



Caroline County  
Department of Public Utilities

CAROLINE PINES  
Water System Update

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## Caroline Pines Water System Overview

In October 2010, the Board of Supervisors authorized the borrowing of \$3 million to connect the Caroline Pines subdivision to the County's public water system in Carmel Church. The project extended a 12-inch waterline along Ruther Glen Road (Route 652) approximately 3,300 feet into Caroline Pines along Shannon Mill Drive and connected the homes in Caroline Pines to the County water system.

In 2012, the Caroline County Board of Supervisors established the "Caroline Pines Service District" (map on page 2) and began operating the 50-plus-year-old water system on September 1, 2012. This project was a significant undertaking by the Utility Department, and at that time, we had 363 active accounts. Today, we have 428 active accounts.

The Caroline Pines Service District established a \$2,800 availability fee to help offset the cost of the water line project, which the residents were given the opportunity to pay over 60 months through an interest-free loan. The monthly loan payments were \$46.67, and at this time, we have collected all of the availability fees. Total availability fees collected \$1,016,400. Total Project Cost ~2 million.

The system's operations have been running smoothly. However, due to the aging infrastructure, we have had 44 water main breaks and 58 service line leaks, for a total of 102 water leaks to date. The Caroline Pines Service District is averaging nine (9) water line repairs per year. (Water leak map page 4) The majority of the breaks are a result of the freezing and thawing of the ground, which then causes the expansion and contraction of the PVC-glued pipes. This remains our most significant concern.

The water quality has improved immensely in the subdivision. The peak monthly usage in the Caroline Pines Service District this past year occurred in August, with 56,068 gallons per day, which equates to 131 gallons per day per resident.

The Caroline Pines Water System was established in the 1960s and is over 60 years old. The useful life of water lines is 50 years. Thus, most of the lines in the system have reached the end of their useful life. A replacement program has been implemented to ensure the residents of this district have a sustainable water system, thus reducing failure in service and poor water quality issues.

Staff had put together a replacement plan over a 30-year period that included a waterline project every five (5) years. This plan outlines a timeline for when each waterline is scheduled for replacement, as well as current market values for construction estimates, engineering costs, and contingencies. Initially, the plan will address pressure issues that were identified in our recent water system hydrodynamic modeling. This would be followed by upgrades and replacements to the oldest service lines or those that have experienced the greatest amount of leaks.

This plan will be a living document, and adjustments will be made prior to each five-year construction project.

Staff has determined that the Caroline Pines monthly Capital Reserve Fee of \$20.24 should be increased to \$30.24 to provide the necessary funding to meet the five-year replacement plan outlined on page 5. In addition, the rate should increase by \$5.00 per year for the next 7 years to meet the replacement plans.

Caroline County Public Utilities Applied for four grants to pay for the Caroline Pines Water Line & Pressure Zone projects. Each of these was unsuccessful.

- \$1,644,000 Drinking Water State Revolving Fund (DWSRF) Round 1
- \$1,644,000 Bipartisan Infrastructure Law (BIL) Round 1
- \$1,644,000 Drinking Water State Revolving Fund (DWSRF) Round 2
- \$1,644,000 Bipartisan Infrastructure Law (BIL) Round 2

This project consisted of replacing a 5,400 lf section of waterline with a 12" pipe and installing two pressure-reducing valves to create a new pressure zone to help eliminate water line breaks.

Caroline County has collected the following Capital Reserve Fees:

\$484,925.62 – FY-24 Audited Numbers

\$586,391.84 - FY-25 Unaudited Numbers

#### Approved Projects

The FY-25/26 Budget includes the Engineering Services for field survey, site plan, erosion and sediment control plan, design services, and specifications for two additional pressure zones along with the design of the water line along Shannon Mill and Summer Drive.



Caroline Pines Water Line Break Map-







## **Caroline County Enterprise Fund – Public Utilities**

### **Enterprise Funds**

Enterprise funds account for operations that are financed and operated in a manner similar to private business enterprises, where the intent is that costs of providing goods or services are recovered primarily through user charges.

### **Caroline Utilities Fund**

The Caroline Utilities Fund accounts for revenues and expenditures from the operation of the County's public water and sewer system. The long-term goal of the Caroline Utilities Fund is to operate as a self-supporting unit covering operational, capital and debt service costs with revenues from water and sewer user fees and availability and connection fees from new connections. The County's public water system consists of four systems owned and operated by Caroline County: Central System (Ladysmith and Carmel Church service areas), High School and Middle School (Poorhouse System), Milford System and State Fair System. All systems combined serve approximately 1,794 customers.

The Central System is located along the I-95 and U.S. Route 1 corridor and includes the Ladysmith service area, the Carmel Church service area and the Caroline Pines subdivision. The system serves residential, commercial and industrial users and is supplied by various well throughout the system. Based upon the current Virginia Department of Health (VDH) engineering description sheets (EDS), the water supply facilities have a combined average daily capacity of approximately 632,000 gallons per day.

The system consists of approximately 52.2 miles of waterline ranging from 2 to 16 inches in diameter. There are currently a total of nine (9) operating well facilities, which provide water supply to the system, two elevated storage tanks, one ground storage tank and a booster pump station, which pumps out of the ground storage tank. There are three water treatment facilities, which treat raw groundwater throughout the system from the various well facilities.

The High School System, also known as the Poorhouse System, is located along Devils Three Jump Road at the intersection of Rogers Clark Boulevard (Route 207). The system primarily serves residential customers and Caroline High School and Caroline Middle School. Water is supplied by two wells, which pump directly into the system. Based on the current VDH EDS, the water supply facilities have a combined average daily capacity of approximately 69,000 GPD and a DEQ groundwater withdrawal maximum daily capacity of approximately 102,000 GPD.

The High School System consists of approximately 1.1 miles of waterline ranging in diameter from 2 to 16 inches. The two wells operate to fill an elevated storage tank, which provides pressure to the system.

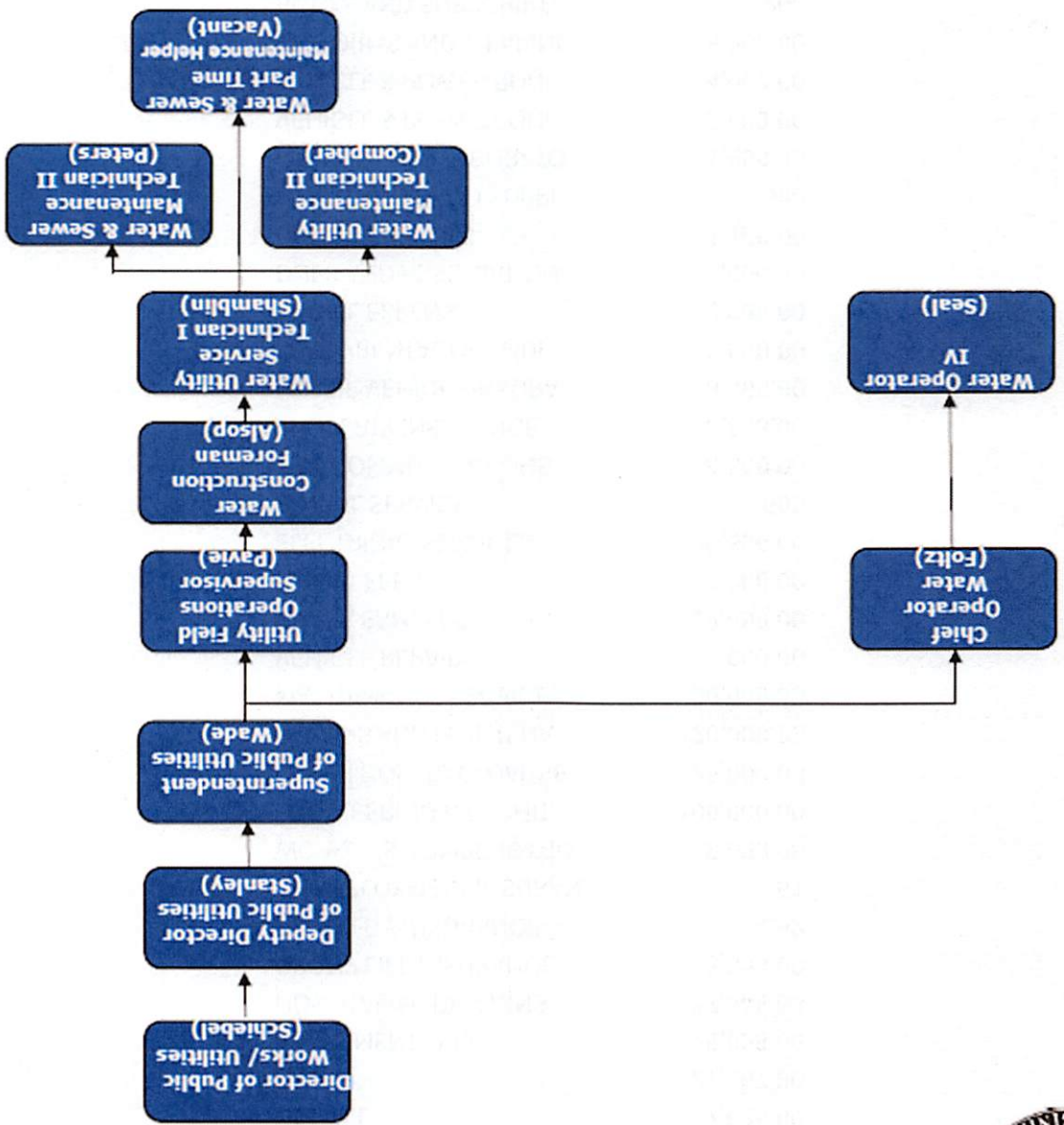
The Milford Water System is located along the New Baltimore Road (Route 640) corridor west of Route 301 and east of Nelson Hill Road (Route 722). The system serves residential, commercial and industrial users and is supplied by two wells. Based upon the current VDH EDS, the water supply facilities have a combined average daily treatment capacity of approximately 172,000 GPD

and a DEQ groundwater withdrawal maximum daily capacity of approximately 209,000 GPD.

The system consists of approximately 7.6 miles of waterline ranging from 2 to 8 inches. Currently, two wells operate to fill an elevated storage tank.

The State Fair System is located along Route 30 at Meadow Event Park, just west of the North Anna River, which creates the border with Hanover County. The system serves Meadow Event Park (MEP) solely. Caroline County owns a 250,000-gallon ground storage tank and booster pump station, which are used to provide storage and distribution of water during events at MEP. All waterlines within the system are owned by the State Fair. Water is purchased from Hanover County by Caroline County and then resold to the Meadow Event Park for use during events.

**CAROLINE COUNTY  
DEPARTMENT OF PUBLIC UTILITIES  
WATER  
ORGANIZATIONAL CHART**



## WATER SUPPLY AND TREATMENT BUDGET

Line Item	Budget
SALARIES AND WAGES -	268,535.00
SALARIES AND WAGES -	18,500.00
ONCALL	7,635.00
FICA	21,957.00
RETIREMENT - VRS	25,028.00
HOSPITAL/MEDICAL INS	57,548.00
GROUP LIFE INSURANCE	3,599.00
DISABILITY INSURANCE	352
UNEMPLOYMENT INSURAN	51
WORKER'S COMPENSATIO	9,000.00
ENGINEERING & ARCHIT	100,000.00
OTHER CONTRACTUAL SE	25,000.00
REPAIRS AND MAINTENA	120,000.00
MAINTENANCE SERVICE	60,000.00
VEHICLE REPAIRS	15,000.00
WATER SAMPLES	18,000.00
PERMIT FEES	7,000.00
ELECTRICAL SERVICES	120,500.00
POSTAL SERVICES	500
TELECOMMUNICATIONS	4,500.00
PROPERTY INSURANCE	3,833.00
MOTOR VEHICLE INSURA	3,465.00
LEASE/RENTAL OF EQUI	3,500.00
TRAVEL EXPENSE	3,000.00
DUES AND ASSOCIATION	1,000.00
OFFICE SUPPLIES	1,100.00
MEALS AND FOOD SUPPL	500
MEDICAL AND LABORATO	1,850.00
VEHICLE & POWER EQUI	19,000.00
VEHICLE & POWER EQUI	4,000.00
UNIFORMS AND WEARING	8,000.00
BOOKS AND SUBSCRIPTI	200
OTHER OPERATING SUPP	220,000.00
CHEMICALS	45,000.00
MACHINERY AND EQUIPM	16,000.00
FURNITURE AND FIXTUR	1,500.00
DATA PROCESSING EQUI	2,000.00
<b>WATER SUPPLY &amp; TREATMENT</b>	<b>1,216,653.00</b>