

Union County, NC Department of Public Works Wastewater Performance Summary Fiscal Year 2018-2019

Wastewater Plants

- Twelve Mile Creek WRF – NC0085359
- Crooked Creek WRF – NC0069841
- Olde Sycamore WRF – WQ0011928
- Tallwood WWTP – NC0069523
- Grassy Branch WWTP – NC0085812
- Hunley WWTP – NC0072508

Collection System WQCS00054

BioSolids – Land Application WQ0007486 - NCDEQ ND0089044 - SCDHEC



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Dear Customer,

We are proud to share this year's Annual Wastewater System Performance Summary with you. This report outlines last year's wastewater treatment efforts. Included are details about your treatment facilities, collection system performance, and how it compares to standards set by regulatory agencies.

Wastewater is all the water that leaves the inside of your home or business through sinks, toilets, washing machines, etc. and enters Union County's wastewater (sewage) collection system. Wastewater then flows through pipes into the County's regional sewage system, where it is treated to meet federal and state water quality standards.

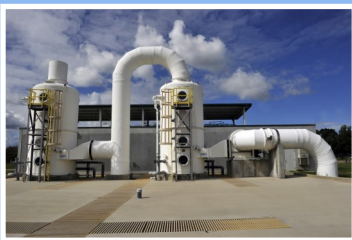
We have a responsibility to manage our water resources in a sustainable manner to ensure there is sufficient water and its quality is protected. While we are committed to conserving resources and protecting the environment through wastewater treatment, this can only occur if it is done in a safe manner. Protection of public health and safety is, and must remain, our first priority. We are proud of our achievements to date, but we aim to constantly improve the way we manage the wastewater generated by our residents.

If you have any questions about this report or concerning your water, please contact us at 704-296-4210. If you want additional information, please visit our website at www.unioncountync.gov.

Sincerely,

Andy

Andrew Neff, P.E.
Water & Wastewater Division Director
Union County Public Works
500 North Main Street
Monroe, NC 28112



Public Works' Vision Statement:

We are recognized for providing exemplary service through the engagement of our employees in the efficient and effective management of our assets and resources.



1.0 INTRODUCTION

Nature has an amazing ability to cope with small amounts of water wastes and pollution, but it would be overwhelmed if we didn't treat the wastewater and sewage produced every day before releasing it back to the environment. Treatment plants reduce pollutants in wastewater to a level nature can handle.

Wastewater is used water. It includes substances such as human waste, food scraps, oils, soaps and chemicals. In homes, this may be water from sinks, showers, bathtubs, toilets, washing machines and dishwashers. Businesses and industries also contribute their share of used water that must be cleaned.

If wastewater is not properly treated, then the environment and human health can be negatively impacted. These impacts include harm to fish and wildlife populations, oxygen depletion, restrictions on recreational water use, and contamination of drinking water.

House Bill 1160, the Clean Water Act of 1999, was ratified by the North Carolina General Assembly on July 20, 1999 and signed into law by the Governor on July 21, 1999. This legislation placed significant reporting requirements on entities that own or operate wastewater systems. This Performance Summary is intended to establish compliance with this rule.

Union County Public Works (UCPW) is charged with the management, operation and maintenance of the County's sanitary sewer system. During the 2019-2020 fiscal year the wastewater system was comprised of 5 active wastewater treatment plants (WWTP), 80 wastewater pumping stations, and over 700 miles of pipe with 37,266 connections. In addition to the 5 WWTPs which have a combined rated treatment capacity of 8.15 million gallons per day (MGD), the County, through contractual agreement, has 2.65 MGD and 3.0 MGD of purchased capacity at the City of Monroe WWTP and Charlotte's McAlpine Creek WWTP respectively.





2.0 DEFINITIONS

For the purposes of this Performance Report the following definitions apply:

- **Aerobic** – A condition in which atmospheric or dissolved molecular oxygen is present in the aquatic environment.
- **Biological Nutrient removal** – The process of removing nitrogen and phosphorus from wastewater using biological processes as opposed to chemical means.
- **Biosolids** – A primarily organic solid product, produced by wastewater treatment processes that can be beneficially recycled. The word *biosolids* replaces the word *sludge*.
- **BOD – Biochemical Oxygen Demand** – The rate at which organisms use the oxygen in water or wastewater while stabilizing decomposable organic matter under aerobic conditions. The BOD Test is a procedure that measures the rate of oxygen use under controlled conditions of time and temperature. BOD is typically used to express the “strength” of wastewater.
- **CL₂ – Chlorine Residual** – The amount of chlorine present in the final effluent after disinfection. Typically measured in micrograms per liter or milligrams per liter.
- **D.O. – Dissolved Oxygen** – Molecular (atmospheric) oxygen dissolved in a liquid.
- **Effluent** – Treated wastewater flowing from the treatment system.
- **Extended Aeration** – A type of wastewater treatment facility in which the wastewater is retained and treated for a minimum of 24 hours at design flow before discharge occurs.
- **Inflow and Infiltration (I&I)** - Extraneous water that enters the sanitary sewer system through openings and/or defects in the collection system.
- **Fecal Coliform** – The coliform (bacteria) found in the feces of warm blooded animals. The presence of coliform-group bacteria is an indication of possible pathogenic bacterial contamination.
- **MGD – Million Gallons per Day** – Volumetric measurement of flow converted to millions. Example 150,000 gallons per day (gpd) / 1,000,000 = 0.150 MGD.
- **NH₃ – Nitrogen as Ammonia** – A compound found naturally in wastewater. The compound is produced by the deamination of organic nitrogen containing compounds
- **NPDES Permit – National Pollutant Discharge Elimination System - Permits**, required by the Federal Water Pollution Control Act Amendments of 1972, which regulate discharges to surface waters.
- **pH** – The expression of the intensity of the basic or acidic condition of a liquid.
- **Pump Station** – A holding tank with pumps that forces wastewater uphill when flow by gravity is not possible.
- **Reclaimed Water** – Highly treated wastewater that has undergone advanced treatment processes to remove solids, organics, and pathogens meeting the State’s Health and Safety Standards for Beneficial Reuse.
- **SSO** – Acronym for “**sanitary sewer overflow**”
- **TSS – Total Suspended Solids** – Particles suspended in a liquid.
- **Turbidity** – The measurement of the clearness or cloudiness of a liquid.



3.0 SYNOPSIS OF WASTEWATER TREATMENT FACILITIES (Fiscal Year 2018-2019)

During the 2018-19 fiscal year the Department of Public Works operated and maintained a total of five (5) active wastewater treatment facilities and maintained one (1) inactive facility. Although each Permit requires facility visitation daily, excluding weekends and holidays, Public Works' wastewater treatment facilities are checked 7 days per week, 365 days per year. All treatment facilities are equipped with emergency back-up power generators. In addition to SCADA, each facility has both audible and visual trouble alarms. Wastewater treatment plant staff rotate "call duty" for after hour situations that may arise.

A brief overview of each facility and a performance summary table for each facility is provided herein.

Twelve Mile Creek Water Reclamation Facility

Permit No. NC0085359. Twelve Mile Creek WRF is an extended aeration facility utilizing biological nutrient removal and tertiary filtration. Disinfection is accomplished via UV (ultraviolet light). Twelve Mile effluent is discharged into Twelve Mile Creek, which is part of the Catawba River Basin. The facility is permitted to discharge up to 6.0 MGD of treated wastewater. Twelve Mile Creek WWTP is located at 8299 Kensington Drive and serves Waxhaw as well as portions of Indian Trail, Stallings and Weddington. Please refer to Table 3-1.

Crooked Creek Water Reclamation Facility

Permit No. NC0069841. Crooked Creek WRF is an extended aeration facility utilizing tertiary filtration. Disinfection is accomplished via UV (ultraviolet light). Crooked Creek effluent is pumped over 17,000 feet to discharge into the North Fork Crooked Creek which lies in the Yadkin Pee Dee River Basin. This facility is permitted to discharge up to 1.9 MGD of treated wastewater. Crooked Creek is located at 4015 Sardis Church Road and serves the Indian Trail, Lake Park and Stallings areas. Please refer to Table 3-2.

Hunley Creek Wastewater Treatment Plant

Permit No. NC0072508. The facility was taken out of service May 10, 2006, via a flow diversion project and remains inactive. Hunley Creek is located at 6913 Stevens Mill Road. Due to "Inactive Status" of the Hunley Creek WWTP, there was no data to report to Table 3-3 for fiscal year 2016-2017.

Olde Sycamore Water Reclamation Facility

Permit No. WQ0011928. Olde Sycamore is an extended aeration facility with tertiary filtration. Disinfection is accomplished via UV (ultraviolet light). This facility is permitted to discharge up to 0.150 MGD (150,000 per gallons per day) of treated wastewater. Olde Sycamore was "up-fitted" in early 2012 to improve operating efficiency (reduced electrical consumption) by implementing usage of fine-bubble diffused aeration versus the former "coarse-bubble" aeration. Olde Sycamore serves the Olde Sycamore Golf Community located off Highway 218 and Rock Hill Church Road. Olde Sycamore effluent is discharged to a man-made impoundment from which it is then pumped onto the Olde Sycamore Golf Course as a source of irrigation. Please refer to Table 3-4.

Tallwood Estates Wastewater Treatment Plant

Permit No. NC0069523. Tallwood is an extended aeration facility with cloth-disc filtration. Disinfection is accomplished via UV (ultraviolet light). This facility is permitted to discharge up to 0.05 MGD (50,000 gallons per day) of treated wastewater. Tallwood plant was replaced in 2013 with a new facility. Tallwood is located within and serves the Tallwood Subdivision off Brief Road and Belk Boy Scout Camp. Tallwood effluent is discharged to Clear Creek, which lies in the Yadkin Pee Dee River Basin. Please refer to Table 3-5.

Grassy Branch Wastewater Treatment Plant

Permit No. NC0085812. Grassy Branch is an extended aeration facility with tertiary filtration. Disinfection is accomplished via UV (ultraviolet light). This facility is permitted to discharge up to .05 MGD (50,000 gallons per day) of treated wastewater. Grassy Branch is located at 1629 Old Fish Road and currently serves the Unionville Elementary, Piedmont Middle and Piedmont High School as well as one individual residence, Loxdale Farms Subdivision, and Smith Field Sub-division. Grassy Branch effluent is discharged to Crooked Creek which lies in the Yadkin Pee Dee River Basin. Please refer to Table 3-6.



TABLE 3-1

**Twelve Mile Creek Water Reclamation Facility
 NPDES Permit #: NC0085359
 Fiscal Year: 2018-2019 Effluent Limits and Performance**

PARAMETER	LIMIT	JUL '18	AUG '18	SEP '18	OCT '18	NOV '18	DEC '18	JAN '19	FEB '19	MAR '19	APR '19	MAY '19	JUN '19
FLOW	6.0 MGD	3.26	3.21	3.73	3.59	4.50	5.33	5.04	4.39	4.36	4.20	3.77	3.68
pH	6-9 SU	7.0-7.5	6.9-7.6	7.2-7.5	7.2-7.4	6.8-7.3	6.2-7.2	6.6-7.2	6.6-7.5	6.9-7.3	7.0-7.3	6.9-7.4	6.9-7.3
BOD₅ SUMMER (APR.1 - OCT.31)	5 mg/l	0.652	0.308	1.05	0.760	-	-	-	-	-	4.52	3.59	.323
WINTER (NOV.1 - MAR.31)	10 mg/l	-	-	-	-	3.35	1.8	2.42	0.85	1.23	-	-	-
AMMONIA NITROGEN SUMMER	1 mg/l	0.04	0.307	0.006	0.009	-	-	-	-	-	0.15	.063	0
WINTER	2 mg/l	-	-	-	-	0.020	0.08	0.006	0.035	0	-	-	-
TOTAL SUSPENDED RESIDUE	30 mg/l	1.4	0.49	2.2	0.64	4.55	3.50	6.53	0.805	0.45	8.40	4.5	0
FECAL COLIFORM	200/100 ml	6.8	11.8	6.7	9.86	13.51	7.46	25.45	2.617	1.41	3.21	2.35	3.02
DISSOLVED OXYGEN	≥ 6 mg/l	8.1	8.1	8.19	8.47	9.047	9.38	9.61	9.6	9.56	9.1	8.66	8.39
COPPER	13.2 ug/l	3.6	0	0	0	4	0	0	0	0	0	3.7	3.1
ZINC	175.0 ug/l	49	57	66	0	34	32	44	49	28	50	45	49
TOTAL PHOSPHOROUS MAXIMUM MONTH	41.7 #/day	0.165	0.326	0.22	0.314	0.275	0.49	0.0458	0.125	0.38	0.82	1.146	.13
TOTAL PHOSPHORUS 12 MONTH ROLLING AVERAGE	20.85#/day	3.36	4.03	4.11	4.81	5.56	7.15	8.38	8.35	9.34	11.07	14.01	2.89

Permit Violations:

11/18 Weekly fecal; 01/19 Weekly fecal



TABLE 3-2

**Crooked Creek Water Reclamation Facility
 NPDES Permit #: NC0069841
 Fiscal Year: 2018-2019 Effluent Limits and Performance**

PARAMETER	LIMIT	JUL '18	AUG '18	SEP '18	OCT '18	NOV '18	DEC '18	JAN '19	FEB '19	MAR '19	APR '19	MAY '19	JUN '19
FLOW	1.900 MGD	0.97	.922	1.10	1.10	1.45	0.69	1.08	1.55	1.49	1.47	1.06	1.16
pH	6-9 SU	6.9-7.9	6.4-8.1	6.7-7.6	6.6-7.5	7.0-7.5	6.7-7.4	6.9-7.7	6.8-7.6	6.9-7.6	7.0-7.7	7.0-7.6	7.0-7.4
Cl₂	17 ug/l	0	0	0	0	0	0	0	0	0	0	0	0
BOD₅	5 mg/l	1.94	0.98	0.525	0.97	-	-	-	-	-	0.17	0.74	0.74
SUMMER (APR.1 - OCT.31)													
WINTER (NOV.1 - MAR.31)	10 mg/l	-	-	-	-	1.46	2.2	18.07	0.16	0	-	-	-
AMMONIA NITROGEN	2 mg/l	0	0.026	0.04	0.024	-	-	-	-	-	0	0	0.009
SUMMER													
WINTER	4 mg/l	-	-	-	-	0.012	0	0.03	0.009	0	-	-	-
TOTAL SUSPENDED RESIDUE	30 mg/l	11.96	6.78	3.72	7.96	4.19	4.89	51.43	2.03	0	0	0	0.84
FECAL COLIFORM	200/100 ml	65.83	159.51	43.45	42.14	13.62	5.96	7.3	3.04	2.08	29.73	2.37	20.16
DISSOLVED OXYGEN	≥ 6 mg/l	8.08	7.83	8.2	8.74	9.53	10.07	10.15	10.14	10.32	9.47	8.63	8.39

Permit Violations:

10/18 Weekly BOD, Weekly TSS, Weekly Ammonia ; 01/19 Weekly & Monthly BOD, Weekly & Monthly TSS, Monthly TSS Removal ; 04/19 Weekly BOD



TABLE 3-3

Hunley Creek Wastewater Treatment Plant
NPDES Permit #: NC0072508
Fiscal Year: 2018-2019 Effluent Limits and Performance

PARAMETER	LIMIT													
FLOW	0.231 MGD	<p align="center"> Hunley Creek WWTP is currently not in service. This facility was listed as inactive as of May 2006; therefore, there is no data reported for this fiscal year </p>												
pH	6-9 SU													
Cl ₂	20 ug/l													
BOD ₅	5 mg/l													
SUMMER (APR.1 - OCT.31)														
WINTER (NOV.1 - MAR.31)	10 mg/l													
AMMONIA NITROGEN	2 mg/l													
SUMMER														
WINTER	4 mg/l													
TOTAL SUSPENDED RESIDUE	30 mg/l													
FECAL COLIFORM	200/100 ml													
DISSOLVED OXYGEN	≥ 5 mg/l													
Permit Violations: No violations for fiscal year														



TABLE 3-4

**Olde Sycamore Water Reclamation Facility
 NPDES Permit #: WQ0011928
 Fiscal Year: 2018-2019 Effluent Limits and Performance**

PARAMETER	LIMIT	JUL '18	AUG '18	SEP '18	OCT '18	NOV '18	DEC '18	JAN '19	FEB '19	MAR '19	APR '19	MAY '19	JUN '19
FLOW	0.150 MGD	0.042	.038	.049	.054	.071	.071	.068	.061	.061	.056	.047	.052
pH	6-9 SU	6.0-7.7	6.4-7.6	7.0-7.5	6.5-7.6	6.7-7.7	6.9-7.5	6.8-7.6	6.7-7.5	6.6-7.3	6.6-7.5	6.6-7.7	6.8-7.3
BOD ₅	10 mg/l	0	0	0	0	1.0	2.2	0	0	5.2	0	0	0
AMMONIA NITROGEN	4 mg/l	0	0	0	0	0	0	0	0	1.06	0	0	0
TOTAL SUSPENDED RESIDUE	5 mg/l	0	0	0	0	0	1.4	0	0	0	0	0	0
FECAL COLIFORM	14/100 ml	2	1	2	1	1	1	1	1	1	1	0	0
TURBIDITY	≤ 10 NTU	0.2	.2	.5	.5	1.8	1.8	.8	.4	.5	.5	.5	.022

Permit Violations:

There were no reportable violations for the year



TABLE 3-5

**Tallwood Estates Wastewater Treatment Plant
 NPDES Permit #: NC0069523
 Fiscal Year: 2018-2019 Effluent Limits and Performance**

PARAMETER	LIMIT	JUL '18	AUG '18	SEP '18	OCT '18	NOV '18	DEC '18	JAN '19	FEB '19	MAR '19	APR '19	MAY '19	JUN '19
FLOW	0.050 MGD	.014	.013	.025	.035	.063	.080	.073	.067	.051	.053	.024	.020
pH	6-9 SU	6.7-7.7	6.6-7.7	7.1-7.8	7-7.7	7.0-7.7	7.3-7.6	6.9-7.6	7.2-7.5	7.6-7.9	6.9-7.8	7.2-7.6	7.1-7.6
BOD₅	5 mg/l	0	1.8	0	0	-	-	-	-	-	0	0	0
SUMMER(APR 1-OCT 31)													
WINTER (NOV.1 - MAR.31)	10 mg/l	-	-	-	-	0	0	0	0	0	-	-	-
AMMONIA NITROGEN	2 mg/l	0	0	0	.06	-	-	-	-	-	.028	0	0
SUMMER													
WINTER	4 mg/l	-	-	-	-	.075	0	0	0.407	0	-	-	-
TOTAL SUSPENDED RESIDUE	30 mg/l	0	0	0	0	0	.06	0	0	0	0	0	1.77
FECAL COLIFORM	200/100 ml	1	1.14	1.96	1	5.7	1	1	1	1	1.64	1	1
DISSOLVED OXYGEN	≥ 6 mg/l	6.9	7.1	7.23	7.18	7.95	9.05	10.6	10.43	9.94	8.84	7.87	8.27

Permit Violations: 08/18 Weekly BOD ; 11/18 Monthly Flow ; 12/18 Monthly Flow ; 01/19 Monthly Flow ; 02/19 Monthly Flow ; 03/19 Monthly Flow



TABLE 3-6

**Grassy Branch Wastewater Treatment Plant
NPDES Permit #: NC0085812
Fiscal Year: 2018-2019 Effluent Limits and Performance**

PARAMETER	LIMIT	JUL '18	AUG '18	SEP '18	OCT '18	NOV '18	DEC '18	JAN '19	FEB '19	MAR '19	APR '19	MAY '19	JUN '19
FLOW	0.050 MGD	.05	.033	.050	.056	.087	.106	.081	.070	.067	.064	.040	.031
pH	6-9 SU	6.7-8.0	6.8-7.5	6.9-7.6	7.0-7.5	7.0-8.0	7.1-9.9	7.0-8.8	6.3-7.7	6.6-7.6	7.3-7.9	7.1-7.8	6.9-7.6
Cl ₂	17 ug/l	0	0	0	0	0	0	0	0	0	0	0	0
BOD ₅	5 mg/l	.42	0	2.07	1.36	-	-	-	-	-	24.8	1.05	0
SUMMER (APR.1 - OCT.31)													
WINTER (NOV.1 - MAR.31)	10 mg/l	-	-	-	-	4.37	8.12	7.64	6.82	5.27	-	-	-
AMMONIA NITROGEN	2 mg/l	.02	.125	.825	.182	-	-	-	-	-	2.04	1.32	0
SUMMER													
WINTER	4 mg/l	-	-	-	-	.382	4.86	1.05	1.52	1.57	-	-	-
TOTAL SUSPENDED RESIDUE	30 mg/l	3.12	2.4	5.35	1.3	1.27	7.6	8.7	5.3	7.9	22.3	0	0
FECAL COLIFORM	200/100 ml	12.37	11.42	243.8	87.62	171.54	1448.5	12.38	67.22	5.63	14.09	7.45	1.73
DISSOLVED OXYGEN	≥ 6 mg/l	7.04	7.06	7.61	8.5	8.23	30.5	12.25	11.09	10.43	9.02	8.27	8.56

Permit Violations: 09/18 Monthly Flow, Monthly Fecal ; 10/18 Monthly Flow, 3 Weekly Fecal ; 11/18 Monthly Flow, 2 Weekly Fecal ; 12/18 Monthly Flow, Monthly & Weekly BOD, Monthly & Weekly Ammonia ; 01/19 Monthly Flow, Weekly BOD, Weekly Fecal ; 02/19 Monthly Flow, Weekly Fecal ; 03/19 Monthly Flow Heavy rainfall for several months resulted in repeated plant upsets which contributed to several compliance violations. Inflow and infiltration remediation work carried out by UCPW staff has greatly reduced the chance of this occurring again.



4.0 BIOSOLIDS MANAGEMENT (Fiscal Year 2018-2019)

Biosolids are managed and disposed of in accordance with Permit No's. WQ0007486 issued by the North Carolina Department of Environmental Quality and ND0089044 issued by South Carolina Department of Health and Environmental Control. Biosolids are stored at both the Crooked Creek and Twelve Mile Creek WRFs. The solids are aerobically digested and then applied as "fertilizer" to permitted sites. The solids are considered stabilized and thus suitable for land application when the volatile solids content is reduced by 38%. If this 38% volatile solids reduction cannot be achieved, then alkaline stabilization, injection or incorporation is employed to insure permit compliance. Union County Public Works, through its biosolids contractor, land applied approximately 7.05 million gallons of biosolids, which equates to 1,153 dry tons.

What Are Biosolids?

Biosolids are the nutrient-rich, organic by-product of the wastewater treatment process. When treated and managed appropriately, they can be beneficially used for a number of purposes, such as a fertilizer to improve and maintain productive soils and stimulate plant growth. Biosolids are one of the most studied materials that have ever been regulated by the U.S. Environmental Protection Agency (USEPA).



5.0 SYNOPSIS OF WASTEWATER COLLECTION SYSTEM (Fiscal Year 2018-2019)

Permit No. WQCS00054. UCPW currently operates and maintains over 700 linear miles of sewer mains, including force mains, and 80 wastewater pumping stations providing service to population of approximately 106,923 customers. All pump stations are equipped with both audible and visual alarms as well as either automated telephone dialers (ATD) or telemetry which alert staff when alarm conditions are present. Inspections of all pump stations meet or exceed State requirements. Emergency auxiliary power is provided to all stations via portable or permanent mounted generators. Union County personnel are on call rotation and available 24 hours a day, 7 days a week, and 365 days a year.

Public Works is required by State permit to clean a minimum of 10% of the collection system annually to prevent and/or reduce backups and overflows. Staff has consistently surpassed that requirement, cleaning more than the required 10%. UCPW cleaned approximately 11% (66.52 miles of 622 total gravity miles) of the collection system last year. Staff also conducts inspections of the collection system with the utilization of underground closed-circuit television (CCTV) inspection equipment. These cleaning and inspection efforts allow staff to determine areas in the system that require repairs or increased maintenance to provide the proper service to our customers. During 2019 staff has implemented an off-street cleaning team to address areas remote areas of the system.

FOG (Fats, Oils, and Grease) program is aimed at reducing grease-related back-ups and overflows by educating the public of the hazards associated with the disposal of grease and grease related by-products into the wastewater system. Union County Public Works has also developed a comprehensive list of food service establishments (FSE) and commercial establishments. This effort has resulted in developing an important and successful grease trap inspection and enforcement program ensuring that restaurants and other food preparation facilities properly maintain grease traps and interceptors.

This fiscal year, 350 of 350 FSEs have been inspected, including 34 Union County public school facilities.

	FEET	MILES	SYSTEM TOTAL (In Miles)
SEWER LINES CLEANED	351,252	66.52	622
SMOKE TESTING	82,565	15.6	622
EASEMENT MAINTENANCE	502,248.3	95.12	124



	INSPECTED	SYSTEM TOTAL
Manhole Inspections	578	15,306
Pump Station Inspections	4,632	N/A
CCTV Connections	1,564	N/A
Point Repairs	219	N/A

Utility easements and right-of-ways are maintained by UCPW staff to ensure access for staff and equipment to conduct routine maintenance as well as respond to emergencies, such as sanitary sewer overflows. The easements require round-the-clock access and should not be impeded by structures such as pools (above or below ground), buildings, etc. as well as gardens, trees, shrubs, plantings, fences, etc. Public Works staff inspects and conducts necessary maintenance, including mowing, to these easements and right-of-ways once a year.

An Easement Awareness, Education, and Enforcement Program has been established to improve accessibility to UCPW's sanitary sewer easements. This is accomplished by educating customers on the allowable uses of the easement and describing prohibitions, as well as procedures regarding enforcement when it is required for access.

High priority lines such as aerial creek crossings, lines subject to erosion and/or problematic areas are visually inspected at a minimum semi-annually. High priority lines are inspected more frequently after periods of heavy rain and flooding.

UCPW maintains emergency response equipment in a ready state at all times. This emergency equipment varies in nature from spare electrical parts and plumbing supplies, to vacuum trucks, pumps, and backhoes. Workers safety is of utmost importance. Safety equipment such as night lighting, gas monitors, trenching and shoring equipment, and reflective cones/signs are always readily available.

UCPW continuously works to improve its infrastructure and service provided to its customers. This involves consistent inspections and system examinations to ensure that our system is operating properly. Additionally, Union County has Capital Improvement Projects (CIP) to identify and correct deficiencies within the wastewater system. Below is a sample of projects:





12 Mile Creek WRF Expansion

Union County Public Works is in the process of upgrading the 12 Mile Creek Water Reclamation Facility. The project involves various advancements to the plant, taking the treatment capacity from 6.0 million gallons per day (MGD) to 7.5 MGD.

These improvements will increase the treatment capacity of the plant to meet future short-term anticipated wastewater flows. The proposed improvements will also prepare the facility for future expansions: first to 9.0 MGD, and then to 12.0 MGD. These expansion projects will meet the projected long-term wastewater treatment needs for the southwestern portion of the County.

The expansion project includes:

- Upgrade and expansion of the influent pump station
- Replacement of the existing preliminary treatment facility with a new grit removal and odor control system
- Conversion of the existing biological treatment process to a diffused aeration system to enhance biological nutrient removal and provide additional capacity
- Replacement of the effluent disinfection system with a new high efficiency ultraviolet disinfection process
- Construction of a new residuals handling facilities which serves to stabilize and dewater the residual solids produced in the treatment process

The County awarded the contract to Adams Robinson Enterprises, Inc. in the amount of \$36,673,000.00, which is the County's largest capital improvement project in the last two decades.

Construction began September 2016 and is targeted for completion in fall of 2019.

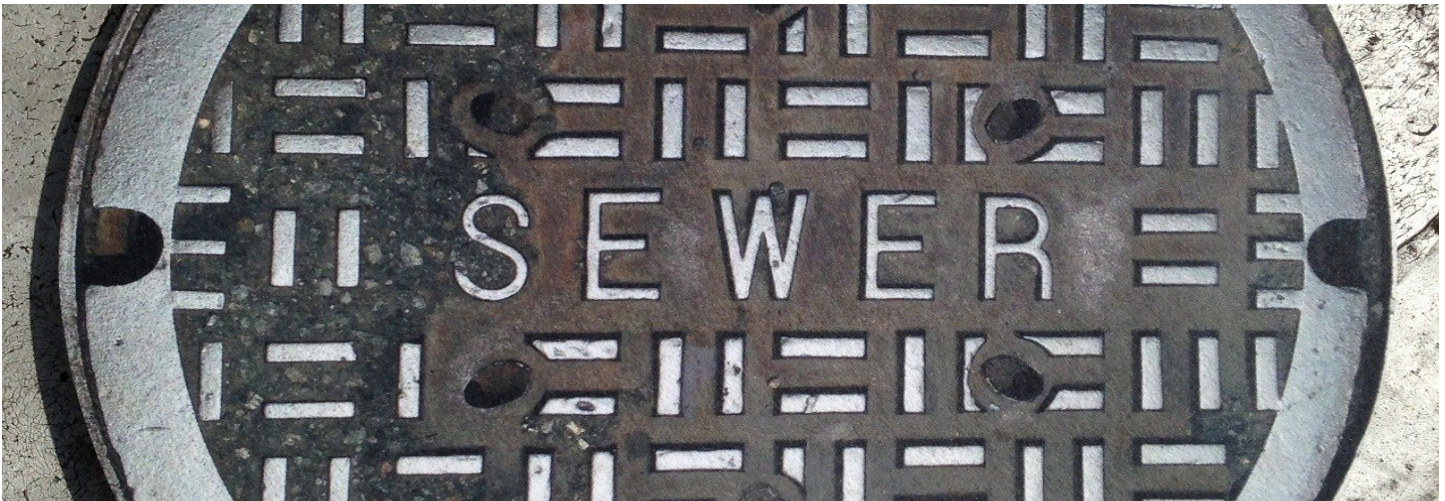




Ongoing Sanitary Sewer Evaluation Studies

Studies are being done throughout the collection system to identify problems, conduct flow monitoring, and need for rehabilitation.

- Tallwood WRF basin – A contract was issued to address inflow and infiltration (I&I) repairs needed in this basin. The work was completed in June of the FY19 budget year.
- Crooked Creek WRF Basin – A significant I&I study has been underway since FY17. The project has identified areas of I&I entering the system and a contract was issued to repair these defects. The work started in FY19 with the use of CIP funds.
- Grassy Brach WRF Basin – UCPW has worked extensively with UCPS staff to eliminate Sanitary Sewer Overflows (SSOs) in the basin. During FY18 Piedmont High School completed construction repairs during summer break to reduce I&I. Efforts are continuing into FY20 to continually reduce the impacts of I&I. We currently have 5 micro meters installed to monitor any I&I during FY19/20. 42 manholes were repaired during FY19 along the trunk line to the WRF with the use of chemical grout.



Crooked Creek WRF Headworks Improvements

The project was completed in May 2019. The project includes the construction of a new headworks facility, influent pump station, three million gallon flow equalization tank, and appurtenant yard piping, mechanical, and electrical system improvements. Construction of the flow equalization tank allows for greater operational control of the facility and offsets the need to expand treatment capacity to handle peak flows that occur on an irregular basis or for short time periods during any given day. Improvements to the headworks and influent pumping facilities ensure adequate capacity to convey incoming flows is available and reduces the risk of sanitary sewer overflows at the plant site and in the upstream collections system.



During the Fiscal Year 2018-2019, Union County's wastewater system collected and conveyed approximately 3.66 billion gallons of wastewater. There were fifteen (36) sanitary sewer overflows with a combined estimated volume of 151,572 gallons that occurred within the collection system. Union County Public Works conveyed 99.996% of the total volume of wastewater without incident.

Sanitary Sewer Overflow Report

DATE	MH ID#	ADDRESS	WATER BODY	VOUME DATA		TOTAL VOLUME (GALS)	PRIMARY CAUSE OF SSO	SECONDARY CAUSE OF SSO (IF ANY)
				GALLONS TO SURFACE WATERS	GALLONS ON GROUND			
09/05/18	2433	14600 E Independence Blvd	No Water Body Affected	0	450	450	Debris in line	
09/16/18	2700	4720 Monroe Ansonville Rd	Meadow Branch	6,420		6,420	Hurricane Florence	Inflow
09/16/18	Funderburk Pump Station	630 Funderburk Rd	Spring Branch	2,175	0	2,175	Hurricane Florence	Inflow
09/16/18	7456	910 Sharon Dr	Rone Branch	13,500	0	13,500	Hurricane Florence	Inflow
09/16/18	2724-2728	1629 Old Fish Rd	Grassy Branch	16,250	0	16,250	Hurricane Florence	Inflow
09/16/18	3196	6737 First Ave	Crooked Creek	2,100	0	2,100	Hurricane Florence	Inflow
09/16/18	6384	5502 Poplin Rd	North Fork Crooked Creek	23,250	0	23,250	Hurricane Florence	Inflow
09/16/18	3521-3522	3411 Brooktree Ln	South Fork Crooked Creek	10,800	0	10,800	Hurricane Florence	Inflow
09/16/18	3202	4611 Jacqueline Dr	South Fork Crooked Creek	1,650	0	1,650	Hurricane Florence	Inflow
09/16/18	2707	3826 Monroe-Ansonville Rd	Rays Fork	1,575	0	1,575	Hurricane Florence	Inflow
09/16/18	2646	1409 Hwy 205	Salem Creek	2,250	0	2,250	Hurricane Florence	Inflow
09/16/18	Suburban Estates 1 Pump Station	100 Blackvine Dr	South Fork Crooked Creek	4,050	0	4,050	Hurricane Florence	Inflow
09/16/18	5231	4015 Sardis Church Rd	Crooked Creek	3,350	0	3,350	Hurricane Florence	Inflow
10/11/18	Meadows #1 Pump Station	700 Penny Ln	Austin Branch	0	300	300	Hurricane Michael	Inflow
10/11/18	Olde Sycamore PS #3	Olde Sycamore PS #3	Duck Creek	0	207	207	Hurricane Michael	Inflow
11/12/18	Funderburk Pump Station	630 Funderburk Rd	Spring Branch	780	0	780	Severe Weather/Rain	Inflow
11/15/18	2406	4015 Sardis Church Rd	Crooked Creek	480	0	480	Severe Weather/Rain	Inflow
11/15/18	2725	1629 Old Fish Rd	Grassy Branch	14,100	0	14,100	Severe Weather/Rain	Inflow
11/26/18	30258	1026 Angora Ct	No Water Body Affected	0	450	450	Debris in line	
11/26/18	Septic Tank	205 Carl's Rd	No Water Body Affected	0	450	450	Septic Tank Failure	
12/09/18	2724	1629 Old Fish Rd	Grassy Branch	4,500	0	4,500	Severe Weather/Rain	Inflow
12/20/18	2731	1629 Old Fish Rd	Grassy Branch	2,850	0	2,850	Severe Weather/Rain	Inflow
02/09/19	14294	4048 Henshaw Rd	12mile Creek	1,000	2,000	3,000	Debris in line	
02/12/19	Loxdale Pump Station	Fallen Leaf Court	No Water Body Affected	0	225	225	Pump Failure	
02/22/19	2406	4015 Sardis Rd	Crooked Creek	900	0	900	Severe Weather/Rain	Inflow
02/26/19	Pipeline	6214 South Providence Road	Davis Branch	450	50	500	Air Relief Failure	
03/03/19	2406	4015 Sardis Rd	Crooked Creek	2,100	0	2,100	Severe Weather/Rain	Inflow
03/20/19	Eastside 3 Pump Station	1409 Hwy 205	No Water Body Affected	0	50	50	By-pass Hose Leak	
04/13/19	12563	6600 Stoney Creek	Goose Creek	13,000	500	13,500	Pump Station Failure	
04/13/19	2406	4015 Sardis Rd	Crooked Creek	12,000	0	12,000	Severe Weather/Rain	Inflow
05/18/19	Pipeline	2103 Lytton Ln	West Fork 12mile	2,960	0	2,960	Pipe Failure	
05/23/19	Pipeline	706 White Oak Drive	North Fork Crooked Creek	1,500	0	1,500	Pipe Failure	
05/28/19	Pipeline	2844 Gray Fox Rd	South Fork Crooked Creek	1,500	0	1,500	Hit Force Main	
06/01/19	Pipeline	3826 Monroe-Ansonville Rd	No Water Body Affected	0	500	500	Air Relief Failure	
06/04/19	Pipeline	3827 Monroe-Ansonville Rd	No Water Body Affected	0	500	500	Air Relief Failure	
06/20/19	Eastside 3 Pump Station	1409 Hwy 205	No Water Body Affected	0	400	400	Pump Station Failure	
36	TOTAL SPILLS	TOTAL ANNUAL VOLUMES		145,490	6,082	151,572		
		MILES OF PIPE IN SYSTEM		700				
		Reportable SSO's PER 100 MILES		4.14				



For questions concerning this Wastewater System Performance Summary or additional information please contact UCPW:

(704) 296-4210

Or write to:

Union County Public Works
500 North Main Street, Suite 600
Monroe, NC 28112-4730

This document can also be viewed at: