



UNIONCOUNTY
WATER

Wastewater
Performance
Summary Fiscal
Year 2020-2021

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Dear Customer,

We are proud to share this year's Annual Wastewater 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. The 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 regarding this report or your water, please contact us at 704.296.4210. If you want additional information, please visit our website at: www.unioncountync.gov

Sincerely,

Andy Neff

Andrew Neff, P.E.
Water & Wastewater Division Director
4600 Goldmine Road, Monroe, NC 28110



1.0 Introduction

Nature has an amazing ability to cope with small amounts of water waste 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 Water (UCW) is charged with the management, operation and maintenance of the County's sanitary sewer system. During fiscal year 2020-2021 the wastewater system was comprised of five active water reclamation facilities (WRF), 53 wastewater pumping stations, and over 721 miles of pipe with over 38,000 connections. In addition to the five WRF's, which have a combined rated treatment capacity of 9.65 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 WRF and Charlotte's McAlpine Creek WRF.

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 re- move 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 Water Reclamation Facilities (Fiscal Year 2020-2021)

During fiscal year 2020-2021 Union County Water operated and maintained a total of five (5) active water reclamation facilities and maintained one (1) inactive facility. Although each Permit requires facility visitation daily, excluding weekends and holidays, UCW’s water reclamation 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. Water reclamation facility 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 7.5 MGD of treated wastewater. Twelve Mile Creek WRF 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 WATER RECLAMATION FACILITY

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 WRF, there was no data to report to Table 3-3 for fiscal year 2020-2021.

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 WATER RECLAMATION FACILITY

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. The original Tallwood plant was replaced in 2012 with a new facility. Tallwood WRF is located within the Tallwood subdivision on Brief road. It also serves the 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 WATER RECLAMATION FACILITY

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 Schools as well as one individual residence, Loxdale Farms Subdivision, and Smith Field Subdivision. 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: 2020-2021 Effluent Limits and Performance**

Parameter	Limit	Jul '20	Aug '20	Sep '20	Oct '20	Nov '20	Dec '20	Jan '21	Feb '21	Mar '21	Apr '21	May '21	Jun '21
FLOW	6.0 MGD	4.75	4.99	5.56	5.84	5.82	6.24	6.73	7.65	5.96	5.26	5.23	5.89
pH	6-9 SU	6.9-7.5	7.0- 7.4	6.8- 7.4	6.6-7.5	6.8-7.4	6.8-7.5	7.2-7.4	7.2- 7.5	7.1- 7.5	7.3-7.6	7.3-7.6	7.2-7.6
BOD5 Summer (Apr.1 - OCT.31)	5 mg/l	3.2	4.16	3.25	3.3	-	-	-	-	-	2.85	4.81	3.72
Winter (Nov.1 - Mar.31)	10 mg/l	-	-	-	-	3.02	4.6	5.05	3.86	3.2	-	-	-
Ammonia Nitrogen Summer	1 mg/l	0.18	0.29	0.335	0.144	-	-	-	-	-	0.012	0.36	0.197
Winter	2 mg/l	-	-	-	-	0.087	0.782	1.43	1.82	0.04	-	-	-
Total Suspended Residue	30 mg/l	1.88	3.69	3.93	3.14	3.06	5.36	4.47	-	3.90	2.65	6.40	4.00
Fecal Coliform	200/100 ml	1.59	2.6	1.86	2.62	1.28	1.43	1.92	1.0	1.00	1.0	1.48	1.38
Dissolved Oxygen	> 6 mg/l	8.32	8.2	8.30	8.55	8.83	9.21	9.50	9.65	9.57	9.16	8.84	8.57
Copper	13.2 ug/l	-	4.9	-	-	-	-	-	-	-	-	3.5	-
Zinc	175.0 ug/l	-	56	-	-	-	-	-	-	-	-	4	-
Total Phosphorous Maximum Month	41.7 #/day	10.97	23.43	12.98	14.61	14.82	8.07	12.93	0.22	14.44	9.22	17.04	12.70
Total Phosphorus 12 Month Rolling Average	20.85#/ day	17.29	18.73	18.5	19.14	19.8	18.99	17.85	14.0	15.89	13.93	13.71	13.77

Permit Violations: February 2021 violation for exceeding monthly flow limit

Table 3-2

Crooked Creek Water Reclamation Facility
NPDES Permit #: NC0069841
Fiscal Year: 2020-2021 Effluent Limits and Performance

Parameter	Limit	Jul '20	Aug '20	Sep '20	Oct '20	Nov '20	Dec '20	Jan '21	Feb '21	Mar '21	Apr '21	May '21	Jun '21
FLOW	1.900 MGD	1.02	1.00	1.06	1.08	0.95	1.15	1.18	1.58	1.07	0.83	0.76	0.86
pH	6-9 SU	6.8-7.3	6.8- 7.4	6.8- 7.5	6.9-7.4	7.0-7.4	6.9-7.5	7.0-7.6	6.8-7.5	7.0-7.5	7.0-7.4	6.8-7.4	6.8-7.5
Cl ₂	17 ug/l	0	0	0	0	0	0	0	0	0	0	0	0
BOD5 Summer (Apr.1 - OCT.31)	5 mg/l	0.61	0.14	0	2.55	-	-	-	-	-	1.4	0.99	1.50
Winter (Nov.1 - Mar.31)	10 mg/l	-	-	-	-	0.46	0	0.72	1.6	0.93	-	-	-
Ammonia Nitrogen Summer	2 mg/l	0	0	0	0	-	-	-	-	-	0	0	0
Winter	4 mg/l	-	-	-	-	0	0.01	0	0.04	0.01	-	-	-
Total Suspended Residue	30 mg/l	0	0.22	0.31	2.17	0.27	0.20	0.21	3.74	0	1.10	0.98	3.56
Fecal Coliform	200/100 ml	1.46	2.74	1.71	2.45	3.63	1.81	1.21	1.18	1.70	1.0	1.39	4.83
Dissolved Oxygen	> 6 mg/l	7.99	8.04	8.2	8.50	9.40	9.96	10.47	10.39	10.10	9.66	8.77	8.22

Permit Violations: During the term 2020 violated permit requirement for Ammonia Corrective Action Plan/ May 2021 Failed to monitor for Total Phosphorus and Total Nitrogen.

Table 3-3

Hunley Creek Water Reclamation Facility
NPDES Permit #: NC0072508
Fiscal Year: 2020-2021 Effluent Limits and Performance

Parameter	Limit
FLOW	0.231 MGD
pH	6-9 SU
Cl ₂	20 ug/l
BOD5 Summer (Apr.1 - OCT.31)	5 mg/l
Winter (Nov.1 - Mar.31)	10 mg/l
Ammonia Nitrogen Summer	2 mg/l
Winter	4 mg/l
Total Suspended Residue	30 mg/l
Fecal Coliform	200/100 ml
Dissolved Oxygen	> 5 mg/l

Hunley Creek WRF 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.

Permit Violations: There were no violations during this period.

Table 3-4

Olde Sycamore Water Reclamation Facility
NPDES Permit #: WQ0011928
Fiscal Year: 2020-2021 Effluent Limits and Performance

Parameter	Limit	Jul '20	Aug '20	Sep '20	Oct '20	Nov '20	Dec '20	Jan '21	Feb '21	Mar '21	Apr '21	May '21	Jun '21
FLOW	0.150 MGD	0.040	.041	.037	.039	.044	.049	.050	.055	.035	.030	.030	.028
pH	6-9 SU	6.9-7.4	7.1- 7.4	7.0-7.6	7.0-7.3	7.0-7.4	6.7-7.3	6.7-7.4	6.0-7.0	6.9-7.3	6.8 -7.4	6.8 -7.4	6.7-7.3
BOD5	10 mg/l	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	4 mg/l	<0.10	0.14	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	<0.10	<0.10	0.02
Total Suspended Residue	5 mg/l	<2.7	<2.6	<2.6	<2.6	<2.6	<2.6	<2.6	<2.6	<2.6	<2.6	<2.6	<2.6
Fecal Coliform	14/100 ml	1	2.2	1	1	1	1	1	7	<1	<1	<1	<1
Turbidity	> 10 NTU	0.2	.3	.3	.3	0.3	0.3	.4	1.6	.6	.6	.6	.3

Permit Violations: In February 2021 there was one violation for exceeding the daily fecal coliform limit.

Table 3-5

Tallwood Estates Water Reclamation Facility
NPDES Permit #: NC0069523
Fiscal Year: 2020-2021 Effluent Limits and Performance

Parameter	Limit	Jul '20	Aug '20	Sep '20	Oct '20	Nov '20	Dec '20	Jan '21	Feb '21	Mar '21	Apr '21	May '21	Jun '21
FLOW	0.050 MGD	.017	.018	.024	.030	.030	.041	.047	.072	.039	.022	.016	.017
pH	6-9 SU	7.0-7.5	7.3-7.5	7.1-7.7	7.4-7.7	7.1-7.4	7.1-7.4	6.5-7.5	6.8-7.6	7.2-7.7	7.3-7.6	7.4-7.7	7.3-7.5
BOD5 Summer (Apr.1 - OCT.31)	5 mg/l	0	0	0	0	-	-	-	-	-	0	0	0
Winter (Nov.1 - Mar.31)	10 mg/l	-	-	-	-	0	0	0	0	0	-	-	-
Ammonia Nitrogen Summer	2 mg/l	0	0	0	0	-	-	-	-	-	0	0.07	0
Winter	4 mg/l	-	-	-	-	0	0.04	0	0	0	-	-	-
Total Suspended Residue	30 mg/l	0	0	0	0	0	0	0	0	0	0	0	0
Fecal Coliform	200/100 ml	1	1	1	1	1	1	2.0	6.4	2.2	1	1	1
Dissolved Oxygen	> 6 mg/l	7.38	7.53	7.74	8.33	8.53	9.44	10.02	9.87	9.56	8.84	8.23	8.0

Permit Violations: May 2021 Failed to monitor for Total Nitrogen and Total Phosphorus.



Table 3-6

**Grassy Branch Water Reclamation Facility
 NPDES Permit #: NC0085812
 Fiscal Year: 2020-2021 Effluent Limits and Performance**

Parameter	Limit	Jul '20	Aug '20	Sep '20	Oct '20	Nov '20	Dec '20	Jan '21	Feb '21	Mar '21	Apr '21	May '21	Jun '21
FLOW	0.050 MGD	.011	.026	.054	.060	.051	.077	.089	.103	.055	.031	.030	.022
pH	6-9 SU	6.5-7.4	7.3-7.6	7.1- 7.5	7.0-7.4	7.0-7.3	7.1-7.5	6.5-7.3	6.5-7.4	6.7-7.2	6.8-7.4	6.9-7.1	7.0-7.6
Cl ₂	17 ug/l	0	0	0	0	0	0	0	0	0	0	0	0
BOD5 Summer (Apr.1 - OCT.31)	5 mg/l	1.2	0	0	1.3	-	-	-	-	-	4.2	3.02	.52
Winter (Nov.1 - Mar.31)	10 mg/l	-	-	-	-	0.2	2.3	3.00	6.4	3.32	-	-	-
Ammonia Nitrogen Summer	2 mg/l	0	0	0	0	-	-	-	-	-	0.04	0.33	0
Winter	4 mg/l	-	-	-	-	0	0	0	0	0	-	-	-
Total Suspended Residue	30 mg/l	0	0	0	2.02	0.92	4.2	0	8.37	6.04	7.0	5.77	1.26
Fecal Coliform	200/100 ml	1	2.04	1	.4	1.56	.66	2.21	5.73	3.24	2.11	1.6	1.6
Dissolved Oxygen	> 6 mg/l	8.07	8.35	7.6	8.4	9.35	11.02	11.7	11.17	10.0	9.4	9.22	8.3

Permit Violations: From September 2020 - March 2021, the monthly flow limit was exceeded.

4.0 Biosolids Management (Fiscal Year 2020-2021)

Portions of the biosolids are managed and disposed of in accordance with Permit No. ND0089044 issued by the South Carolina Department of Health and Environmental Control. 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 ensure permit compliance. Union County Water, through its biosolids contractor, land applied approximately 7.44 million gallons of biosolids. Union County also mechanically dewatered 4,546 tons of biosolids and disposed of them in the Anson Regional landfill.



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 2020-2021)

Permit No. WQCS00054. UCW currently operates and maintains over 721 linear miles of sewer mains, including force mains, and 53 wastewater pumping stations that provide service to over 38,000 accounts. 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.

Union County Water 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%. UCW cleaned approximately 12.73% (82.41 miles of 647.5 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.

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 Water has also developed a comprehensive list of food service establishments (FSE) and commercial establishments. This effort has resulted in creating a successful grease trap inspection and enforcement program to ensure that restaurants and other food preparation facilities properly maintain grease traps and interceptors.

This fiscal year, 446 of 446 FSEs have been inspected, including 34 Union County public school facilities.

	Feet	Miles	System Total (In Miles)
Sewer Lines Cleaned	435,174	82	721
Smoke Testing	25,924	4.9	721
Easement Maintenance	1,222,848	231	165



Utility easements and right-of-ways are maintained by UCW 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, gardens, trees, shrubs, plantings, fences, etc. UCW 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 UCW'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.

UCW 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.

UCW 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. The following pages include an overview of some of these projects:

	Inspected	System Total
Manhole Inspected	778	17,361
Pump Station Inspections	3368	N/A
CCTV Connections	1601	N/A
Point Repairs	234	N/A

12 Mile Creek WRF Expansion

Union County Water has completed the upgrades to the 12 Mile Creek Water Reclamation Facility. The project involved various advancements to the plant, taking the treatment capacity from 6.0 million gallons per day (MGD) to 7.5 MGD.

These improvements have increased the treatment capacity of the plant to meet future short-term anticipated wastewater flows. The improvements have also prepared 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

Construction began September 2016 and was completed in the spring of 2020.

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 and reduces the risk of sanitary sewer overflows at the plant site and in the upstream collections system.

Ongoing Sanitary Sewer Evaluation Studies

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

Master Plan Study - Currently we have a comprehensive masterplan being conducted. As part of that plan, we have installed 27 flow meters throughout the entire system to model flows. The data from those meters will direct SSES efforts for FY21/22 year.

Poplin Road Basin - Fairfield Plantation was completely rehabilitated to include mainline and manhole repairs. The post-rehab work was CCTV'd to confirm all necessary improvements had been completed. The project was completed in April 2021.

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, and is ongoing. I&I reduction project in Basins 12 and 13 is underway. The project consists of point repairs to existing sewer laterals and manhole rehab work. Projected completion date is estimated to be October 2021.

Grassy Brach WRF Basin - UC Water 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. During FY20/21 we had multiple micrometers installed to monitor any I&I in the system. For FY21/22 a plan is in place with an outside vendor to preform CCTV of the entire collection system. The Unionville Pump Station was also redesigned and rebuilt.

Six Mile Basin - During FY20/21 an in-depth flow monitor study was completed. That study comprised of 12 flow meters that monitored flow during dry and wet weather flow. This data is being reviewed to direct SSES work and rehabilitation of found defects.

Eastside Basin - In Fall of 2020 contractors lined approximately 2,550 LF of 24-inch, 18-inch, and 15-inch gravity sewer along Monroe Ansonville Road.

12 Mile Basin - During FY 20/21 a CCTV project was completed of our 42" main trunk sewer. From this work, a rehab project was issued to rehab a portion of that main to abate I&I in the system. In Spring of 2020 Contractors lined approximately 1,500 LF of 8-inch gravity sewer in Waxhaw along Waxhaw Parkway, W South Main Street, and Rehobeth Road.

Sanitary Sewer Overflow Report

Start Date	MH or Main Asset ID	Address	Water Body	Gal to Surface Waters	Gal on Ground	Total Gallons	Primary Cause	Secondary Cause
2020-07-24	30519	4009 Shadow Brook Rd.	12 Mile Creek Tributary 7	3150	0	3150	Debris	Blockage
2020-09-24	ARV # 2210	Monroe Ansonville Rd.(ARV Near Piney Grove Baptist Church)	NO Water Body Affected	0	240	240	Air Release Valve Failure	Pump Station Equipment
2020-10-11	4534	2706 Bobwhite Cir.	Rays Fork	525	0	525	Grease	Blockage
2020-10-19	Hunley Creek Lift Station	6600 Stoney Creek Dr.	Goose Creek	450	0	450	Pump Station Equipment	Power Outage
2020-10-20	FM at Kensington Dr. and Wxw-Marvin Rd. Intersection	8200 Kensington Dr.	12 Mile Creek	800	3750	4550	Line Break	3rd Party Damage
2020-11-12	Western Union Lift Station	5304 Lee Massey Rd.	NO Water Body Affected	0	245	245	I&I	Severe Weather
2020-11-12	Suburban Estates #3 Lift Station	5806 Sunnywood Place	NO Water Body Affected	0	195	195	I&I	Severe Weather
2020-11-12	5231, 5223, 5222	4004 Sardis Church Rd.	South Fork Crooked Creek	23,255	0	23255	I&I	Severe Weather
2020-11-12	2646	1909 Hwy. 205(Eastside #3)	Salem Creek	1,825	0	1825	I&I	Severe Weather
2020-11-12	Marvin Ridge Lift Station	2831 Crane Rd.	Tarkhill Branch	5,400	0	5400	I&I	Severe Weather
2020-11-12	1747	1509 Chandlers Field Dr.	East Fork 12 Creek	3,300	0	3300	I&I	Severe Weather
2020-12-25	12042	4401 Marys Point Rd.	NO Water Body Affected	0	800	800	Grease	Blockage
2021-01-11	Loxdale Lift Station	2715 Falling Leaf Ct.	NO Water Body Affected	0	20	20	Line Break	
2021-02-02	21-25 Lift Station	910 Sharon Dr.	NO Water Body Affected	0	40	40	Pump Station Equipment	Power Outage
2021-02-10	ARV #	2856 Gray Fox Rd.(ARV for Helmsville Lift Station)	South Fork Crooked Creek	500	0	500	Air Release Valve Failure	Pump Station Equipment
2021-02-23	30529	2497 Creekview Dr.	NO Water Body Affected	0	170	170	Debris	Blockage
2021-02-28	6384	7001 Sedgewick Rd.(Poplin Rd. Lift Station)	North Fork Crooked Creek	150	150	300	Blockage	N/A
2021-05-18	Funderburk Lift Station	610 Funderburk Rd.	NO Water Body Affected	0	100	100	3rd Party Damage	N/A
2021-05-29	1741	398 Birmingham Ln.	East Fork 12 Creek	150	1850	2000	Blockage	N/A
2021-06-20	Suburban Estates #3 Lift Station	6124 DayBreak Dr.	NO Water Body Affected	0	440	440	I&I	Severe Weather
2021-06-20	5222, 5223, 5231, 16272,	4015 Sardis Church Rd.	South Fork Crooked Creek	12,280	0	12280	I&I	Severe Weather
2021-06-21	2078	7809 Stonehaven Dr. on the sewer outfall	West Fork 12 Mile Tributary 1	300	75	375	Roots	Debris
2021-06-23	FM at Helmsville Lift Station	2844 Gray Fox Rd.	South Fork Crooked Creek	40	120	160	Line Break	Pump Station Equipment
				52,125	8195	60320		

Total Spills: 23

Total Annual Volume: 60,320 Gallons

Miles of Pipe in System: 721

Reportable SSOs Per 100 Miles: 1.94



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

704.296.4210 Or write to: Union County Water
500 North Main Street, Suite 600
Monroe, NC 28112-4730



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