
Winston-Salem/Forsyth County
Utility Commission

# Annual Report

## for Fiscal Year 2011-2012

Winston-Salem • Forsyth County
City/County Utilities
Water • Sewer • Solid Waste Disposal

Winston-Salem

WINSTON-SALEM
CITY COUNCIL

Mayor: Allen Joines

City Council:

Vivian H. Burke, Mayor Pro Tempore,
Northeast Ward

Denise D. Adams, North Ward

Dan Besse, Southwest Ward

Robert C. Clark, West Ward

Molly Leight, South Ward

Wanda Merschel, Northwest Ward

Derwin L. Montgomery, East Ward

James Taylor, Jr., Southeast Ward

City Manager: Lee Garrity

Assistant City Manager: Gregory M. Turner

Utilities Director: David K. Saunders

County of Forsyth

FORSYTH COUNTY
COMMISSIONERS

Richard V. Linville, Chairman

Debra Conrad, Vice Chair

Walter Marshall

David R. Plyler

Gloria D. Whisenhunt

Bill Whiteheart

Everette Witherspoon

County Manager: Dudley Watts, Jr.

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Winston-Salem/Forsyth County
Utilitiy Commission
Suite 357, City Hall
101 N. Main St.
Winston-Salem, NC 27101

Published November 2012

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**Utilities Administration**

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Fax 336.727.8432
*www.cityofws.org*

Letter of Transmittal

The Utility Division staff is pleased to submit the *2012 Annual Report of the Winston-Salem/Forsyth County Utility Commission*. This report is the third in a series of annual reports designed to provide educational background related to the utility operations as well as provide information related to the previous year's operational and planning processes. This edition will focus on the rich history of local utility systems; highlight the benefits of the regional cooperation of the Utility Commission partners and customers, and present information about the long range planning processes that are necessary to successfully prepare for the future generations of customer needs.

The replacement of the Salem Lake Dam was the most significant project completed during the 2011-2012 fiscal year. This project replaced the structure that has provided the bulk of the system's water for the last century with a new project, built to modern design and safety criteria that will serve the customers of the system with a reliable, affordable water supply for the next century as well.

A great deal of effort this past year has also been invested in developing a wastewater collection system master plan. The last time a comprehensive collection system planning process was performed was over 40 years ago. The current planning project will result in projects that are intended to serve the wastewater system through planning year 2030 and beyond. These proposed projects are anticipated to demand a significant investment in wastewater infrastructure over the next 10 years in preparation for future service demands.

Thank you for taking the time to review this Annual Report. We hope you find it informative and helpful.

Gregory M. Turner, PE
Assistant City Manager

David K. Saunders, PE
Utilities Director

CityLink311
Call 311 or 336-727-8000
citylink@cityofws.org

# Administration

The Winston-Salem/Forsyth County Utility Commission is an 11-member appointed body that oversees the publicly operated water, wastewater and solid waste facilities that serve Winston-Salem and Forsyth County. All decisions regarding the management of these facilities are delegated to the Commission by the Winston-Salem City Council and the Forsyth County Commissioners. Ownership and the responsibility for the disposal of these assets is the city's, pursuant to the original 1976 agreement that consolidated the city and county utility systems. The commission is responsible for:

- Overseeing the long-range planning, funding, operation and maintenance of water and wastewater treatment, water distribution and wastewater collection, and solid waste facilities;
- Setting rates, charging assessments, and providing improvements and extensions to utilities facilities;
- Reviewing utility extension policies and rate structures;
- Receiving comments and suggestions from the public and holding public hearings concerning matters under the authority of the commission; and
- Approving policies for all publicly owned water, wastewater, and solid waste disposal facilities.

Five members of the commission are appointed by City Council upon recommendation of the mayor; another five members are appointed by Forsyth County Board of Commissioners. The chairperson is appointed jointly by the mayor and the chairperson of the Forsyth County Board of Commissioners.

The commission chairperson serves a two-year term and is limited to five terms. Commission members serve staggered five-year terms and are limited to two terms.

## GOVERNANCE

The Utility Commission has three standing committees:

- The Operations Committee considers items relating to the long-term operation of both the water/wastewater and solid waste disposal programs. Three commission members sit on the Operations Committee.
- The Finance Committee considers items related to the finances of both the water/wastewater and solid waste disposal programs. Four commission members sit on the Finance Committee.
- The Planning and Policy Committee considers changes to policies and procedures for the operation of the water/wastewater and solid waste disposal programs. Three commission members sit on the Planning and Policy Review Committee.

The chairperson of the commission appoints the members of each committee and designates one person as committee chairperson and another as vice-chairperson.

## COMMISSION FINANCES

Funding to operate, maintain and extend water and sewer services comes from grants, water and sewer user fees, assessments, interest earned on the commission's reserve funds, and from revenue bonds issued against the commission's revenue stream. Funds to operate and

The water pump on the square in Old Salem. Learn more about the history of public utilities in Winston-Salem beginning on page 37.

expand the solid waste disposal programs come from tipping fees and special obligation bonds approved by the City Council. The commission receives no financial support from property or sales taxes paid by citizens of Winston-Salem or Forsyth County. The Utility Commission has no authority to issue bonds or incur debts without prior approval from the City Council.

Utility Commission policies provide that capital improvement projects, such as plant expansions, major facility upgrades, transmission mains, outfalls, and pump stations, are funded through user fees charged bi-monthly to customers for water and sewer services. These facilities benefit all customers and therefore, all customers are expected to help fund them. Each year the Utility Commission determines if new projects in these categories should be paid for with generated balances from user-fee funds or financed with new debt.

These decisions are made based on the cost of financing and financial advisement from the city's chief financial officer. The local collection and distribution systems, known as street mains, are funded by the properties that they serve. When new properties are developed, system lines are required to be installed by the developer and subsequently dedicated to the Utility Commission for ownership and operation. When owners of existing properties request service extensions, the extension requests are provided for under the Utility Commission's petitioned programs.

The Utility Commission's policies for setting assessment rates follow the guidance established in the North Carolina general statutes. Each year the commission reviews construction costs from the previous year and sets a new assessment rate designed to recover the cost of a typical installation. New customers benefit from this process in that the rates they are assessed are based on the previous years' actual construction costs and are not adjusted upward for annual inflationary factors. In many cases, customers are not actually assessed for two to three years after the cost of the extension is established, allowing them a considerable discount against the actual cost of installation.

The Utility Commission's sound financial policies and the superior fiscal management of the utility system is reflected in the high credit ratings assigned to the system's revenue bonds. They carry an AAA rating from Standard and Poor's Rating Agency (one of 53 such ratings nationwide); Aa1 from Moody's Investor Service and AA+ from Fitch. High credit ratings allow the commission to sell bonds at lower interest rates when financing capital improvements. Given the projections of capital needs for the next five years, a lower cost of capital will enable the commission to meet those needs with greater savings.

## COMMISSION OPERATIONS

The Utilities Division of the city of Winston-Salem is responsible for all day-to-day operation and maintenance of the water and wastewater treatment facilities and their associated collection and distribution systems, and solid waste facilities in accordance with policies established by the Utility Commission.

The Utilities Division also provides technical and administrative assistance to the commission and is responsible for capital improvements under the direction of the commission. Utilities Division management

| City | No. of Customers | Monthly Charge | Median Household Income | *Cost of Service As % of Median Household Income |
|---|---|---|---|---|
| Durham | 83,584 | $51.91 | $46,972 | 1.33% |
| Charlotte | 263,805 | $45.37 | $52,446 | 1.04% |
| Greensboro | 101,544 | $38.12 | $41,530 | 1.10% |
| Raleigh | 177,000 | $49.54 | $52,219 | 1.14% |
| Winston-Salem | 121,969 | **$34.09 | $41,483 | 0.99% |

### WATER & SEWER RATES FOR FIVE MAJOR MUNICIPALITIES (BASED ON 600 CF MONTHLY)[1]

* According to EPA data, cost of water and sewer are considered affordable if the total cost of service is less than 2.5% of the Median Household Income.

** Calculated using October 1, 2012 rates.

Source: Environmental Finance Center, UNC School of Government

advises the commission regarding policy changes that will benefit citizens and future growth, maintenance and operation of the system.

The operations of the Utilities Division fall under the oversight of the city manager and an assistant city manager.

The Utilities Division and its staff adhere to the same general processes and procedures regarding the operation of its systems as all other departments within the city of Winston-Salem.

The commission's financial assets are managed by the city Financial Management Services department . The city Office of Budget and Evaluation assists with preparation of the commission's budget. Negotiations for property acquisitions are conducted by the city Real Estate Office; the Winston-Salem/Forsyth County Purchasing Department manages all other system asset acquisitions.

The city Engineering Division provides the Utilities Division with design and project management services for main line extension projects. Additionally, due to the specialized nature of the work of division operations and facilities, outside consultants may be enlisted to provide assistance in those areas that are outside of staff expertise.

The City Attorney provides legal assistance to the commission and the Utilities Division when necessary. Major maintenance and repairs of the division's buildings are handled through the city Property Management Division.

## Seeing the bigger picture

### Regional perspective mutually benefits Utilities operations and its customers

The City/County Utility Commission takes pride in providing excellent water and sewer service at rates that are among the lowest in North Carolina and the southeastern United States.

Although careful management and dedicated employees have a lot to do with this, part of the credit also can be attributed to the regional perspective that has informed Utilities operations since 1959, when the city of Winston-Salem put up $1 million toward the cost of building the W. Kerr Scott Reservoir. The reservoir is upstream on the Yadkin River in Wilkes County.

At the time, Salem Lake, the city's traditional source of water, was being used to its fullest extent and to meet demand the city was drawing water from the Yadkin. The water was piped to the R.A. Thomas Water Treatment Plant, which treated water from both the river and Salem Lake.

Knowing that future raw water needs would have to be met by the Yadkin, the city found it prudent to invest in the dam in return for the right to use some of the water in the reservoir. It was a far-sighted move, and one that was shared by city voters: In a referendum on bonds for a variety of city projects, money for the reservoir was the only item that passed.

Seventeen years later, in another far-sighted move, the city and county governments agreed to consolidate their utility operations under the authority of a new, quasi-independent City/County Utility Commission.

A committee to explore a merger of the two systems was first appointed in 1966, in accordance with

## CITY/COUNTY UTILITIES DIVISION PERSONNEL

| | |
|---|---|
| Administration: | 8 |
| Water Treatment: | 54 |
| Water Distribution: | 69 |
| Wastewater Collection: | 63 |
| Wastewater Treatment: | 94 |
| Solid Waste Management: | 35 |
| Technical Support: | 31 |
| Customer Service: | 14 |
| Total: | 367 |

the recommendation of an independent study of how to best meet future water and sewer needs in Forsyth County. However, the committee's efforts stalled amid conflicting views about the details of how the two systems might be consolidated.

Efforts resumed in 1973 and April 1976, the Forsyth County Commissioners and the Winston-Salem Board of Aldermen voted to consolidate their systems under the authority of a new commission, jointly appointed by the two governing boards.

Key to this successful effort was the decision to structure the combined operations as an separate enterprise, supported entirely by user fees rather than taxes. To oversee this enterprise, some of the community's most prominent business leaders agreed to serve on the commission, setting a precedent that continues to this day.

Combining the two systems created economies of scale that make it more efficient to run the commission's water- and wastewater-treatment plants. These efficiencies are reflected in the lower rates that the commission charges.

For similar reasons, the city and county decided in 1988 in that it made sense to consolidate their solid-waste disposal operations under an single authority. Rather than create a new entity, they asked the Utility Commission to add this responsibility to its portfolio.

True to form, the commission agreed not only to take on solid waste disposal, but to adopted a comprehensive waste management program that included recycling and waste-reduction initiatives. The commission also concluded an agreement with the Northwest Piedmont Council of Governments giving other counties in the area access to the landfills; currently, Stokes County takes advantage of this agreement.

In 1996 the Utility Commission's regional perspective expanded again, as it began offering water and wastewater treatment to entities outside Forsyth County. Today, the Utility Commission provides sewage-treatment services to parts of Davie County, the city of King, and parts of north Davidson County. It sells treated water to the towns of Stokesdale and Germanton.

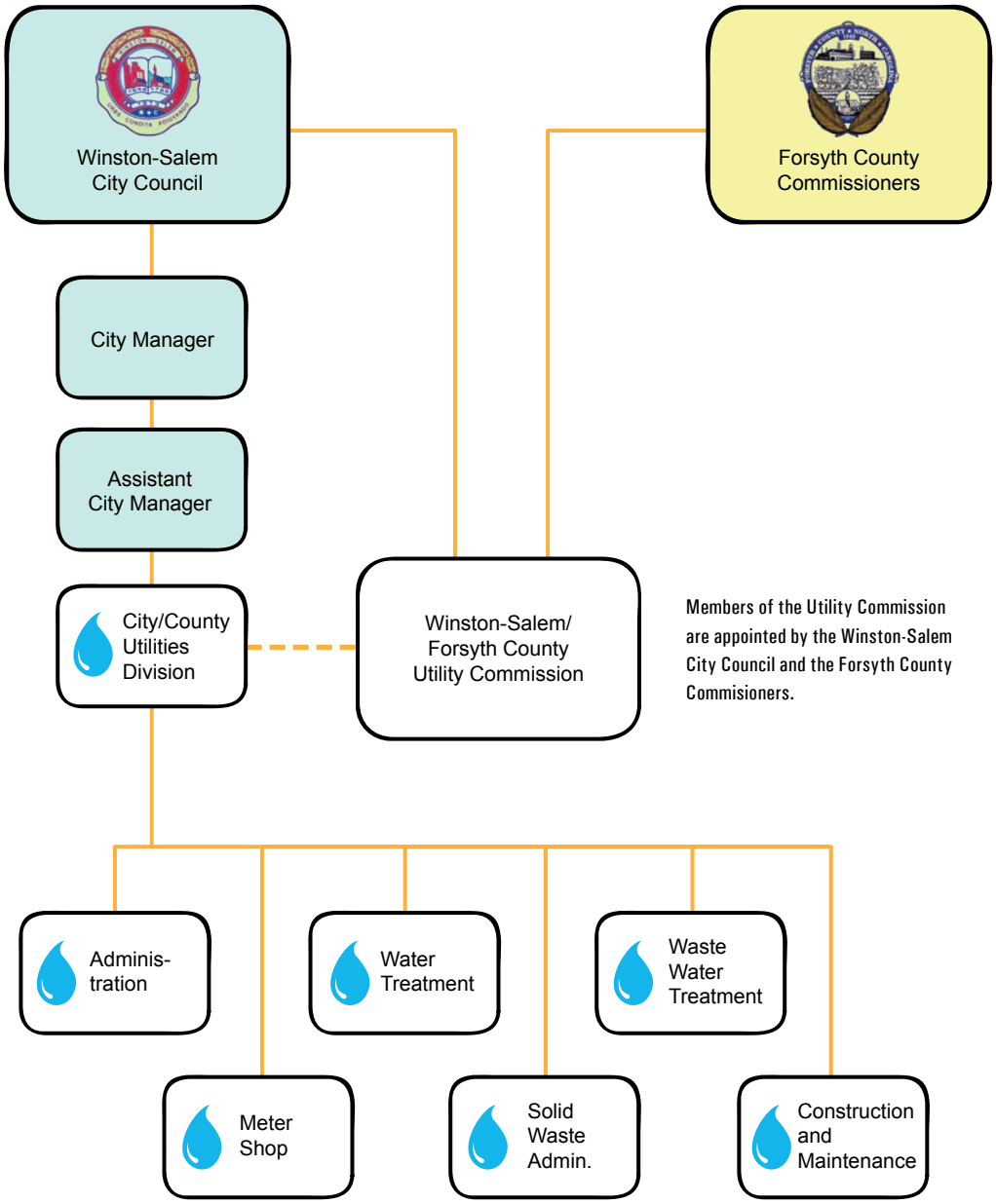
All parties benefit from this arrangement. The outside counties and towns have been spared the need to invest millions of dollars in separate treatment facilities; the Utility Commission has more customers over which it can spread its operating costs, and customers again benefit in the form of lower rates.

(These expansions of service beyond Forsyth County were made possible because of the Utility Commission's ongoing practice of ensuring that it plenty of treatment capacity and raw water resources to meet demand. The resulting excess capacity has enabled the commission to support regional customers.)

In the case of providing sewer service to Davie County, the commission was being doubly prudent: Not only did it gain a new customer to help amortize the cost of its wastewater treatment plants, but it ensured that another entity would not discharge its sewage treatment effluent into the Yadkin River above Forsyth County's raw water intake.

Regional thinking continues to shape Utilities planning. The Swann Water Treatment Plant gives the commission an adequate margin to support additional outside water users, and the South Fork Master Plan, to be completed during FY 2013, will ensure there is adequate sewer capacity to serve the growing Union Cross area between Kernersville and High Point.

# ORGANIZATION CHART




The staff of the City/County Utilities Division are employees of the City of Winston-Salem and provide staff support for the Commission.

# UTILITY COMMISSION MEMBERS

## UTILITY COMMISSION

David Neill, Chairman
James E. Lowe, Vice Chair
Toyoko "Toy" Beaty
Harold E. Day
Charles D. Jewell, II
Harold R. Holmes
Janeen Lalik
Paul S. McGill
Al H. Seymour
J. Hill Stockton
Randall S. Tuttle

## COMMITTEES

FINANCE
Randall S. Tuttle, Chairman
J. Hill Stockton, Vice Chairman
Paul S. McGill
Al H. Seymour

OPERATIONS
Harold R. Holmes, Chairman
Toyoko "Toy" Beaty, Vice Chairman
Harold E. Day

PLANNING & POLICY
Al H. Seymour, Chairman
Janeen Lalik, Vice Chairman
Charles D. Jewell, II

## STAFF

Gregory M. Turner, P.E.
Assistant City Manager

David K. Saunders, P.E.
City/County Utilities Director

# History of the Utility Commission

The Utility Commission was created on April 20, 1976, through a joint consolidation agreement between Winston-Salem and Forsyth County. Under the terms of the agreement, the Utility Commission operates all water and sewer facilities throughout the city and the county under policies established by the commission and subject to the provisions and guidelines of the agreement.

When the agreement went into effect on July 1, 1976, Forsyth County conveyed all real property, equipment, supplies and materials constituting the county's water and sewer facilities, including existing water and sewer lines, to the city of Winston-Salem. The city agreed to pay off, from utility revenues, the county's water and sewer debt-service obligations. These debts were satisfied in FY 1999-2000.

The city and county amended the consolidation agreement in February 1990 to authorize the commission to provide solid waste disposal services and start a source reduction and recycling program. A second amendment, passed in October 1996, authorized the commission to charge customers outside Forsyth County a premium rate for water and sewer treatment services and to set aside half of the rate in excess of the Forsyth County rate in an economic development fund. Additionally, the second amendment allowed members of the Region I Council of Government to have separate contracts with the commission.

A third amendment to the consolidation agreement, approved in January 2003, allows the commission to purchase land with money in the Water and Sewer Utility Fund. The amendment stipulated that any such purchase must be consistent with the Legacy planning guide.

### SYSTEM GROWTH: THEN AND NOW

| | 1976 | 2012 |
|---|---|---|
| **Water** | | |
| Total Water Customers | 54,985 | 122,919 |
| Miles of Water Lines | 1,046 | 2,227 |
| Water Treated Per Day | 29 MGD | 36 MGD |
| Number of Employees | 126 | 162 |
| **Sewer** | | |
| Total Wastewater Customers | 31,385 | 93,684 |
| Miles of Sewer Lines | 690 | 1,708 |
| WW Treated Per Day | 21 MGD | 31 MGD |
| Number of Employees | 134 | 205 |
| **Budget** | | |
| Total Water and Sewer O&M Expenses | $8,554,963 | $61,369,731 |

# Operations

## Water Treatment and Distribution

The Utility Commission operates three water treatment facilities. The R.W. Neilson, P. W. Swann and R.A. Thomas water treatment plants that can treat 48 million, 25 million, and 18 million gallons per day, respectively. These plants draw water from two intakes on the Yadkin River. The Thomas Water Plant, which was recently demolished and rebuilt on the same site, went into service on September 14, 2011. It also draws water from Salem Lake.

During Fiscal Year 2011-12 the water treatment plants combined to treat and pump approximately 13.2 billion gallons of water that met or exceeded all state and federal standards for drinking water quality. This accomplishment reflects the quality and dedication of the employees who work year-round to provide safe drinking water to their customers.

The system serves a population of 312,773 with a water distribution system that includes 2,227 miles of water distribution mains, 14 water tanks and seven pumping stations.

### Facility Upgrades

The Utility Commission continues to invest in its dams, raw water pumping stations, water treatment facilities and distribution infrastructure to improve their efficiency and operation. During FY 2011-12 more than five miles of new main lines were added to the system that provides treated water to a large portion of Winston-Salem and Forsyth County. In addition, 50,002 feet of water lines, 800 connections and 227 valves were replaced.

Maintenance and repair of the existing systems assure our customers that all components of the infrastructure are in proper functioning condition. During FY 2011-12, several water treatment and distribution improvement projects were implemented to provide reliable service to Utility Commission customers for many years to come. Significant projects include:

- Salem Lake Dam Replacement
- Chitty Pumping Station Electrical Improvements
- WSSU Distribution Improvements
- Westbend Hydraulic Improvements
- Cooper Road Water Extension

Details about these projects can be found in the Capital Improvements section of this report.

## Wastewater Collection and Treatment

The Winston-Salem/Forsyth County Utility Commission operates two wastewater treatment plants. The Archie Elledge and Muddy Creek wastewater treatment plants have a combined treatment capacity of 51 million gallons per day. The collection system includes approximately 1,708 miles of sewer lines, 49 pumping stations and three chemical odor control stations. The Utility Commission and the Utilities Division staff work hard to meet or exceed the requirements mandated by the North Carolina Clean Water Act that regulate the collection system

Elledge Wastewater Treatment Plant

operations, and the National Pollutant Discharge Elimination System (NPDES) permits that regulate the operation of the treatment plants and the disposal of biosolids.

## Wastewater Treatment Plants

During FY 2011-12, the sewage plants treated 11.29 billion gallons of wastewater. The Archie Elledge and Muddy Creek wastewater treatment plants and the biosolids drying facility operated all year within the parameters established by state and federal permits. By removing 97.2 percent of regulated pollutants they received, the commission's two wastewater treatment plants far exceed state and federal requirements. Approximately 26,716 tons of regulated pollutants were removed by the treatment processes during the period ending June 30, 2012.

The treatment and disposal of residual biosolids produced by the wastewater treatment plants is accomplished by anaerobic digestion followed by further processing at the biosolids drying facility.

Methane, one of the longest-lasting greenhouse gases, is captured in the treatment process before it escapes to the atmosphere. Each year more that 212 million cubic feet of methane is captured from the digesters and used as fuel to reduce the cost of running the plants.

The biosolids drying facility at the Elledge plant uses excess methane from the existing treatment process to dry dewatered biosolids into a pellet much like granular fertilizer and marketed commercially as Winston-Salem Soil Solution. During FY 2011-12 the dryer produced 5,811 dry tons of pelletized biosolids. The biosolids are beneficially reused in various agricultural settings through a contract marketing/hauling company.

During FY 2011-12, several wastewater treatment improvement projects were implemented to provide reliable service to Utility Commission customers for many years to come. Significant projects include:

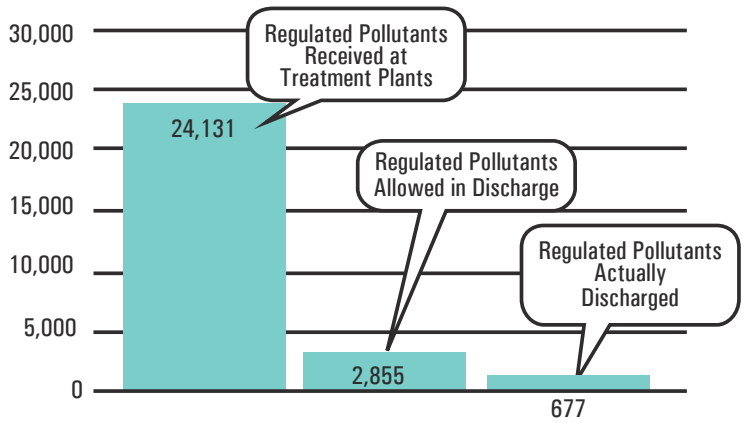
- Muddy Creek Clarifier Improvements
- Kernersmill Lift Station Improvements
- Reedy Fork Lift Station Relocation
- Muddy Creek WWTP Screw Pump Replacement

Details about these projects can be found in the Capital Improvements section of this report.

## Wastewater Facilities Master Plan

A wastewater facilities master plan was developed in 2004 to provide a forecast for capital improvement needs at the treatment plants and lift stations over the next five years. During 2009 and 2010, Utilities revised this plan to forecast improvements needed over the next 20 years. Such factors as future regulations, capacity, wastewater flow projections and infrastructure condition were considered in the developing the revision. The improvements identified were then prioritized to comply with existing and future regulatory requirements, to maintain facility reliability throughout the planning period, and to accommodate growth within the service area.

Although sewer flows are projected to increase, new treatment capacity is not expected to be




**WASTEWATER TREATMENT PLANT EFFICIENCY**

Tons of Pollutants per Year - FY 2011-2012

needed until 2020.

One of the significant factors that the master plan considered is the potential need to modify the treatment plants to remove nutrients from their effluent. The need for nutrient removal stems from the North Carolina Division of Water Quality's decision to list High Rock Lake as impaired by chlorophyll and turbidity. Chlorophyll is formed by microbiological growth that results from excessive amounts of nutrients (nitrogen and phosphorus) in the water. The sources of these nutrients vary but are mostly due to point-source discharges, such as wastewater treatment plant discharges, and non-point sources such as run-off from farms and golf-courses. Turbidity is a measure of the clarity of the water. Erosion increases turbidity and impairs water by preventing sunlight penetration and increasing sediment deposition. Once a water body is listed as impaired, the Division of Water Quality is required by the U.S. Environmental Protection Agency to issue a Total Maximum Daily Load limit. This limit determines how much contaminant load the water body can naturally assimilate. The limit would affect the commission's wastewater treatment plants because they discharge into the Yadkin River, which empties into High Rock Lake.

In light of this, the staff met with the Division of Water Quality to discuss target limits for both nitrogen and phosphorus that could be required in future NPDES permits. These potential limits for nitrogen and phosphorus were used in the master planning effort to determine nutrient removal processes that could be implemented at the Elledge and Muddy Creek plants.

The NPDES permits for both treatment plants are renewed every five years; the current permits are scheduled to be renewed in 2014. In September 2011, staff again met with the Division of Water Quality to discuss any changes that might be required to renew the permits. After this discussion the director of the Division of Water Quality indicated that "stringent limits are not likely to be in place by 2014." However, it is likely that the division would require an optimization study of the existing facilities to reduce nutrient loading. Based on these discussions, the Utilities Division staff anticipates that the 2014 permits will not impose nutrient limits for nitrogen and/or phosphorus; this would postpone a major capital expenditure to construct nutrient removal processes at both wastewater treatment plants. However, more restrictive effluent limits on our treatment permits are anticipated before 2020.

The final report provides prioritization and planning level descriptions and cost estimates for the recommended improvement projects for 5-year, 10-year, and 20-year planning periods and is reflected in current as well as future capital plans presented to the Utility Commission.

## Wastewater Collection

The Utility Commission oversees the third-largest collection system in North Carolina and the Utilities Division has 62 employees dedicated to operating and maintaining the system. More than 99.99% of the wastewater generated by the system's customers was collected and delivered to the treatment facilities. Despite the staff's best efforts, sanitary sewer

Elledge Wastewater Treatment Plant Lab

overflows will occur. Most overflows occur when sewer lines are obstructed or their capacity is reduced due to inflow or infiltration of ground or surface water.

## Wastewater Collection System Permit Compliance

The Utilities Division has been operating under a Wastewater Collection System Permit issued in August 2005. This permit sets requirements on system performance, operations, maintenance, record keeping, monitoring and reporting, and inspection expectations that have immediate impact on the commission's operation. The permit also requires that system owners and operators demonstrate that a proactive and preventative maintenance program is in place to eliminate overflows.

The Utilities Division has spent significant effort refining preventive maintenance programs. In 2008, three different preventive sewer line maintenance contracts were put in place: chemical root control, hydraulic and mechanical cleaning of sewer lines, and right-of-way maintenance. Each maintenance contract can be renewed annually for up to five years. These contracts will supplement our staff resources and help achieve the goals required in the permit.

Since July 2008 the commission has funded a separate crew responsible for cleaning large diameter mains. These large sewer mains carry large volumes of flow and over time have a tendency to accumulate sediment and other deposits that reduce their capacity. This crew uses specialized equipment for lines 18 inches and more in diameter. This equipment removes sediment and cleans the lines, thus restoring their capacity. This operation is just one of the preventative maintenance activities the commission has implemented to reduce sewer overflows.

During 2008, the North Carolina Division of Water Quality began issuing Notices of Violation for sewer overflows that reach surface water or exceed 1,000 gallons. The division may levy penalties for any overflow that it deems to have been preventable. In FY 2011-12, our system received 62 notices, with four overflows listed as "Intend to Enforce" actions that would incur penalties. Staff provided follow-up information on all four incidents and division was satisfied with our efforts to prevent sewer overflows. As a result, the Utility Commission was not assessed any civil penalties for sewer overflows during FY 2011-12.

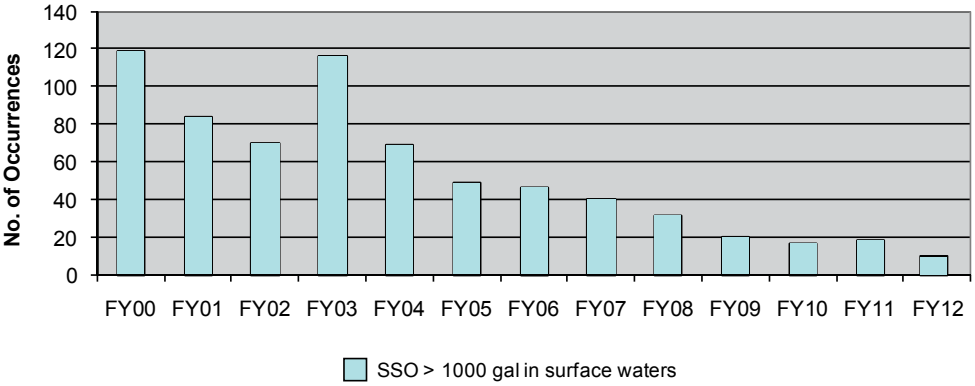
The Utilities Division staff has a reduction team that meets on a regular basis to identify projects to reduce overflows as well as infiltration and inflow into the sewer system.

Even with the current budgetary restrictions in place, meeting the requirements for the collection system permit is the commission's highest priority. It has required the implementation of new programs, the use of external contractors and the hiring of additional personnel for annual inspections, preventive maintenance programs, system monitoring, recordkeeping, and rapid response when an overflow occurs.

## Overflow Reduction Efforts

Since the passage of the North Carolina Clean Water Act in 1999

## PERFORMANCE SUMMARY OF SEWER COLLECTION SYSTEM




the total volume of annual sewer overflows has been tracked against the baseline year of FY 1998-99. For FY 2011-12, the total volume of sewer overflows represents a 95.8 percent decrease from the volume reported for the baseline year.

There were a total of 117 sewer overflows during FY 2011-12, a 7.3 percent increase compared with the 109 overflows reported in FY 2010-11. These overflows totaled 65,273 gallons, a 31.5 percent decrease from the 95,342 gallons reported in FY 2010-11. These overflows accounted for only 0.0006 percent of the 11.29 billion gallons of wastewater the system collected during FY 2011-12. The goal, however, is to have zero sanitary sewer overflows from the sewer collection system.

During the fiscal year there were 18 overflows of 1,000 gallons or more in the sanitary sewer collection system. In addition, there were four overflows from treatment plants that reached surface waters, totaling 1,930 gallons, or 0.00002 percent of the wastewater treated.

The accumulation of fats, oils, and grease in sewer lines can cause blockages in the collection system. Forty-four of the 117 sanitary sewer overflows in the collection system during FY 2011-12 were attributed to grease accumulation. This is a reduction in grease-caused overflows over previous years and reflects the continued effectiveness of the commission's Grease Interceptor Ordinance (in place since 2003) and public education efforts. For example, staff, working with the city's Marketing & Communications Department, developed a "Can the Grease" brochure and associated educational materials. This information is routinely provided to the public at functions throughout the year. The reduction also reflects the proactive approach to cleaning sewer main lines and the publicly maintained portion of sewer connections. Sewer-line maintenance also prevents overflows due to the intrusion of tree roots and debris, which are the other major contributors to line blockages.

In summary, the wastewater collection system staff continued to operate the system in compliance with the permit. Improved operational performance was key in minimizing the total volume of sewer overflows. Although effort is currently being placed on operational performance and major system improvement projects, more effort will be required to meet the goal of zero overflows. As a result, more staff, equipment, information technology, and funding will be required to ensure success.

### Wastewater Collection System Maintenance and Rehabilitation

During FY 2011-12, Utilities Division personnel cleaned 712,331 linear feet of sewer mains. The commission spent $206,986 to have contractors clean an additional 302,644 linear feet of sewer lines. The cleaning contract will remain the same for next fiscal year in an attempt to continue to reduce sanitary sewer overflows related to debris and grease. In addition, a chemical root control contract provided for the treatment of approximately 110,000 linear feet of sewer mains in FY 2011-12, further reducing the risk of sanitary sewer overflows occurring in the system.

Also, the commission funded the inspection of 119,075 feet of sewer mains using closed-circuit TV. Staff

**TABLE 1**

**Annual Tonnages at Hanes Mill Road Landfill**

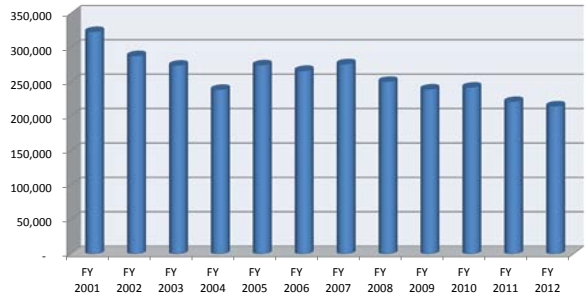
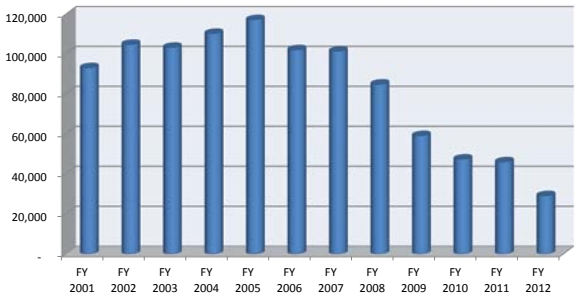



**TABLE 2**

**Annual Tonnages at Old Salisbury Road Landfill**




and contractors also improved the access to collection system easements through the inspection and mowing and clearing of approximately 55 miles of easements.

During FY 2011-12, the commission invested more than $6 million in sewer main rehabilitation projects. These projects replaced older, less reliable infrastructure with newer sewer lines, resulting in fewer leaks and service interruptions. These improvements corrected problems such as cracked pipes, misaligned joints, sagging lines, and root intrusion.

The majority of the rehabilitation projects included rehabilitating or replacing approximately 80,456 feet of gravity sewer mains, 253 manholes, and 891 service laterals. Most of the rehabilitated sewer mains ranged in size from 6 to 12 inches and took place in the following areas:

- Ardmore Basin 10
- Lockland Ave to Brent Street
- Muddy Creek sub-basins L3B-1 & L5B-9
- 21st Street
- Inverness Street-Okalina Street area
- Nancy Street area

## Solid Waste

The Solid Waste Management program is responsible for operating the Hanes Mill Road Landfill, the Old Salisbury Road Construction and Demolition Landfill, the Reynolds Park Road Leaf Composting Facility, and Forum 52 and Overdale Yard Waste facilities. This program is also responsible for various other recycling and waste management efforts, including scrap tire and white goods recycling, recycling in the Winston-Salem/Forsyth County school system, and a program that diverts household hazardous waste from landfill disposal.

All programs are operated to meet or exceed regulatory standards, environmental protection criteria and to deliver services as efficiently as possible. The majority of programs are operated directly by Utilities Solid Waste staff, a group of 35 professional, technical and operational employees. Contractors are used for select services to achieve greater efficiency and effectiveness.

The Solid Waste Management program managed more than 269,191 tons of municipal solid waste, construction and demolition debris, and yard waste during FY 2011-12. Recycled materials included 6,339 tons of scrap tires and 282 tons of appliances. The facilities served an average of 434 vehicles per day for a total of more than 127,789 vehicles during the year, down from the previous year by 8,243 vehicles.

The trend of increasing amounts of municipal solid waste being hauled out of Forsyth County (for disposal in privately operated landfills) continues. To help mitigate this trend, and assure adequate revenues, the City/County Utility Commission has not raised tipping fees at CCUC disposal facilities and continues to offer discounted tip fees for higher volume customers. Waste quantities are also affected by economic factors, as waste generation generally declines during an economic recession. Table 1 illustrates the fluctuations in the municipal solid waste stream over 10 years.

The waste stream at the Old Salisbury Road construction and demolition landfill has declined

Hanes Mill Road landfill

more significantly than the general waste stream in the last 10 years. This decline is believed to be primarily due to economic conditions, although there is now a privately operated construction and demolition recycling facility located in Forsyth County that receives some of the waste that previously went to the Old Salisbury Road landfill. In FY 2011-12, 29,089 tons were received at the landfill, a decrease of 16,925 tons from the previous year's total of 46,014 tons. Table 2 shows the declining trend in C&D waste.

## STATUS OF SOLID WASTE PROJECTS

### Hanes Mill Road Landfill

The original portions of Hanes Mill Road Landfill date to the 1970's and are located on the east side of the railroad tracks that bisect the site. The oldest portions consist of approximately 70 acres of unlined area, with another 40 acres of lined cells immediately adjacent to the original unlined area. Permits were issued for a newer lined expansion area in the early 2000's, across the tracks to the west of the original landfill. The first cell of this expansion was placed into use in May 2005. A second, 14-acre lined cell (adjacent to the initial 22-acre cell) was completed in late 2006, and began receiving waste in April 2007. The construction of cells 3 and 4 began in late 2010, and was completed in late 2011. This added 17 acres of lined landfill cells to the 35 already constructed, for a total of 52 acres. The complete permitted landfill footprint will encompass about 90 acres, and is expected to provide landfill capacity for 20 or more years, depending on how much waste is received at the facility.

### Landfill Gas System

The Hanes Mill Road Landfill has a landfill gas extraction system that collects gas generated by the decomposing waste. The gas is delivered to a power generation facility where it is converted into electrical power and sold back to the power grid. The power plant is operated by a contractor, DTE Biomass, operating locally as Salem Energy. More than 36 million kilowatt-hours of electricity are generated annually -- enough electric energy to power 2,900 homes. Under its contract, DTE purchases the gas harvested from the landfill. A portion of the proceeds from the gas sales is invested in the solid waste enterprise fund, and over time these payments will offset the capital cost of installing the system components and operational costs of complying with air quality regulations.

### Construction and Demolition Debris Management

The Old Salisbury Road C&D Landfill has adequate capacity to serve the community for many years to come. The declining construction waste stream makes specific projections uncertain, but at current waste levels the landfill should easily last through 2025. The extended life of this facility and the presence of another C&D facility in the county provides adequate time to conduct strategic planning and analysis of the various options for managing this waste stream. Some of these options include: developing a new

landfill and recycling facility; implementing recycling programs on existing sites; partnering with others in the recycling industry; and/or co-disposing this waste stream at Hanes Mill Road Landfill.

## Future Challenges And Opportunities

The solid waste funding structure has historically relied primarily on tipping fees at its facilities to fund its operations, and to generate a fund balance to cover future capital expenditures. In light of reduced revenues due to the declining waste stream in recent years, this funding model is being re-examined. The waste stream at Hanes Mill Road Landfill has been reduced partially because the amount of waste hauled outside the county by private waste haulers has increased; but the waste stream overall has declined due to economic conditions.

For more than 15 years, the Solid Waste Enterprise Fund provided full funding for the city's curbside recycling program, Forsyth County's drop-off recycling program, and (since 2002) the recycling program in the Winston-Salem/Forsyth County public schools; while also covering all costs for its other solid waste management facility operations. In response to declining revenues in the solid waste fund, during budget year 2010-11 alternative approaches were implemented for some of the recycling programs. These alternative approaches included joint funding of the household hazardous waste program by the Water, Sewer, and Stormwater enterprise funds. Other changes included the start of shared funding with the city of Winston-Salem for the cost of the city's curbside recycling program; and shared funding with Forsyth County for the cost of drop-off and school recycling programs. Initially the city and county contributed 20 percent while the solid waste fund contributed 80 percent.

In fiscal year 2011-12, the contributions from the city and the county toward their recycling programs increased to 40 percent. This alternative funding approach is intended to reduce the pressure on the solid waste fund caused by declining revenues. With the assistance of the Budget Office, Utilities staff continue to monitor both operating and capital expenses in an effort to discover and implement cost saving measures to further improve our fund balance. Staff also continue to monitor overall economic conditions that drive the composition and magnitude of the waste stream in order to respond appropriately to future changes that impact our financial performance.


Overdale scalehouse

Other challenges and opportunities for the solid waste program are driven by state and federal regulatory changes. New statewide waste disposal taxes and funding mechanisms provide additional revenue but add to administrative and overhead costs. The disposal tax implemented in 2008 provided $203,979 revenue in FY 2011-12, compared with $487,791 remitted to the state. The ban on electronics and televisions that came into effect July 1, 2011, resulted in an additional $52,616 in costs for recycling those items. The state electronics fund provided $27,215 to offset some of those costs. New EPA regulations for greenhouse gas reporting have increased costs of compliance with air quality permits. Finally, new stormwater requirements issued by the N.C. Division of Water Quality for the three compost facilities could result in significant additional expenses in the future.

The Utility Commission is evaluating ways to make the total solid waste disposal system more efficient while continuing to provide excellent customer service and environmentally sound programs. In 2010, a comprehensive study of this community's solid waste programs was conducted and the study's recommendations continue to be discussed.

During FY 2011-12, the Ten-Year Solid Waste Management Plan for Forsyth County and all its municipalities was revised and adopted. This plan documents ongoing waste management practices, tracks and establishes waste reduction goals, and identifies action items for the future that are intended to continually improve our solid waste management programs.

# Capital Improvements

The Utility Commission maintains an ongoing capital improvements program for its water and wastewater treatment plants and its collection and distribution systems to ensure that all commission facilities operate efficiently and within the requirements of state and federal regulations. The commission's capital improvements program is guided by masterplans that look at such factors as future regulations, capacity, population growth, commercial and industrial growth, wastewater flow projections and infrastructure condition. Capital improvements identified through these masterplans are then prioritized by fiscal year. During FY 2011-12, the commission's budget for capital improvements totaled $46.8 million. Details about major projects are listed below.

## Water Treatment and Distribution Projects

### Cooper Road Water Extension

This project extended a water main from the intersection of Cooper and Loop Roads, near Clemmons, to the Muddy Creek Wastewater Treatment Plant. When the new main was built, an existing service connection for the Muddy WWTP was severed on the 48-inch water main leaving the Neilson Water Treatment Plant. The connection off the new water main provides additional chlorine contact time prior to delivery to the customer as required by state regulations. Extending this main will also allow future domestic connections along Cooper Road. The project was awarded in April 2011 and was completed in May 2012. The project budget was $305,851; expenditures through FY 2011-2012 totaled $248,027.

### Idols Dam Repairs

The Idols Dam plays a vital part in the Winston-Salem/Forsyth County water system by providing a pool of water for the intake structure along the Yadkin River just upstream from the dam. The Idols Dam has been in service since 1892.

There are several areas of concern with the structure, including erosion along the stream bank, sediment deposits at the trash rack, erosion and undermining at the retaining wall, and deficiencies in the masonry weir. A recent evaluation of the structure noted these areas of concern and alternatives for repairs. This project includes making the recommended repairs to preserve the dam and surrounding areas. Corrective measures will protect the integrity of the dam structure as well as the intake pool area for many years into the future.

This project is currently in the design phase and construction is expected to begin in mid 2013. Total proposed budget: $2,410,000. Expenditures through FY 2012 total $104,258.

### Salem Lake Dam Replacement

The Salem Lake dam was built in 1919 to create a reservoir to supply

Salem Lake Dam Replacement Project

the treatment plant that previously occupied the site of the Thomas Plant. The dam was raised in 1921, 1931 and 1947 to increase the lake's capacity. Other improvements included addition of a three-story pump house in the central portion of the dam around 1931; in 1996 concrete on the downstream face was replaced with a structural overlay to match the 1947 crest elevation.

A 2007 engineering evaluation and analysis of the dam found no immediate concerns relative to public safety but confirmed that the dam did not meet current standards for spillway capacity, lake draw down, and downstream energy dissipation. An engineering analysis recommended replacement of the dam as the more cost-effective solution. This project includes the pre-design, design, and construction of a new dam, and relocation of a portion of the Salem Lake Trail to accommodate construction of the dam. While under construction, the level of Salem Lake has been lowered 12 feet. This allows the lake to absorb a 10-year storm without overflowing the construction site. The lake was closed to fishing and boating while the level was lowered.

Design work was completed in FY 2010. A celebration of the dam's completion was held Oct. 15, 2012. The project's total budget is $11,900,000. Expenditures at the end of FY 2012 totaled $7,374,077.

## Chitty High Service Pumping Station - Standby Power and Electrical Improvements

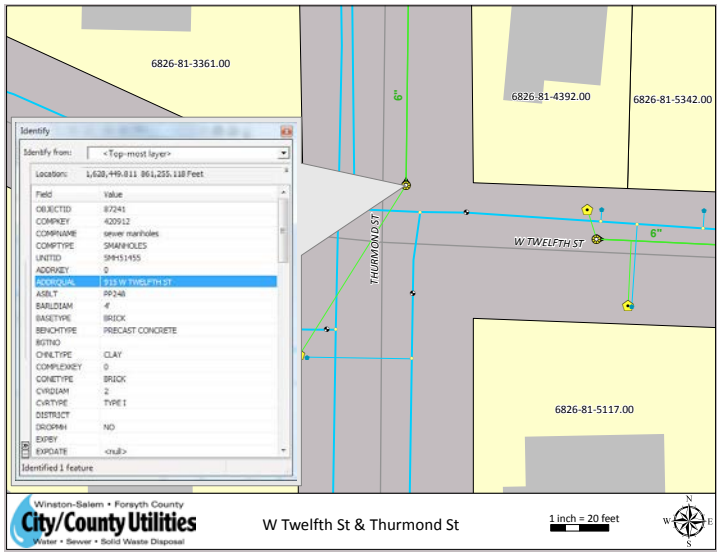
The Chitty High Service Pumping Station comprises two pumping stations. The oldest station, built in 1961, has operated for more than 49 years with little capital investment. The equipment has aged beyond its useful life and the lack of available replacement parts has rendered the equipment difficult to maintain. The 1986 pumping station has been in continuous service for 24 years and some capital improvement is needed to replace aging equipment and maintain the reliability of the station.

Under this project the existing electrical substation will be replaced. New standby power generators will be provided for the stations. New equipment will include 4160V switchgear and generators, 480V generators, fuel storage tanks and transformer. The existing diesel-driven pumps will be removed from service and emergency power will be provided by the new equipment. The 49-year-old motor-control center will be replaced with a new 4,160V motor-control center and new starters will be installed.

Due to changes in the distribution system since the station was put in service, the pumps have experienced abnormal wear. Based on an evaluation of the current and projected water demand, the number of pumps will decrease from eight to five. All of the new pumps will be located in the 1961 station and the 1986 building will house the new generator and switchgear. This project is currently in the design phase and construction is expected to begin mid FY 2013. Total project budget: $7,598,160. Total expenditures through FY 2012: $654,978.

## Water Distribution System Improvements

This project provides multiyear funding for water distribution improvements throughout the city




Example of GIS data collection

and county. This project will fund some planned work such as valve exercising as well as unanticipated miscellaneous projects that arise throughout the fiscal year, such as projects for rehabilitation portions of the water system, chlorination booster projects, structure adjustments, system-wide asset replacement planning, and other miscellaneous water system improvements.

Total budget: each year: $1,000,000. Expenditures through FY 2012 total $0.

## Two-inch Water Main Replacement

This multi-year project will replace 2-inch water mains at approximately 30 locations within Winston-Salem, Rural Hall, Walkertown, and Kernersville. These lines are undersized and no longer provide adequate domestic flow or fire flow to the areas they serve. Two-inch water mains are being replaced with 6- or 8-inch mains. Through FY 2012, 20 locations have been upgraded. During FY 2012, projects were completed for areas in Rural Hall and Walkertown, totaling 6,447 feet of replacement lines. Total expenditures for FY 2012: $388,048.

## Ardmore Area Water and Sewer Rehabilitation

This project provides for the evaluation and rehabilitation of the Ardmore neighborhood water and sewer systems. Due to the large size of the Ardmore neighborhood, the age of the water and sewer systems, and the historical aspects of the area, a master plan approach is being pursued in developing an overall project approach for the rehabilitation of these systems. The Ardmore area has been divided into 12 sub-basins and the master plan has prioritized each area to develop the overall project plan and budget.

The first construction phase of the project addressed immediate repair needs across the entire Ardmore basin and was completed in FY 2011. During FY 2011-12, construction in Ardmore Basin 10 was completed. Design work is currently underway on a portion of Basin 11 utilizing unspent design funds from Basin 10. Total project budget: $35,582,600. Expenditures through FY 2012: $5,704,203.

## Water & Sewer GIS/ Asset Management

This project will create a new Geographical Information System mapping and database of the water and sewer systems. The GIS mapping will utilize Global Positioning System technology to tie existing mains and manholes to a current GIS datum. The project includes the cost to collect data on the water and sewer systems. Once complete, the database will be used for capital improvement planning, maintenance planning and scheduling, and storing information on existing systems. The systems will combine data from other agencies (e.g., Tax Office, Planning, Engineering, etc.), which will allow maps to overlay other various facets of information on top of the water and/or sewer systems.

To date information has been collected on 7 percent of our asset inventory. Total proposed budget: $3,883,400. Expenditures through FY 2012: $353,600.

Sewer line replacement on Irving Street in the Ardmore Neighborhood.

## 21st, 22nd, & 23rd Street Rehabilitation

The scope of this project includes the complete rehabilitation of existing water and sewer lines on 21st, 22nd, 23rd, and surrounding streets. The project limits include streets within the boundaries of Liberty Street to the west, 25th Street to the north, Bowen Boulevard to the east and 14th Street to the south. The project is being designed and constructed to address sewer and water system issues that have resulted in sanitary sewer overflows and a high volume of work orders for maintenance staff.

The project includes engineering design, easement acquisitions, construction, and construction management. Construction is scheduled to begin in FY 2013. Total project budget: $15,906,360. Expenditures through FY 2012: $280,243.

## Winston-Salem State University Distribution System Improvements

This project will eliminate encroachment of a 24-inch water main easement on the Winston-Salem State University campus and ensure quality of service provided by the Thomas Water Treatment Plant's transmission mains. The project is being completed in two phases, replacing/relocating approximately 10,670 feet of transmission mains that range in size from 12 to 24 inches. Construction of phase one was completed in May 2010 within budget. Phase 2 includes replacement of a 30-inch water line and is on schedule for award of a construction contract in FY 2013. Construction is expected to be completed a year after contract award. Total budget: $4,780,860. Expenditures through FY 2012: $1,614,554.

## West Bend Hydraulic Upgrades

This project replaced approximately 12,630 feet of 6-inch distribution water mains along Shallowford Road with new 12-inch mains to increase the flow for customers previously served off portions of Hauser Road, within the Montrachet Development and within Nanzetta Way and Slater Road. The need for this project became apparent after pressure and flow testing the installation of new water mains within Nanzetta Way and Slater Road. The tests resulted in residual pressures and flows that fell below a level that is considered to be adequate for customers to receive service. Water modeling of this area of the distribution system concluded the most cost effective solution was to replace two segments of 6-inch main with a 12-inch main along Shallowford Road. One segment of 9,047 feet was installed from Arrow Leaf Drive to Hauser Road. The other segment was 2,396 feet between Dorse Road to Slater Road.

Construction for this project was completed in FY 2012. Expenditures through FY 2012: $730,353.

Existing primary clarifiers at Muddy Creek Wastewater Treatment Plant to be upgraded in current project.

# Wastewater Collection and Treatment Projects

## Muddy Creek Wastewater Treatment Plant Rehabilitation and Upgrades

This project provides multiyear funding for general building, grounds, and equipment maintenance for the Muddy Creek Wastewater Treatment Plant. The project provides for the purchase of costly replacement parts and repairs that are needed for the continuous operation and maintenance of the plant.

During FY 2012, the need was to replace one of the 84-inch screw pumps in the influent pump station that is at the end of its useful life and the replacement of three blowers that provide air to the aeration sludge basins. The scope also included replacement of the four anaerobic digester gas accessories and cleanout of the digesters. Replacement of the digester components is needed because of their age and exposure to the corrosive digester gas. This particular project is expected to be closed out early 2013.

Total project multiyear budget: $14,327,000. Expenditures spent on the 84-inch screw pump project through FY 2012 were $587,021.

## Muddy Creek Wastewater Treatment Plant Clarifier Improvements

This project includes the replacement of sludge scraper equipment, the addition of baffles, construction of one new secondary clarifier, and the addition of return activated sludge pumping capacity at the Muddy Creek wastewater treatment plant.

The sludge scraper equipment in the existing primary clarifiers will be replaced with scrapers that can be operated independently for each clarifier unit. Although there are four separate clarifier units, the existing bridge-type scrapers operate in pairs so that a shutdown for maintenance or any other reason removes two of the four clarifiers from service. This negatively affects the loading and performance of downstream processes and the overall reliability of the entire wastewater treatment plant. The upgraded units will allow greater reliability within the existing clarifiers.

This project also includes an evaluation of the performance of the existing secondary clarifiers and return activated sludge pumping system at the Muddy Creek plant. The existing secondary clarifiers experience performance issues as flow increases even when flow is well within normal loading guidelines. Dye testing and velocity measurements will be conducted to identify the specific issues that may be correctable with the installation of baffles within each clarifier.

In addition, the return activated sludge pumps currently cannot pump at their designed capacity. The shortfall is suspected to be caused by excessive suction side headloss. The source of the excessive headloss was investigated during the clarifier study. This project is currently in the design phase and construction is expected to begin in mid 2013. Total project budget: $13,195,250. Expenditures through FY 2012: $687,590.

Wastewater samples to be analyzed at the Manson Meads laboratory.

## Kerners Mill Lift Station Upgrade Project

The Kerners Mill lift station, originally built in 1981, has served for more than 30 years without any major upgrades or improvements. The project includes the replacement of pumps and other electrical components that are obsolete and difficult to maintain. The existing generator will be upsized to run the controls and both wastewater pumps during a power outage. A contract for the improvements was awarded in March 2012 and construction is expected to be completed in FY 2013. Total proposed budget: $1,594,727. Expenditures through FY 2012: $184,385.

## Reedy Fork Lift Station Relocation

The Reedy Fork lift station was conveyed to the Utility Commission under the terms of a 1996 agreement with the Town of Kernersville. The pump station is located on an abandoned wastewater treatment plant site just inside Guilford County and next to Triad Park.

The pump station was built in 1982 and is in poor condition. Outdated equipment has made it difficult to obtain replacement parts and perform necessary maintenance and repairs. The station is a confined space and requires additional time, safety measures, and costs when inspections and repairs are performed. In addition, a portion of the outfall supplying flow to the pump station traverses upstream wetlands that are a significant source of infiltration and inflow. The scope of this project includes decommissioning of the existing pump station, designing and constructing a new pump station upstream of the wetlands, and conducting a downstream hydraulic capacity study of the wastewater interceptors in the South Fork sewer basin.

The project is in the design phase and has a budget of $10,252,860. Expenditures through FY 2012: $763,834.

## Wastewater Collection System Improvements

This project provides multiyear funding for inspection, evaluation, design, and construction of sanitary sewer rehabilitation projects throughout the wastewater collection system. In many areas of the sewer system, the pipes and manholes are 60, 70, or 80 years old and have exceeded their design life. Manholes have deteriorated and pipes have cracked and broken. These problems cause backups, cavities/voids underground, flow problems, and infiltration/inflow and result in sanitary sewer overflows and extra cost at the plants for treatment.

During FY 2011-12 79,897 linear feet of sewer pipe and 239 manholes were rehabilitated. Total budget each year: $3,000,000. Expenditures during FY 2012: $2,079,883.

## Muddy Creek Basin Find and Fix

This project provides for inflow and infiltration investigations, flow monitoring, planning, design, and construction for sewer rehabilitation projects in the Muddy Creek sewer basin. This project should decrease the amount of inflow and infiltration entering the system and increase its long-term capacity.

Total proposed budget: $20,210,020. Expenditures through FY 2012: $3,892,630.

Aerial Crossing/Stream Restoration before (above) and after (right).

### Aerial Crossing/Stream Restoration

This project was developed to address the repair of water and sewer mains crossing streams. These lines were either aerial during initial construction or have become exposed due to natural streams meandering and changing direction. The changes in stream patterns make the utility lines vulnerable to damage by debris flowing in the streams and expose manholes and piers so they are no longer structurally sound and subject to collapsing into the streams. This project will replace or repair damaged structures, relocate mains and structures and restore streams at multiple locations identified through various investigative methods and maintenance records.

The project is currently under construction and is scheduled to be completed November 2012. Total project budget: $2,997,500. Expenditures through FY 2012 total $1,534,518.

## Planning for the Future

Winston Salem/Forsyth County Utility Commission is currently updating its Wastewater Master Plan, formerly known as the 201 Wastewater Facilities Plan, to account for the demands of growing population, industrial and commercial development, and aging infrastructure that will be placed on its wastewater collection and treatment system.

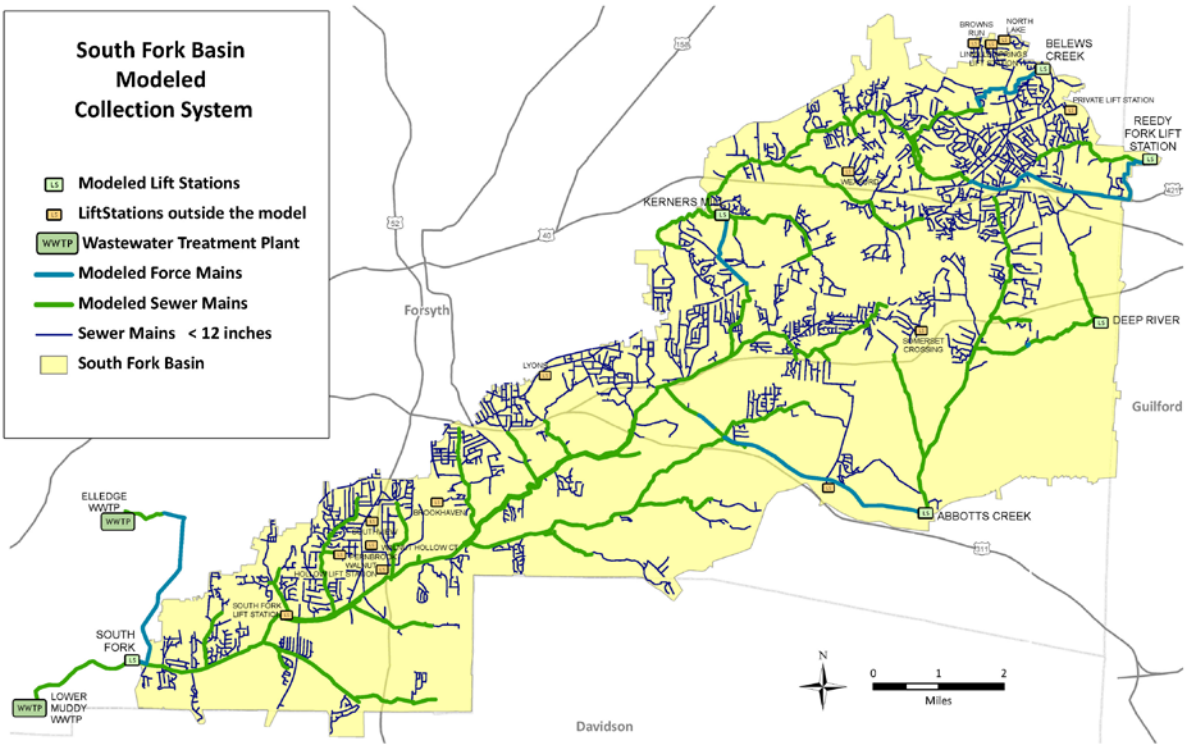
The master plan will guide wastewater system capital improvement projects over a 30-year period. The plan will identify and prioritize wastewater system improvements to ensure that the commission can meet future regulatory requirements, maintain system capacity and reliability, and accommodate growth.

The Utility Commission provides sewer service to about 95,000 wastewater customers. Within Forsyth County it serves Winston-Salem, Clemmons, Kernersville and the surrounding communities. Outside Forsyth County, the commission provides sewer service to a portion of Davie County, King and a portion of north Davidson County.

The wastewater collection system comprises approximately 1,700 miles of sewer lines in three sewer basins: Muddy Creek, Salem Creek, and South Fork Creek. Lines in the Salem Creek and South Fork Creek basins flow to the Archie Elledge Wastewater Treatment Plant. It has a permitted capacity of 30 million gallons a day and has an average treatment flow of 19.5 million gallons a day. The sewer lines in the Muddy Creek basin flow to the Muddy Creek Wastewater Treatment plant. It is permitted for 21 million gallons a day and has an average flow of 14.5 million gallons a day.

To assist with developing short- and long-term growth projections for the wastewater system, members of the Utilities Division staff and consulting engineers have met with the staff of the City/County Planning Board, which recently completed Legacy 2030, a comprehensive plan to guide growth in Winston-Salem and Forsyth County.

The consulting engineers also have been asked to identify inflow




and infiltration sources and develop a plan for future rehabilitation. After completion of the study, a detailed report will be submitted with project recommendations and cost estimates for five-, 10-, 15-, 20- and 30-year planning periods. This report will guide capital improvement project funding.

During fiscal year 2012 and beginning of FY 2013, the primary focus of the study will be the South Fork Creek basin. The Utility Commission staff has identified this area as a priority due to potential future growth and capacity needs. Because the GIS/Asset Management project is running simultaneously with the master plan study, crews have been shifted to prioritized areas for inventory and collection of assets. This is allowing engineers to model the system accurately and efficiently.

At the conclusion of the study, the consulting engineers will deliver a system-wide model and capacity tool that will assist the Utility Commission staff in applying for permits to accommodate new flows into the wastewater system.

The Utility Commission is scheduled to receive the final report by January 2014. The overall budget for the Wastewater Master Plan is $2,381,877. Expenditures spent through FY 2012 total $470,027.

## Transportation Projects Affect Utilities Infrastructure

The North Carolina Department of Transportation has plans for several roadway improvements within Forsyth County that will affect water and sewer lines within the public right-of-way.

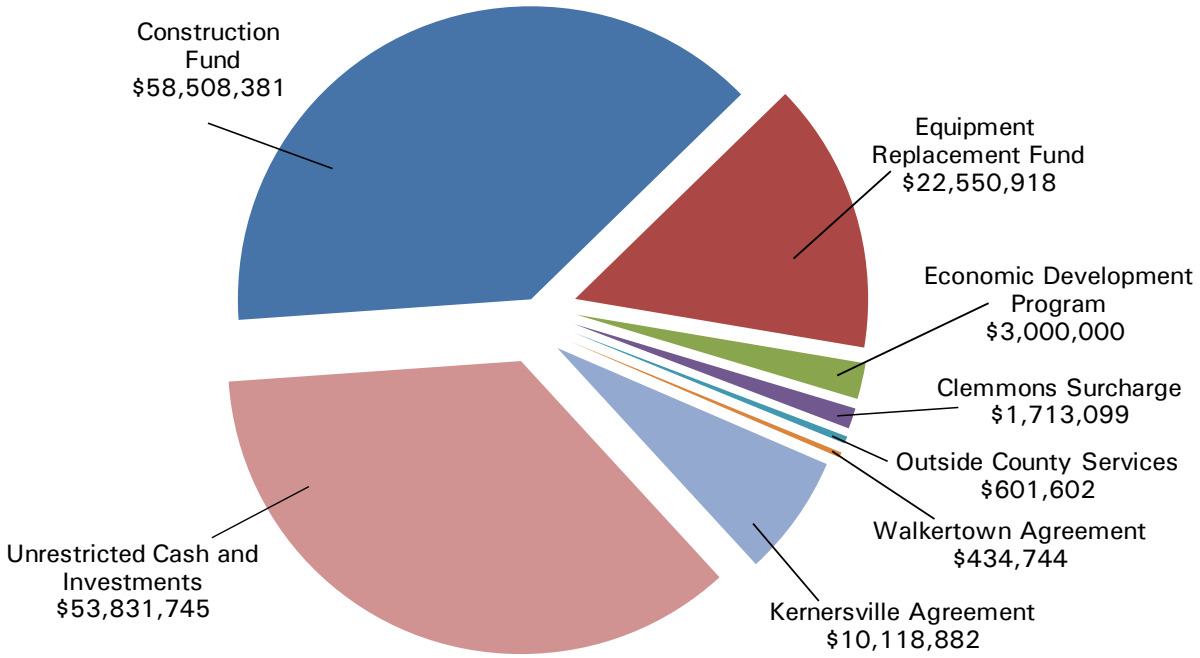
Projects under construction in FY 2012 were replacement of the U.S. 421 bridge over Muddy Creek, replacement of the Salisbury Street bridge over Business I-40, and widening of Union Cross Road.

Future projects include the Macy Grove Road interchange at Interstate 40, the Salem Creek Connector, the Idols Road Extension, the Kerners Mill Creek bridge replacement, the Northern Beltway project at Business I-40, and Hastings Hill Road bridge over Business I-40.

All these projects have utility lines within the project limits that need to be relocated The Utility Commission is responsible for the cost of relocating all utility lines located within the state's right-of-way.

Through FY 2012, the commission has allocated $1,128,000 for utility relocations necessitated by NCDOT projects. The estimated costs for future utility relocations on NCDOT projects total $5,810,000.

# WINSTON-SALEM/FORSYTH COUNTY UTILITY SYSTEM RESTRICTED CASH AND INVESTMENTS




**DEFINITIONS FOR RESERVES:**

**Trustee Construction Fund:** This fund holds unspent revenue bond proceeds that can only be used for the purposes for which the bonds were issued.

**Clemmons, Kernersville and Walkertown Reserves:** These fund are generated from the rates charged to customers in Clemmons, Kernersville and Walktertown. The City-County Utility Commission holds these funds in trust for these municipalities to be used for their water and sewer systems.

**Equipment and Replacement Fund:** Excess water and sewer revenues restricted for major maintenance and capital expenditures. This fund is currently being used to fund PAYGO annually for CIP.

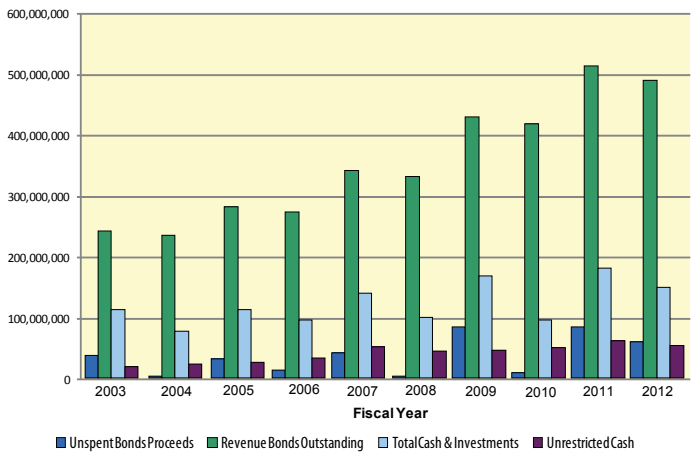
**Economic Development Reserve:** In April 1987, the City-County Utility Commission set aside $3 million to advance to businesses locating in industrial parks within Forsyth County for the extension of water and sewer infrastructure.

**Outside County Services Reserve:** In 1995 and 1996, the City Council and the Forsyth County Board of Commissioners amended the 1976 agreement establishing the Utility Commission to authorize the Commission to charge customers outside Forsyth County higher rates than those charged to customers within the county. The amendment also authorized the Utility Commission to set aside up to 50% of the revenue generated from these higher rates to be used for economic development projects approve by the City Council and the Forsyth County Commissioners.

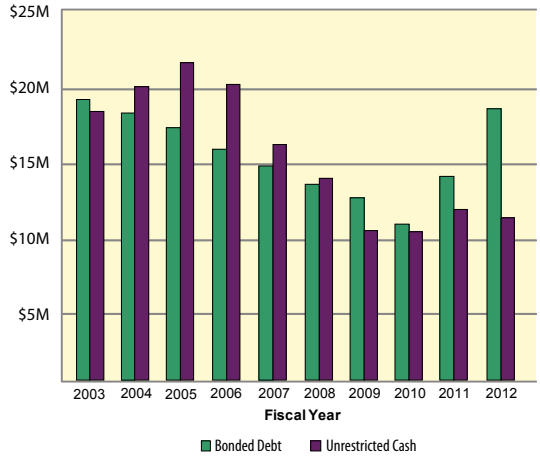
**Unrestricted:** Funds used to pay for operations and those portions of the Utility Commission's Capital Improvement Plan not funded with Revenue Bonds or the Equipment & Replacement Funds.

# SUMMARY OF FINANCIAL STATEMENTS

### WATER AND SEWER FUND




### SOLID WASTE FUND




## Water and Sewer Utility Fund

For FY 2011-12, total operating revenues were $76,744,707. This was $3,268,603 less than budgeted, but up $6,206,571 from FY 2010-11 even though water demand remained flat during the fiscal year. The 8.8 percent increase in revenue is directly related to the rate increase implemented during the fiscal year.

Operating expenditures totaled $38,202,949, which was $3,386,934 less than the budgeted expenses of $41,589,883. The bulk of the operational expense savings were in the areas of salary savings due to numerous vacant positions during the year, reduced contracted services cost, reduced cost of treatment chemicals, reduced cost of support for IT infrastructure, and reduced usage of natural gas that fuels the biosolids drying facility.

Investment income for the fiscal year was $773,700, a decrease of $9,682,446 over the previous year and was primarily due to a downturn in the equity market in 2011.

The fund ended the fiscal year with $150,759,372 in cash and cash equivalents. This is $28,440,849 less than the $179,200,221 in cash and cash equivalents the fund had at the start of the fiscal year which is due to the drawdown of bond proceeds for capital projects expenditures.Included in the cash and cash equivalents are unspent bond proceeds of $58,508,381 at June 30, 2012.

Accounting for debt service, investment income, and all other non-operating costs, the Water and Sewer Utility Fund ended the 2011-12 fiscal year with a net increase in assets of $3,924,139 (full accrual basis).

## Solid Waste Fund

The Solid Waste Fund ended FY 2011-12 with total net assets of $40,305,777, reflecting a net decrease in assets of $2,017,608 (full accrual basis), after adjusting for the non-operating costs and transfers to the general fund to pay for the city's curbside recycling program and the county drop-off recycling programs.

Both operating revenues and operating expenditures were lower than budgeted amounts. Operating revenues and operating expenditures were also slightly lower than previous year's levels.

Operating revenues for the solid waste fund for FY 2011-12 were $9,283,681. This was $1,390,809 less than the budgeted revenues of $10,674,490, and $594,076 less than the actual revenues for FY 2010-11 at $9,877,757. The decrease in revenue is directly attributed to the decrease in tonnages of waste being disposed at Utility Commission owned facilities.

Operating expenditures totaled $6,824,179, or $1,949,319 less than the budgeted amount of $8,773,498. Expenses were reduced in the areas of equipment maintenance and professional services. The transfer out to the general fund to pay for recycling programs was $2,080,087 in FY 2011-12. Transfers in from the Stormwater, Water and Sewer funds were $384,885, to cover the cost of the household hazardous waste management facility, 3RC.

The unrestricted net cash at the end of 2012 was $11,694,987, and restricted cash was $14,010,936.

# City of Winston-Salem, North Carolina
# Enterprise Funds

Water and Sewer Utility Fund - Statement of Net Assets
June 30, 2012 and June 30, 2011

| Assets | 2012 | 2011 |
|---|---|---|
| **Current Assets** | | |
| Cash and cash equivalents | $ 53,831,745 | $ 59,992,574 |
| Receivables, net of allowance for uncollectibles | | |
| Accounts | 10,647,272 | 9,080,502 |
| Assessments | 785,568 | 895,984 |
| Total receivables | 11,432,840 | 9,976,486 |
| Due from other governments | 108,154 | 10,592 |
| Inventories | 2,617,075 | 2,736,753 |
| Total current assets | 67,989,814 | 72,716,405 |
| **Noncurrent Assets** | | |
| Restricted Assets | | |
| Cash and cash equivalents | | |
| Equipment and replacement fund | | |
| Reserved | 38,419,246 | 35,734,673 |
| Construction | | |
| Trustee construction fund | 58,508,381 | 83,472,974 |
| Total restricted assets | 96,927,627 | 119,207,647 |
| Property and Equipment | | |
| Land | 14,925,904 | 14,715,645 |
| Buildings | 276,357,903 | 168,180,969 |
| Improvements other than buildings | 701,286,596 | 664,452,140 |
| Machinery and equipment | 18,018,308 | 17,699,786 |
| Construction in progress | 39,229,592 | 151,278,639 |
| Total property and equipment | 1,049,818,303 | 1,016,327,179 |
| Less accumulated depreciation | 334,829,018 | 312,290,061 |
| Property and equipment, net | 714,989,285 | 704,037,118 |
| Other | | |
| Unamortized financing costs | 3,710,161 | 3,944,186 |
| Deferred outflow of resources | 31,540,890 | 16,945,724 |
| Total noncurrent assets | 847,167,963 | 844,134,675 |
| Total assets | 915,157,777 | 916,851,080 |

Statement E-4

| | 2012 | 2011 |
|---|---|---|
| **Liabilities** | | |
| **Current liabilities** | | |
| Accounts payable | $ 12,183,217 | $ 10,965,517 |
| Accrued payroll | 225,487 | 178,501 |
| Accrued vacation | 200,617 | 233,861 |
| Accrued interest payable | 1,390,087 | 1,123,871 |
| Prepaid assessments | 39,014 | 72,694 |
| Current maturities | | |
| Contracts payable | 159,067 | 265,162 |
| Bonds payable | 15,910,000 | 15,575,000 |
| Total current liabilities | 30,107,489 | 28,414,606 |
| **Noncurrent liabilities** | | |
| Contracts payable from restricted assets | 1,217,363 | 7,167,995 |
| Accrued vacation | 663,811 | 664,889 |
| Contracts payable | 246,665 | 261,257 |
| Bonds payable | 485,704,206 | 501,643,395 |
| Derivative instrument liability | 31,540,890 | 16,945,724 |
| Total long-term liabilities | 519,372,935 | 526,683,260 |
| Total liabilities | 549,480,424 | 555,097,866 |
| **Net Assets** | | |
| Invested in capital assets, net of related debt | 271,477,728 | 269,765,278 |
| Unrestricted | 94,199,625 | 91,987,936 |
| Total net assets | **$ 365,677,353** | **$ 361,753,214** |

# City of Winston-Salem, North Carolina
# Enterprise Funds

Statement E-5

Water and Sewer Utility Fund - Statement of Revenues, Expenses, and Changes in Net Assets
For the Fiscal Years Ended June 30, 2012 and 2011

| | 2012 | 2011 |
|---|---|---|
| **Operating Revenues** | | |
| Sales | | |
| Water | $ 39,155,106 | $ 36,242,754 |
| Sewer | 31,409,309 | 28,151,649 |
| Industrial waste surcharge | 2,757,178 | 2,565,034 |
| Total sales | 73,321,593 | 66,959,437 |
| Charges for services | | |
| New connections | 319,791 | 315,910 |
| Special area and privilege charges | 534,260 | 719,994 |
| Main line capital cost revenue | 83,195 | 102,500 |
| Other charges for services | 2,473,703 | 2,426,333 |
| Total charges for services | 3,410,949 | 3,564,737 |
| Other | 12,165 | 13,962 |
| Total operating revenues | 76,744,707 | 70,538,136 |
| **Operating Expenses** | | |
| Personal services | 16,535,147 | 15,346,646 |
| Maintenance and operations | 21,868,973 | 21,208,931 |
| Total operating expenses before depreciation | 38,404,120 | 36,555,577 |
| Depreciation | 22,965,611 | 21,166,996 |
| Total operating expenses | 61,369,731 | 57,722,573 |
| Operating income | 15,374,976 | 12,815,563 |
| **Nonoperating Revenues (Expenses)** | | |
| Intergovernmental revenue | 1,728,339 | 1,137,823 |
| Investment income (loss) | 715,543 | 10,456,145 |
| Gain (loss) on disposal of assets | 3,114 | 11,144 |
| Damage settlements | 2,888 | 1,680 |
| Interest and fiscal expense | (18,256,590) | (13,931,571) |
| Amortization of financing costs | (204,837) | (450,687) |
| Total nonoperating expenses, net | (16,011,543) | (2,775,466) |
| Loss before capital contributions and operating transfers | (636,567) | 10,040,097 |
| **Capital Contributions** | | |
| Conveyances | 2,897,504 | 4,868,495 |
| Intergovernmental revenue | 1,754,797 | 127,894 |
| Other | 230,450 | 47,043 |
| Total capital contributions | 4,882,751 | 5,043,432 |
| **Operating Transfers Out** | | |
| General fund | (65,455) | (60,988) |
| Capital projects fund | - | (1,284,240) |
| Solid waste disposal fund | (256,590) | (239,541) |
| Total transfers out | (322,045) | (1,584,769) |
| Change in net assets | 3,924,139 | 13,498,760 |
| **Total net assets - beginning** | 361,753,214 | 348,254,454 |
| **Total net assets - ending** | **$ 365,677,353** | **$ 361,753,214** |

# City of Winston-Salem, North Carolina
# Enterprise Funds

Statement E-6

Water and Sewer Utility Fund - Statement of Cash Flows
For the Fiscal Years Ended June 30, 2012 and 2011

| | 2012 | 2011 |
|---|---|---|
| **Cash Flows from Operating Activities** | | |
| Cash received from sales | $ 75,254,673 | $ 71,230,317 |
| Cash payments to suppliers for goods and services | (20,531,595) | (19,114,885) |
| Cash payments to employees for services | (16,522,483) | (15,266,588) |
| Net cash provided by operating activities | 38,200,595 | 36,848,844 |
| **Cash Flows from Noncapital Financing Activities** | | |
| Intergovernmental revenue | 1,728,339 | 1,137,823 |
| Operating transfers out | (322,045) | (1,500,529) |
| Net cash used by noncapital financing activities | 1,406,294 | (362,706) |
| **Cash Flows from Capital Financing Activities** | | |
| Proceeds from issuance of bonds | - | 137,353,503 |
| Increase in contracts payable | - | 7,639 |
| Intergovernmental revenue | 1,657,235 | 132,580 |
| Capital contributions | 41,156 | 700 |
| Transfers out | - | (84,240) |
| Acquisition of property and equipment | (31,859,426) | (39,099,563) |
| Retirement of bonds | (15,575,000) | (12,900,000) |
| Retirement of refunded bonds | - | (25,065,000) |
| Retirement of contracts payable | (301,283) | (330,208) |
| Interest and fiscal expense paid on bonds | (22,945,899) | (20,874,713) |
| Interest paid on contracts payable | (34,108) | (42,455) |
| Debt issuance costs | - | (1,230,312) |
| Proceeds from sale of assets | 3,705 | 15,746 |
| Damage settlements | 192,182 | 48,023 |
| Net cash provided (used) by capital financing activities | (68,821,438) | 37,931,700 |
| **Cash Flows from Investing Activities** | | |
| Investment income | 773,700 | 10,456,145 |
| Net increase (decrease) in cash | (28,440,849) | 84,873,983 |
| **Cash and Cash Equivalents July 1** | 179,200,221 | 94,326,238 |
| **Cash and Cash Equivalents June 30** | **$ 150,759,372** | **$ 179,200,221** |
| **Reconciliation of Cash and Cash Equivalents** | | |
| Cash and cash equivalents - current | $ 53,831,745 | $ 59,992,574 |
| Cash and cash equivalents - restricted | 96,927,627 | 119,207,647 |
| **Cash and Cash Equivalents June 30** | $ 150,759,372 | $ 179,200,221 |
| **Reconciliation of Operating Income to Net Cash Provided by Operating Activities** | | |
| Operating income | $ 15,374,976 | $ 12,815,563 |
| Adjustments to reconcile operating income to net cash provided by operating activities | | |
| Depreciation expense | 22,965,611 | 21,166,996 |
| Change in assets and liabilities | | |
| (Increase) decrease in receivables | (1,456,354) | 702,244 |
| (Increase) decrease in inventories | 119,678 | (204,018) |
| Increase (decrease) in accounts payable | 1,217,700 | 2,298,064 |
| Increase (decrease) in accrued payroll | 46,986 | 47,182 |
| Increase (decrease) in prepaid assessments | (33,680) | (10,063) |
| Increase (decrease) in accrued vacation | (34,322) | 32,876 |
| Total adjustments | 22,825,619 | 24,033,281 |
| Net cash provided by operating activities | **$ 38,200,595** | **$ 36,848,844** |

# City of Winston-Salem, North Carolina
# Enterprise Funds

Schedule E-7

Water and Sewer Utility Fund - Schedule of Revenues, Expenditures, and Transfers - Budget (Non-GAAP Basis) and Actual
For the Fiscal Year Ended June 30, 2012

| | Budget | Actual | Variance Favorable (Unfavorable) |
|---|---|---|---|
| **Operating Revenues** | | | |
| Sales | | | |
| Water | $ 40,400,740 | $ 39,155,106 | $ (1,245,634) |
| Sewer | 33,512,570 | 31,409,309 | (2,103,261) |
| Industrial waste surcharge | 2,500,000 | 2,757,178 | 257,178 |
| Total sales | 76,413,310 | 73,321,593 | (3,091,717) |
| Charges for services | | | |
| New connections | 300,000 | 319,791 | 19,791 |
| Special area and privilege charges | 750,000 | 534,260 | (215,740) |
| Main line capital cost revenue | 100,000 | 83,195 | (16,805) |
| Other charges for services | 2,450,000 | 2,473,703 | 23,703 |
| Total charges for services | 3,600,000 | 3,410,949 | (189,051) |
| Other | - | 12,165 | 12,165 |
| Total operating revenues | 80,013,310 | 76,744,707 | (3,268,603) |
| **Operating Expenditures** | | | |
| Personal services | 17,446,460 | 16,535,147 | 911,313 |
| Maintenance and operations | 24,143,423 | 21,667,802 | 2,475,621 |
| Total operating expenditures | 41,589,883 | 38,202,949 | 3,386,934 |
| Operating income | 38,423,427 | 38,541,758 | 118,331 |
| **Nonoperating Revenues (Expenditures)** | | | |
| Intergovernmental revenue | 1,728,340 | 1,728,339 | (1) |
| Investment income | - | 773,700 | 773,700 |
| Proceeds from sale of assets | - | 3,705 | 3,705 |
| Damage settlements | - | 2,888 | 2,888 |
| Interest and fiscal charges | (19,590,610) | (19,528,088) | 62,522 |
| Principal retirement | (15,906,010) | (15,876,283) | 29,727 |
| Total nonoperating expenditures, net | (33,768,280) | (32,895,739) | 872,541 |
| Loss before capital contributions and transfers | 4,655,147 | 5,646,019 | 990,872 |
| **Capital Contributions** | | | |
| Conveyances | - | 2,897,504 | 2,897,504 |
| Intergovernmental revenue | - | 1,754,797 | 1,754,797 |
| Other | - | 230,450 | 230,450 |
| Total capital contributions | - | 4,882,751 | 4,882,751 |
| **Transfers Out** | | | |
| General fund | (73,440) | (65,455) | 7,985 |
| Solid waste disposal fund | (256,600) | (256,590) | 10 |
| Total transfers out | (330,040) | (322,045) | 7,995 |
| Change in net assets - modified accrual basis | **$ 4,325,107** | **$ 10,206,725** | **$ 5,881,618** |

**Reconciliation of Modified Accrual Basis to Full Accrual Basis**

| | |
|---|---|
| Change in Net Assets - Modified Accrual Basis | $ 10,206,725 |
| Depreciation | (22,965,611) |
| Unamortized financing costs | (204,837) |
| Principal retirement | 15,876,283 |
| Book value of disposed assets | (201,762) |
| Interest expense, net of investment income, capitalized on construction projects | 1,213,341 |
| Change in Net Assets - Full Accrual Basis | **$ 3,924,139** |

# City of Winston-Salem, North Carolina
# Enterprise Funds

Statement E-8

Solid Waste Disposal Fund - Statement of Net Assets
June 30, 2012 and June 30, 2011

| Assets | 2012 | 2011 |
|---|---|---|
| **Current Assets** | | |
| Cash and cash equivalents | $ 11,694,987 | $ 12,046,154 |
| Accounts receivables, net of allowance for uncollectibles | 259,414 | 306,432 |
| Due from other governments | 43,110 | 79,519 |
| Total current assets | 11,997,511 | 12,432,105 |
| **Noncurrent Assets** | | |
| Restricted Assets | | |
| Cash and cash equivalents | | |
| Landfill closure and postclosure costs | 14,010,936 | 13,500,662 |
| Total cash and cash equivalents | 14,010,936 | 13,500,662 |
| Property and Equipment | | |
| Land | 8,966,453 | 10,621,972 |
| Buildings | 3,655,255 | 3,562,156 |
| Improvements other than buildings | 34,793,672 | 34,906,697 |
| Machinery and equipment | 6,162,670 | 5,311,709 |
| Construction in progress | 16,480,891 | 13,170,818 |
| Total property and equipment | 70,058,941 | 67,573,352 |
| Less accumulated depreciation | 23,023,793 | 21,416,354 |
| Property and equipment, net | 47,035,148 | 46,156,998 |
| Other | | |
| Unamortized financing costs | 180,662 | 208,709 |
| Total noncurrent assets | 61,226,746 | 59,866,369 |
| Total assets | 73,224,257 | 72,298,474 |
| **Liabilities and Fund Equity** | | |
| **Liabilities** | | |
| Current liabilities | | |
| Accounts payable | 431,261 | 1,400,456 |
| Accrued payroll | 24,759 | 18,926 |
| Accrued vacation | 36,410 | 30,944 |
| Accrued interest payable | 80,102 | 90,856 |
| Landfill closure and postclosure costs | 2,887,000 | 283,000 |
| Current maturities | | |
| Contracts payable | 405,010 | 391,883 |
| Bonds payable | 2,035,000 | 1,385,000 |
| Total current liabilities | 5,899,542 | 3,601,065 |
| Noncurrent liabilities | | |
| Accrued vacation | 72,874 | 68,958 |
| Landfill closure and postclosure costs | 11,123,936 | 13,217,662 |
| Contracts payable | 713,278 | 437,519 |
| Bonds payable | 15,108,850 | 12,649,885 |
| Total noncurrent liabilities | 27,018,938 | 26,374,024 |
| Total liabilities | 32,918,480 | 29,975,089 |
| **Net Assets** | | |
| Investment in capital assets, net of related debt | 28,773,010 | 31,292,711 |
| Unrestricted | 11,532,767 | 11,030,674 |
| Total net assets | $ 40,305,777 | $ 42,323,385 |

# City of Winston-Salem, North Carolina
# Enterprise Funds

Statement E-9

Solid Waste Disposal Fund - Statement of Revenues, Expenses, and Changes in Net Assets
For the Fiscal Years Ended June 30, 2012 and 2011

| | 2012 | 2011 |
|---|---|---|
| **Operating Revenues** | | |
| Charges for services | $ 9,263,935 | $ 9,859,300 |
| Other | 19,746 | 18,457 |
| Total operating revenues | 9,283,681 | 9,877,757 |
| **Operating Expenses** | | |
| Personal services | 1,755,748 | 1,724,367 |
| Maintenance and operations | 5,068,431 | 5,300,280 |
| Total operating expenses before depreciation | 6,824,179 | 7,024,647 |
| Depreciation | 1,624,953 | 1,607,181 |
| Total operating expenses | 8,449,132 | 8,631,828 |
| Operating income | 834,549 | 1,245,929 |
| **Nonoperating Revenues (Expenses)** | | |
| Intergovernmental revenue | 860,953 | 746,972 |
| Investment income (loss) | 499,317 | 857,209 |
| Gain (loss) on disposal of assets | (1,974,462) | (28,556) |
| Damage settlements | 1,620 | - |
| Interest and fiscal expense | (500,322) | (539,209) |
| Amortization of financing costs | (44,061) | (37,571) |
| Total nonoperating expenses, net | (1,156,955) | 998,845 |
| Income before transfers | (322,406) | 2,244,774 |
| **Transfers In (Out)** | | |
| General fund | (2,080,087) | (2,371,847) |
| Water and sewer utility fund | 256,590 | 239,541 |
| Stormwater management fund | 128,295 | 119,770 |
| Total operating transfers in (out) | (1,695,202) | (2,012,536) |
| Change in net assets | (2,017,608) | 232,238 |
| **Total net assets - beginning** | 42,323,385 | 42,091,147 |
| **Total net assets - ending** | **$ 40,305,777** | **$ 42,323,385** |

# City of Winston-Salem, North Carolina
# Enterprise Funds

Statement E-10

Solid Waste Disposal Fund - Statement of Cash Flows
For the Fiscal Years Ended June 30, 2012 and 2011

| | 2012 | 2011 |
|---|---|---|
| **Cash Flows from Operating Activities** | | |
| Cash received from sales | $ 9,330,699 | $ 9,984,290 |
| Cash payments to suppliers for goods and services | (4,524,549) | (4,661,379) |
| Cash payments to employees for services | (1,740,533) | (1,711,027) |
| Net cash provided by operating activities | 3,065,617 | 3,611,884 |
| **Cash Flows from Noncapital Financing Activities** | | |
| Intergovernmental revenue | 897,362 | 667,453 |
| Transfers in | 384,885 | 359,311 |
| Transfers out | (2,080,087) | (2,371,847) |
| Net cash used by noncapital financing activities | (797,840) | (1,345,083) |
| **Cash Flows from Capital Financing Activities** | | |
| Proceeds from issuance of bonds | 4,478,851 | 4,170,107 |
| Acquisition of property and equipment | (4,546,737) | (3,085,528) |
| Retirement of bonds | (1,385,000) | (1,325,000) |
| Retirement of contracts payable | (562,075) | (439,861) |
| Interest and fiscal expense paid on bonds | (511,536) | (485,921) |
| Interest and fiscal expense paid on contracts payable | (82,210) | (63,808) |
| Debt issuance costs | (900) | (74,863) |
| Proceeds from sale of assets | - | 237,550 |
| Damage settlements | 1,620 | - |
| Net cash used by capital financing activities | (2,607,987) | (1,067,324) |
| **Cash Flows from Investing Activities** | | |
| Investment Income (loss) | 499,317 | 857,209 |
| Net increase (decrease) in cash | 159,107 | 2,056,686 |
| **Cash and Cash Equivalents July 1** | 25,546,816 | 23,490,130 |
| **Cash and Cash Equivalents June 30** | **$ 25,705,923** | **$ 25,546,816** |
| **Reconciliation of Cash and Cash Equivalents** | | |
| Cash and cash equivalents - current | $ 11,694,987 | $ 12,046,154 |
| Cash and cash equivalents - restricted | 14,010,936 | 13,500,662 |
| **Cash and Cash Equivalents June 30** | $ 25,705,923 | $ 25,546,816 |
| **Reconciliation of Operating Income to Net Cash Provided by Operating Activities** | | |
| Operating income | $ 834,549 | $ 1,245,929 |
| Adjustments to reconcile operating income to net cash provided by operating activities | | |
| Depreciation expense | 1,624,953 | 1,607,181 |
| Change in assets and liabilities | | |
| (Increase) decrease in receivables | 47,018 | 106,533 |
| Increase (decrease) in accounts payable | 33,608 | (2,385) |
| Increase (decrease) in accrued payroll | 5,833 | 4,707 |
| Increase in accrued vacation | 9,382 | 8,633 |
| Increase in landfill closure and postclosure costs | 510,274 | 641,286 |
| Total adjustments | 2,231,068 | 2,365,955 |
| Net cash provided by operating activities | **$ 3,065,617** | **$ 3,611,884** |

# City of Winston-Salem, North Carolina
# Enterprise Funds

Schedule E-11

Solid Waste Disposal Fund - Schedule of Revenues, Expenditures, and Transfers - Budget (Non-GAAP Basis) and Actual
For the Fiscal Year Ended June 30, 2012

| | Budget | Actual | Variance Favorable (Unfavorable) |
|---|---|---|---|
| **Operating Revenues** | | | |
| Charges for services | $ 10,643,920 | $ 9,263,935 | $ (1,379,985) |
| Other | 30,570 | 19,746 | (10,824) |
| Total operating revenues | 10,674,490 | 9,283,681 | (1,390,809) |
| **Operating Expenditures** | | | |
| Personal services | 1,847,380 | 1,755,748 | 91,632 |
| Maintenance and operations | 6,926,118 | 5,068,431 | 1,857,687 |
| Total operating expenditures | 8,773,498 | 6,824,179 | 1,949,319 |
| Operating income | 1,900,992 | 2,459,502 | 558,510 |
| **Nonoperating Revenues (Expenditures)** | | | |
| Intergovernmental revenue | 785,670 | 860,953 | 75,283 |
| Investment income | 256,610 | 499,317 | 242,707 |
| Damages settlements | - | 1,620 | 1,620 |
| Interest and fiscal charges | (908,410) | (582,992) | 325,418 |
| Principal retirement | (2,690,100) | (1,947,075) | 743,025 |
| Total nonoperating expenditures, net | (2,556,230) | (1,168,177) | 1,388,053 |
| Income before transfers | (655,238) | 1,291,325 | 1,946,563 |
| **Transfers In (Out)** | | | |
| General fund | (2,319,650) | (2,080,087) | 239,563 |
| Water and sewer utility fund | 256,600 | 256,590 | (10) |
| Stormwater management fund | 128,300 | 128,295 | (5) |
| Total transfers in (out) | (1,934,750) | (1,695,202) | 239,548 |
| Change in net assets - modified accrual basis | **$ (2,589,988)** | **$ (403,877)** | **$ 2,186,111** |

**Reconciliation of Modified Accrual Basis to Full Accrual Basis**

| | |
|---|---|
| Change in Net Assets - Modified Accrual Basis | $ (403,877) |
| Depreciation | (1,624,953) |
| Amortization of financing costs | (44,061) |
| Principal retirement | 1,947,075 |
| Book value of disposed assets | (1,974,462) |
| Interest expense, net of investment income, capitalized on construction projects | 82,670 |
| Change in Net Assets - Full Accrual Basis | **$ (2,017,608)** |

# The Nation's Second Oldest Water System

## Public Utilities in Winston-Salem Part 1: 1778-1913

On March 23, 1778, Johann Freidrich Peter, the diarist for the Moravian town of Salem in the northwest North Carolina wilderness, made a historic entry. In his small, neat, slanting hand, Peter wrote, "The pipe water was brought into the kitchen of the single brethren, and this far reaching work was brought to an end."

With this step, the residents of Salem completed the nation's second oldest utilities system. Using logs, these industrious settlers piped water from a spring a half mile away into the town.

The typical log "pipe" was five to eight feet long and about eight inches in diameter, with a 1.5-inch diameter hole bored in the center down its length. The ends were trimmed and fitted together at first. Later, iron rings were used to connect the pipes. The log pipes were laid in a straight line from the spring to the town; the Moravians know enough about the physics of water pressure to use smaller-diameter bore holes in the pipes running uphill.

It was a true water system, with distribution to five different locations in the town, including the tannery, the tavern, and the kitchens for the dormitories that housed the congregation's unmarried women and men. A standpipe at the town square served the rest of the 126 residents.

One hundred and thirty-five years later, in 1913, this system, long since expanded and improved, would merge with the Winston water system when the towns consolidated. Next year, when Winston-Salem celebrates the 100th anniversary of the consolidation, the utilities system that serves the city and Forsyth County will proudly mark its 235th birthday.

Certain aspects of the enterprise, however, remain timeless. Then, as now, those running the water system grappled with getting folks to pay their water bills, as noted in a diary entry for Feb. 1, 1780: "It is evident that the receipts have not exceeded the expenses, and this should be made known to the entire congregation, for then no one can object to the payment of 9d. (9 pence) each four weeks."

**1828 Waterwheel**

Winters brought entries about frozen pipes, and low pressure prompted searches to find and fix leaky pipes or connections. Capital improvements came in the form of a switch to clay pipes in 1808, which gave way to iron pipes in 1842.

An even bigger change came in 1828, when the town replaced the gravity-fed spring system, which was no longer capable of providing sufficient water for the growing population. The new system used a waterwheel to send water to a series of cisterns in the town, from which it was distributed.

# The Nation's Second Oldest Water System (continued)

As detailed in John Clewell's "History of Wachovia," the new water system was an ambitious enterprise. "Starting at Bath Branch," he wrote, "the water to turn the wheel was conducted along the hillside in a wooden trough, a distance of two miles. In crossing the ravine east of Park Avenue it was necessary to support the trough on a high trestle; then it passed through Academy Park and when it reached the wheel house, it had sufficient elevation to fall upon the great fifteen-foot wheel which revolved ceaselessly day and night."

The pastor of Home Moravian Church in Salem recorded that the three cylindrical pumps operated by the wheel sent water to the town at a rate of 300 gallons per hour. "All the cisterns, from one end of town to the other are plentifully supplied with water, and at a number of places where risers have been placed, the water is fresh for drinking, even in the hottest weather."

This system served the town for fifty years. In 1878, private investors formed the Salem Water Supply Corp., acquired the assets of the 1828 water system, and folded them into a new water system that used a 66,000-gallon above-ground reservoir to feed a system of two-, three-, six- and eight-inch pipes laid throughout the town. Nine years later this reservoir was replaced with a 400,000-gallon iron reservoir 55 feet in diameter.

Next door, in the town of Winston (established as the county seat in 1849 with the creation of Forsyth County), a group of citizens formed the Winston Water Company in 1880. North of town, they built a water plant near a pond and wells that supplied a large brick reservoir whose sloping walls rose 40 feet above ground and 20 feet below. The reservoir water was purified through sand filters before being distributed.

At the urging of residents, the Winston town government bought out the company in 1894 and started

**1904 Reservoir Collapse**

operating the water plant. Ten years later, disaster struck. On Nov. 2, 1904, the north wall of the brick reservoir collapsed at 5:20 in the morning, sending a million gallons of water crashing downhill into a neighborhood. One man looking out his window saw the torrent carrying away parts of houses and rubbish. Some people were crushed under the bricks and stone and some were swept away. The flood killed nine people and destroyed eight houses.

The Winston aldermen relocated the plant to the east side of town, where they bought seven acres straddling Brushy Fork Creek and built a dam to create Winston Lake. With the move, the water plant was enlarged to treat and filter two million gallons a day.

Winston would suffer yet another reservoir failure in 1912, when the Winston Lake Dam broke, this time with no loss of life and little damage due to its location on the outskirts of town. Repairs were made and the water plant there remained in use.

By then the Salem Water Supply Company had been bought out by the town of Salem, giving both towns a municipally owned and operated water sys-

**Completion of the water system in 1778 was recorded in the Salem Diary**

tem. Calls for a municipal take-over began in 1901, when an outbreak of typhoid fever called attention to the water company's refusal to run water lines to mill housing. After several years of negotiation a purchase price was agreed upon and in 1906 the citizens of Salem overwhelmingly approved a bond issue to purchase the company. The sale was completed in 1907.

The sale included a pumping station and filter plant built in 1901 along Salem Creek less than a mile east of the Salem town square. This plant was the start of what would become the R.A. Thomas Water Treatment Plant.

A year later the town built a steel standpipe, 16 feet in diameter and 100 feet tall, a mile south of the Salem Water Plant and next to the 1.5 million gallon ground-level reservoir the Salem Water Supply Company had built in 1898 to supplement its 1887 iron reservoir.

In 1913, as the citizens in Winston and Salem were preparing to go to the polls to vote on consolidation into a single municipality, Salem was expanding its water plant's capacity to two million gallons a day.

Before the year was out, the Salem and Winston water systems would be melded into a single public entity to serve the new city of Winston-Salem. In the coming years the city would repeatedly find itself expanding its water system to keep up with a population boom that would make it North Carolina's largest city during the 1920s.


**1913 - Winston and Salem consolidate**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