Winston-Salem/Forsyth County Utilities

wsfcutilities.org

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Agenda

1. Who we are
2. Water Treatment
3. Utilities Field Operations
4. Wastewater Treatment
5. Solid Waste

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Who we are…

Vision

To be a top-performing utility proactively safeguarding public health and the environment through a culture of continuous improvement.

Mission

Our dedicated team provides quality water, wastewater and solid waste services to the region through responsible use of resources.

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Who we are…

Values

Winston-Salem/Forsyth County Utilities is committed to meeting the needs of its region, through:

- **Integrity** - being open and honest
- **Dedication** - to our customers and our employees
- **Quality** - providing safe and reliable services
- **Stewardship** - of our environment and public health

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Historic Origins

- Water system began in 1770s in Old Salem
- Sewer system began in 1880s to serve Winston Township

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WSFC Utilities History

Section of water pipe used in Old Salem.

Installation of large pipe near Salem Creek. Photo circa 1955.

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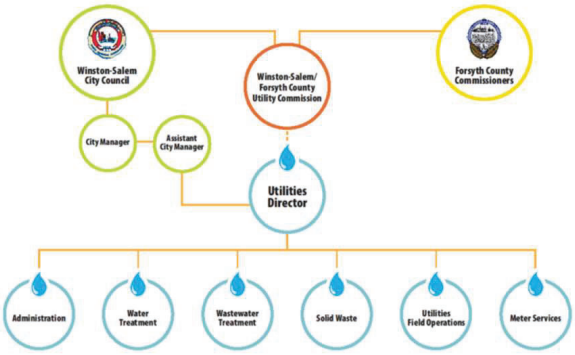

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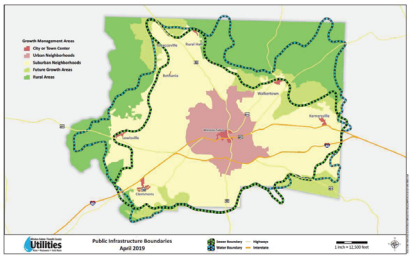
Who we are…



Governed by a joint agency

- Winston-Salem/Forsyth County Utility Commission
- Formed by a 1976 merger of city and county water and sewer systems
- Solid waste disposal services added in 1990

Enterprise Fund

- Not funded by local taxes

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Winston-Salem/Forsyth County Utility Commission

Randall S. Tuttle, Chair
L. Wesley Curtis, Jr., Vice Chair

Harold E. Day
Tom Griffin
Yvonne H. Hines
Hugh W. Jernigan
Duane Long
D. Christopher Parker
Charles Wilson
Allan Younger

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What about rates?

FY 2021-2022 Water & Sewer Rate Comparison
Average Residential Customer
(Based on 1,200 cf bimonthly consumption inside city rate)

	Current Bimonthly Charge
High Point	$153.10
Raleigh	$134.12
Charlotte	$125.34
Durham	$123.14
Winston-Salem	$104.47
Greensboro	$ 98.38

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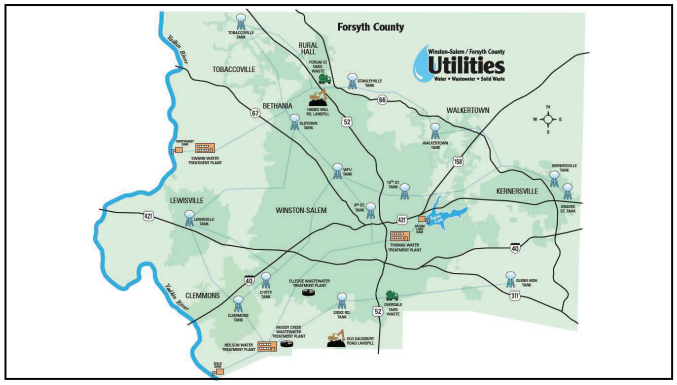

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2 Water Treatment

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Water System Overview

- Source waters are the Yadkin River and Salem Lake
- Winston-Salem controls the 30 feet (11 billion gallons) of W. Kerr Scott
- Three treatment plants, that have a combined treatment capacity of 91 MGD.
- In FY 2021 system averaged approx. 35.8 MGD, which is ~39.3% of current capacity
- In FY 2021 the system pumped 13.06 billion gallons of water
- In FY 2021 the cost per million gallons was approximately $725
- In FY2022 $10.48 million has been budgeted to operate and maintain the water plants, distribution pump stations and tanks

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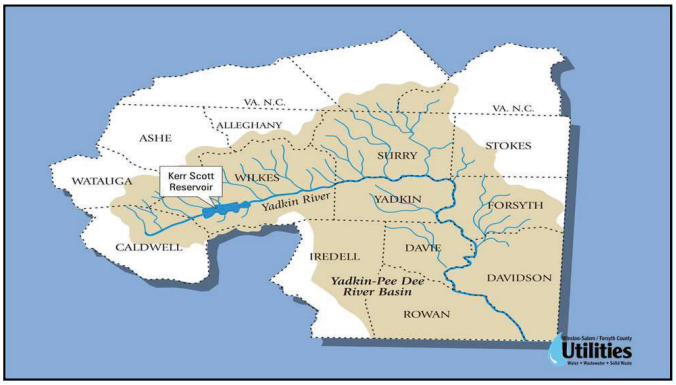

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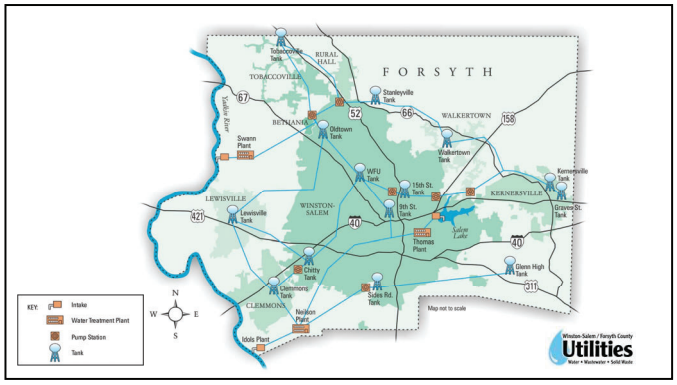

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Paschal W. Swann Water Treatment Plant

- 25 MGD conventional treatment
- Receives raw water from Yadkin River
- Began operation in July 2004

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Robert W. Neilson Water Treatment Plant

- 48 MGD conventional treatment
- Receives raw water from Yadkin River
- Began operation in 1964

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Richard A. Thomas Water Treatment Plant

- 18 MGD conventional treatment
- Receives raw water from Yadkin River and Salem Lake
- Began operation in 2011

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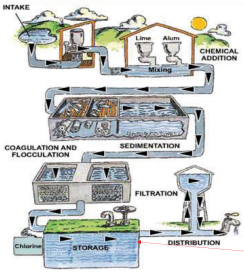
Treatment Process



- All conventional water treatment plants employ the same processes
- Multi-barrier approach
- Plant SCADA system monitors both the treatment plant and distribution system tanks/pump stations
- Routine water quality tests conducted both at the plant and throughout the distribution system
- Reporting requirements for contaminant detection are published in the annual Water Quality Report (Consumer Confidence Report)

Zinc Orthophosphate = corrosion control

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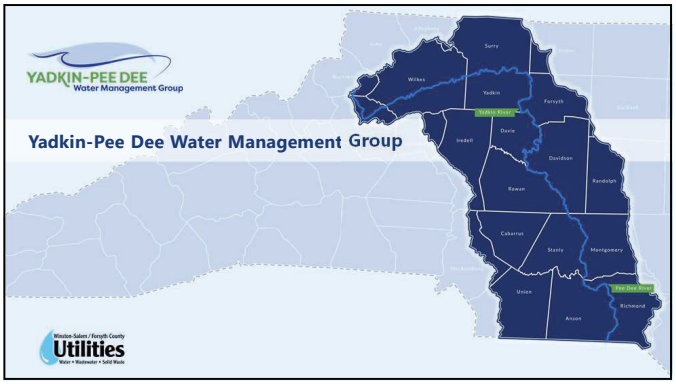

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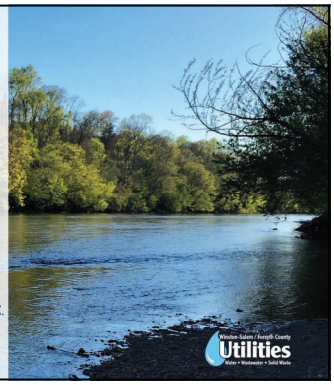
Our Basin

- 7 Interconnected reservoirs
- Used by more than 1.7 million people
  - Drinking water
  - Industry
  - Agriculture
  - Power production (hydropower and thermoelectric)
  - Recreation
- 7,200+ square mile drainage area in N.C.



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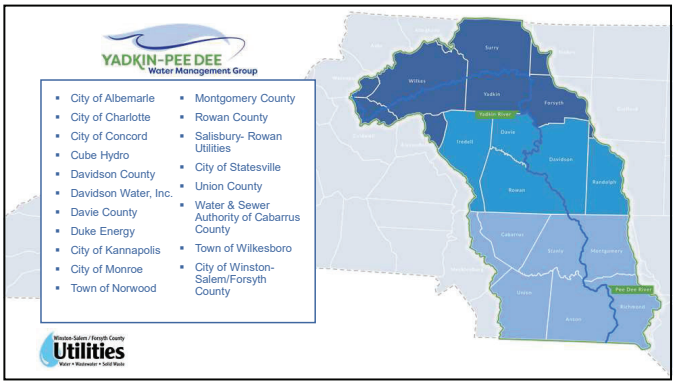
YADKIN-PEE DEE Water Management Group

- City of Albemarle
- City of Charlotte
- City of Concord
- Cube Hydro
- Davidson County
- Davidson Water, Inc.
- Davie County
- Duke Energy
- City of Kannapolis
- City of Monroe
- Town of Norwood
- Montgomery County
- Rowan County
- Salisbury- Rowan Utilities
- City of Statesville
- Union County
- Water & Sewer Authority of Cabarrus County
- Town of Wilkesboro
- City of Winston-Salem/Forsyth County



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YADKIN-PEE DEE

Our Mission and Values

"Enhance the welfare of basin residents by jointly planning for the sustainable use of water from the Yadkin-Pee Dee River Basin."

- Regional collaboration
- Sustainable water supply
- Environmental stewardship
- Mutual and collective benefit
- Shared responsibility and accountability
- Equal representation and mutual respect
- Financial stability
- Health and welfare of citizens of the basin

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Water System Tanks & Pump Stations

Tanks and Pump Stations provide for:

- Fire Protection
- System Pressure
- Storage

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3 Utilities Field Operations (UFO)

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Utilities Field Operations

Utilities Field Operations provides "front line" customer service for the utility throughout the city and county.

The division consists of five work groups.

- Water Distribution
- Meter Services
- Wastewater Collection / System Compliance
- Construction Services
- Technical Services

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2015 Cold Weather Snap

HWY 52 at Cassell

Click image to start/stop video

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Water Distribution

Water Service Installation

- Maintain 2,324 miles of infrastructure
- Includes pipes, valves, connections, and approximately 20,000 hydrants
- Install and repair mains and services, repair and replace hydrants, etc.
- Emergency Response

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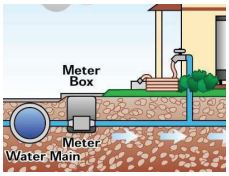
Meter Services

- Start and stop water service
- Read and maintain approximately 128,000 residential, commercial & industrial meters
- Maintenance includes replacing, repairing and rebuilding meters ranging from ¾" to 10"
- Leak and usage investigations



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Wastewater Collection

- Maintain 1,800 miles of infrastructure
- 47,770 manholes
- Clean and inspect sewer mains and connections
- Reclaim and maintain easements
- Respond to sewer stoppages and overflows

Sewer Connection Renewal

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Grease Deposits & Wipes In Manhole

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Root Intrusion

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Can the Grease

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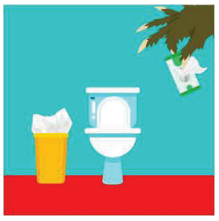
No Wipes in Pipes

English/Spanish Flyers



Animation & Video on WSTV, YouTube & Social Media

Social Media Graphics & Email Signature Thumbnails

cityofws.org/nowipes

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Cross-Connection Control

Per North Carolina General Statute

A supplier of water shall not authorize connections to hydrants for construction or other temporary, non-emergency use without an approved air gap or properly installed reduced pressure backflow prevention assembly.

Utilities

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Cross-Connection Control

Per North Carolina General Statute

Each supplier of water shall install or require to be installed the appropriate testable backflow prevention assembly prior to making the service connection…Each public water system shall maintain records of the location, device type, installation date, type of potential hazard, and results of all backflow field tests.

Utilities

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4 Wastewater Treatment

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Archie Elledge Wastewater Treatment Plant

Operating since 1956 - 30 MGD treatment capacity - Discharges treated water into Salem Creek

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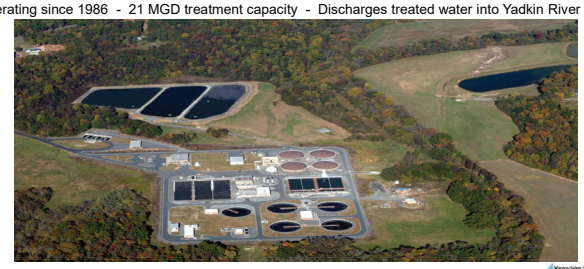
Muddy Creek Wastewater Treatment Plant

Operating since 1986 - 21 MGD treatment capacity - Discharges treated water into Yadkin River



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The Treatment Process

First Step: Preliminary Treatment – Bar Screening

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Preliminary Treatment – Grit Removal

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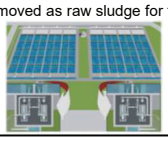
The Treatment Process

Second Step: Primary Clarification

- Basic concept: separate solids from liquids
- Water is held in tanks for 2 to 3 hours
- Removes 60-70% of total suspended solids (TSS) and ~40% of biochemical oxygen demand (BOD)
- Removes floating oils and grease
- Solids removed as raw sludge for further treatment



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The Treatment Process

Third Step: Secondary Treatment

- Wastewater is mixed with biologically active sludge in a large basin
- We manage the biomass so that ~5 pounds of "bugs" are fed a pound of BOD and create "new bugs"
- During this process ammonia is also oxidized to nitrate
- Archie Elledge Wastewater Treatment Plant maintains a biomass inventory of ~185 tons and produces about 22,000 pounds of excess activated sludge daily that must be wasted-out to keep the process stable

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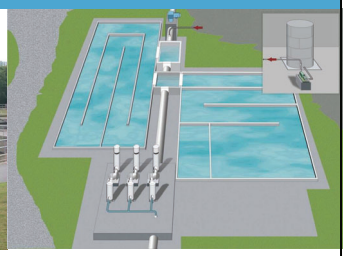
The Treatment Process



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The Treatment Process

Final Step: Final Clarification

- The mixed liquor from secondary treatment flows into final clarifiers where the biomass flocs together and settles out leaving a clear layer of water
- This clear water is disinfected using bleach, then dechlorinated and discharged to the stream
- Most solids collected in the clarifiers are pumped back to secondary treatment where they are used again

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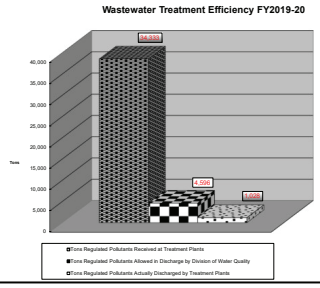
WWTP Removal Efficiency FY19-20



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Biosolids Drying Facility

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Support Programs

- Laboratory
  - Our chemists perform ~160 chemical analyses per day required to operate the treatment plants and protect public health
  - The lab maintains our historical operating database and creates Discharge Monitoring Reports
- Maintenance
- Electrical & Instrumentation

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Industrial Waste Control

- Issues permits and monitors discharges from significant industrial users
- Monitors additional industries for compliance with Sewer Use Ordinance policies
- Administers the grease control program and monitors ~900 food service establishments to prevent sewer lines clogged with fats, oils and grease

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Archie Elledge Wastewater Treatment Plant & Manson Meads Complex

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5 Solid Waste

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Solid Waste Facilities and Programs in Forsyth County

- **Municipal Solid Waste Disposal**
  - Hanes Mill Road Landfill (opened in 1972)
  - Received 286,312 tons of trash in FY2020-2021
- **Construction and Demolition Debris Disposal**
  - Old Salisbury Road Landfill (opened 1996)
  - Received over 43,177 tons of construction and demolition in FY2020-2021
- **Yard Waste Processing & Composting**
  - Overdale Road and Forum 52 Parkway
- **Recycling and Diversion Programs**
  - Kernersville, Pfafftown and Hanes Mill Road Drop-off Recycling
  - Household Hazardous & Electronic Waste Collection
  - Scrap Tire Recycling
  - Appliances, Scrap Metal and Concrete Recycling

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Hanes Mill Road Landfill

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Hanes Mill Road Landfill

Scalehouse

- Two scale system, certified
- Weigh trucks in and out
- Invoice or pay cash/credit (per ton)
- Flat rates for small vehicles
- No local tax revenue is used
- NC charges us a tax for every ton of solid waste disposed at our facilities
- Operations are the largest portion of the solid waste budget

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Hanes Mill Road Landfill

Working Face

- Complex and busy area
- Used primarily by large waste haulers
- Waste is compacted to increase life of landfill
- Waste is covered daily (soil or tarps)

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Hanes Mill Road Landfill

Citizen Convenience Center

- Provides citizens with a safer place to drop off small amounts of waste rather than the working face
- Minimizes traffic at landfill working face

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Hanes Mill Road Landfill

Landfill Liner & Leachate Collection System

- Required for MSW landfills
- Protects groundwater
- Collects water that has come into contact with waste
- Treated at wastewater plant

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Hanes Mill Road Landfill

Landfill Gas Recovery & Energy Production

- Operated by a contractor
- Recovers methane gas from landfill
- Produces about 3 million kilowatt-hours of electricity per month
- Energy equivalent to power 5,000 homes

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Appliance and Scrap Metal Recycling

- Appliances banned from landfill disposal
- Collected for free at Hanes Mill Rd.
  - Transported to Omni-Source for recycling
- White Goods collected: 435 tons
- Scrap Metal collected: 114 tons

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Scrap Tire Recycling

- Whole tires banned from landfill disposal
- Scrap tires collected and stored at Hanes Mill Rd.
- Contract operation with US Tire
- Collected: 6,317 tons

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Household Hazardous Waste Collection

Contract with 3RC EnviroStation
1401 S. Martin Luther King Jr. Drive

- Opportunity for residents to keep certain household waste out of landfills, the wastewater system and storm drains
- Collected: 540 tons
- Cost fully reimbursed by Stormwater, and the Water & Wastewater Divisions

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Electronic Waste Collection

Contract with 3RC EnviroStation
1401 S. Martin Luther King Jr. Drive

- Certain E-waste banned from landfill disposal
  - Computers, televisions, printers, scanners
- Collected: 211 tons
- Costs partially reimbursed through the State e-waste trust fund

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Old Salisbury Road Construction & Demolition Waste Landfill

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Yard Waste Processing & Composting

- Two locations: Overdale & Forum 52
- Yard waste banned from landfill since 1993
- Waste accepted: brush, yard debris & leaves
- Annual leaf compost give-away program every Spring at Forum 52
- Received 40,742 tons of brush and yard debris in FY 20-21
- Contract with Wallace Farm, Inc.

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Recycling Services

Recycling & Waste Diversion:

- Drop-off recycling sites
- School recycling
- Appliance, scrap metal recycling
- Scrap tire recycling
- Concrete, asphalt, brick recycling



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Drop-Off Recycling Facilities

- Hanes Mill Road Landfill
- Kernersville Drop-Off Center
- Pfafftown Drop-Off Center
- Collected 875 tons in FY 20-21

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