Metropolitan Sewerage District of Buncombe County

System Performance Annual Report

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Asheville, North Carolina 28804

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Director of System Services (Collection System)	Mike Stamey, P.E. (ORC)	(828) 225-8262

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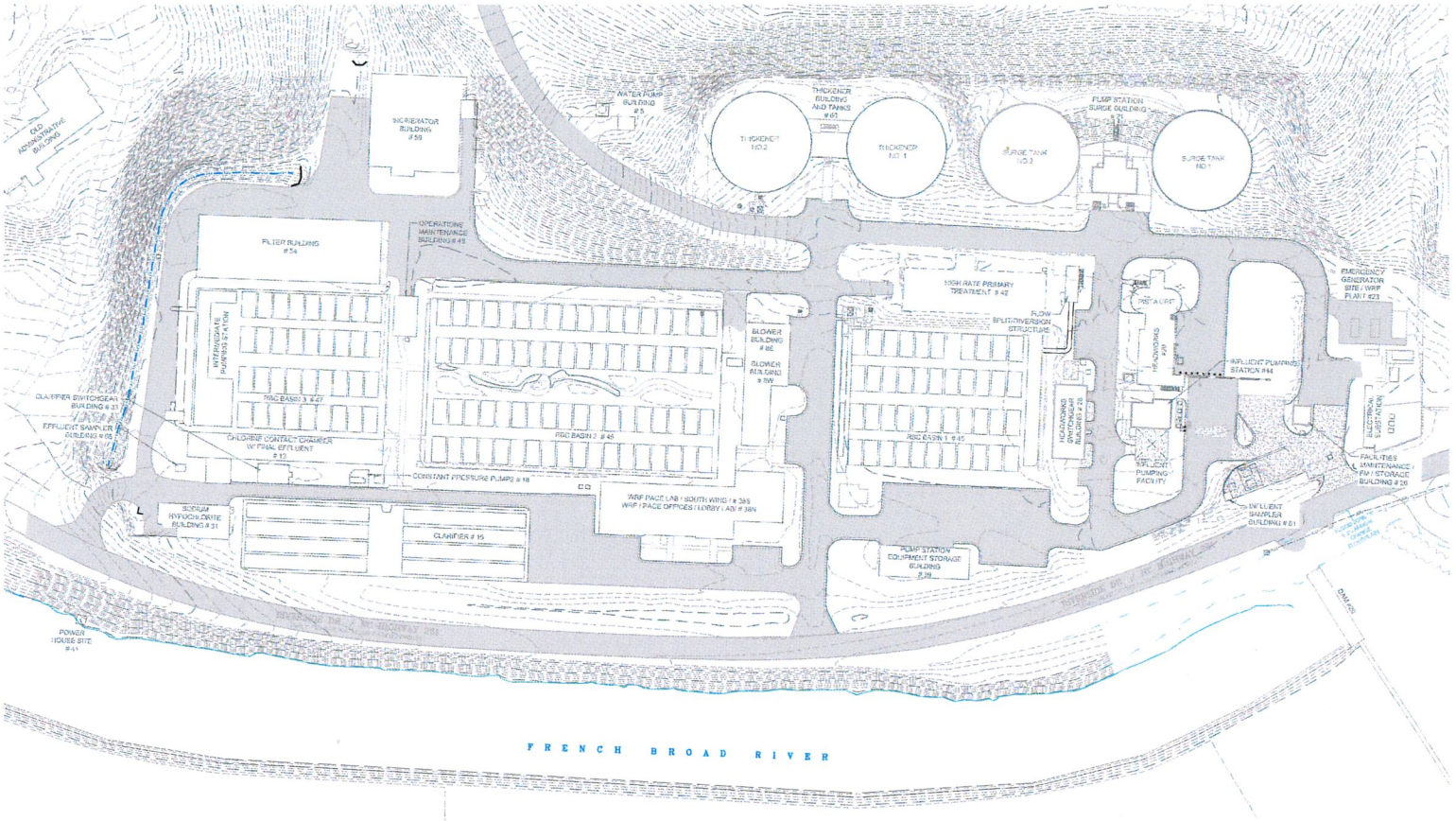
System Performance Annual Report

Fiscal Year 2025 (July 2024 - June 2025)

I. General Information



Permit Numbers:

NPDES Permit # NC0024911

General Storm Water Permit # NCG110000 COC # NCG110158

Air Quality (ABAQA) Title V Permit # 11-772-18

Collection System # WQCS00004

II. Description of Facilities

Collection System—System Services Division

In the fiscal year of 2025 (FY25), the Metropolitan Sewerage District provided wastewater service to over 60,000 customers with an estimated population of 277,210. This large service area spans the French Broad River and Swannanoa River Valleys covering about 264 square miles of land. Pipes conveying the wastewater from homes and businesses form an extensive collection system operated and maintained by our System Services Division. With over 1,157 miles of public sanitary sewer lines, 38 pump stations and approximately 34,700 manhole access points; significant manpower and equipment is required. Pipes vary in size from 66" diameter large interceptors down to 6" serving residential communities. Most of the piping within the District is between 50 and 100 years old and requires continual upkeep and/or replacement.

Water Reclamation Facility (WRF)

The Water Reclamation Facility (WRF) is rated at 40 million gallons per day (MGD) capacity serving most of Buncombe County (Asheville, Biltmore Forest, Black Mountain, Montreat, Weaverville, Woodfin and part of northern Henderson County). In FY25 an average flow of 21.3 million gallons per day were treated with the majority coming from residences. For the year, 7.7 billion gallons were treated with approximately 27 percent coming from Infiltration & Inflow (I&I). That's the industry term for groundwater seeping in from cracks in pipes and manholes or rainwater entering through manhole lids and unauthorized Storm Water connections. The District is continually working to reduce this number.

The design of our wastewater treatment system is called "attached growth" relying heavily on 152 rotating biological contactors (RBC's) to do the bulk of treatment. These RBC's provide over 400 acres (about 2.5 acres per unit) of surface area for microorganisms to grow upon. As the backbone of treatment, these microorganisms do the heavy lifting providing the return of clean, safe water back to the French Broad River; our receiving stream. MSD's facility is believed to be the largest RBC plant in the United States.

II. Description of Facilities — WRF Treatment Components

Preliminary Treatment Components

- Influent Multi-rake Barscreens (2 units, ½ inch Bar Spacing, 40 MGD each) with screenings washer/compactor and shaftless screw conveyer
- Influent Pumps (3 units) - 35 MGD rated capacity each
- Perforated Plate Fine Screens (3 units, ¼ inch openings, 40 MGD each) with screenings washer/compactor
- Vortex Grit Removal (2 units rated at 50 MGD) - Removal Rate 95% of Grit > 140 Mesh
- Storm Surge System - Utilizes three pumps rated at 5MGD each and two storm surge tanks rated at 2.1 million-gallons each

Primary Treatment Components

- Primary Clarification - Chemically Enhanced Kruger ACTIFLO system (Construction substantially complete in December of 2021)

Secondary Treatment Components

- 1st Stage RBC's (44 units)
- 2nd Stage RBC's (72 units)
- 3rd Stage RBC's (36 units)
- Intermediate Pumps (3 units) - pump water to clarifier from 3rd RBC stage
- Intermediate Clarifier (4 cells - total volume 2 MG)
- Microfiltration via AASI AquaDisk Units (16 units)

Disinfection Components

- Sodium Hypochlorite solution - average feed 1000 gallons/day at 6.5% solution strength

Residuals Handling Components

- Gravity Thickeners (2 units) - 100 foot-diameter each
- 2.5 Meter Belt Presses (2 units)
- Fluidized Bed Incinerator (3,317 dry pounds per hour)

Energy Management Components

- Two separate power circuits from Duke Energy for plant, with Automatic Transfer Switch if one fails
- 4-Megawatt total from three Diesel Generators (emergency backup power for WRF; will maintain full treatment processes during a power outage)
- 850 Kilowatt Hydro Turbines (3 units) - induction units (French Broad River source). These generate power using the District's dam/flume. The power is sold back to Duke Energy.

Automation Components

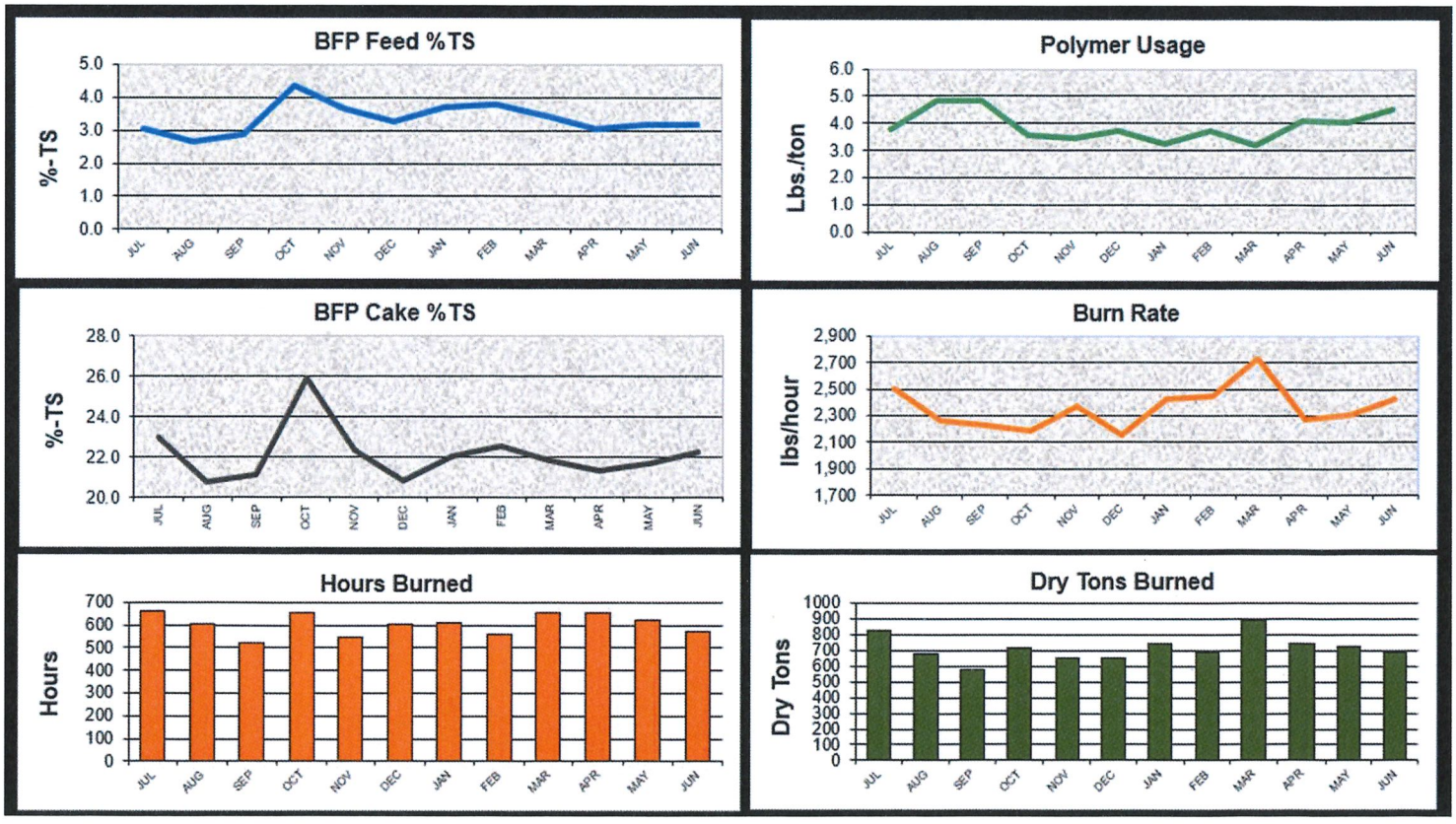
- SCADA (Supervisory Control and Data Acquisition) - full automated control of WRF

MSD utilizes its Fluidized Bed Incinerator as its primary residual management option. Presently the facility is managing 17-20 dry tons per day of residuals. The facilities are designed for 3,317 dry pounds per hour. Due to the lack of true primary clarifiers, most of the sludge generated at the facility is secondary in nature (i.e. sloughings from the RBC's).

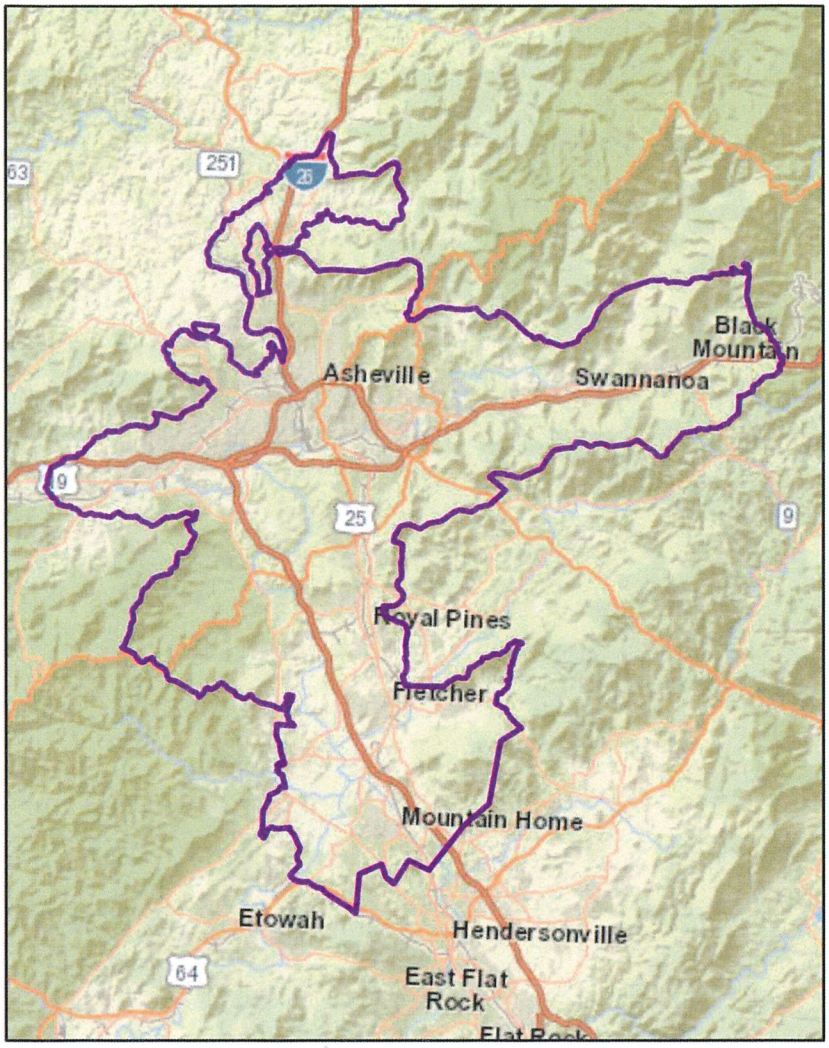
Sludge is thickened in on-site gravity thickeners to a consistency of 2-5% solids at which time it is then pumped to the 2 1/2-meter belt presses. These units dewater the sludge to over 22% solids and then it is pumped to the incinerator. Air emissions from the incinerator are of excellent quality, and air quality is further enhanced by a new filtration system added in 2016. Incinerator ash is thickened on-site via a gravity ash thickener and then pumped to an on-site lagoon. Ground-water is monitored in accordance with NCDEQ requirements (up & down gradient).

The incinerator system provides the most cost-effective method for sludge management. Supplementary fuel is sometimes required due to the 22% solids content - natural gas via Dominion Energy is utilized for this purpose.

MSD also maintains an agreement with the local county landfill (lined) to dispose of dewatered sludge during emergency and/or maintenance activities. This provides a second residuals management alternative, when or if needed.



Collection System Improvements



MSD assumed ownership and maintenance of the various local public collection systems in 1990, and since that time MSD has undertaken an aggressive program to correct existing known collection system problems. Between 1990 and 2024, over 1,436,697 linear feet (or 272 miles) of pipe have been replaced and over $548 million has been re-invested in plant and collection system rehabilitation projects. However, due to the large size of the MSD system, there is much work still to be done. From FY 2026 to FY 2035, the District expects to rehabilitate or replace an additional 407,104 linear feet.

Approximately $771.1 million will be spent for the District's Capital Improvement Program (CIP) over the next ten years. Of this, 6% will be spent on rehabilitating medium to large Interceptors, 26% on rehabilitating or replacing small collection lines, and 67% on the treatment plant and pump station projects.

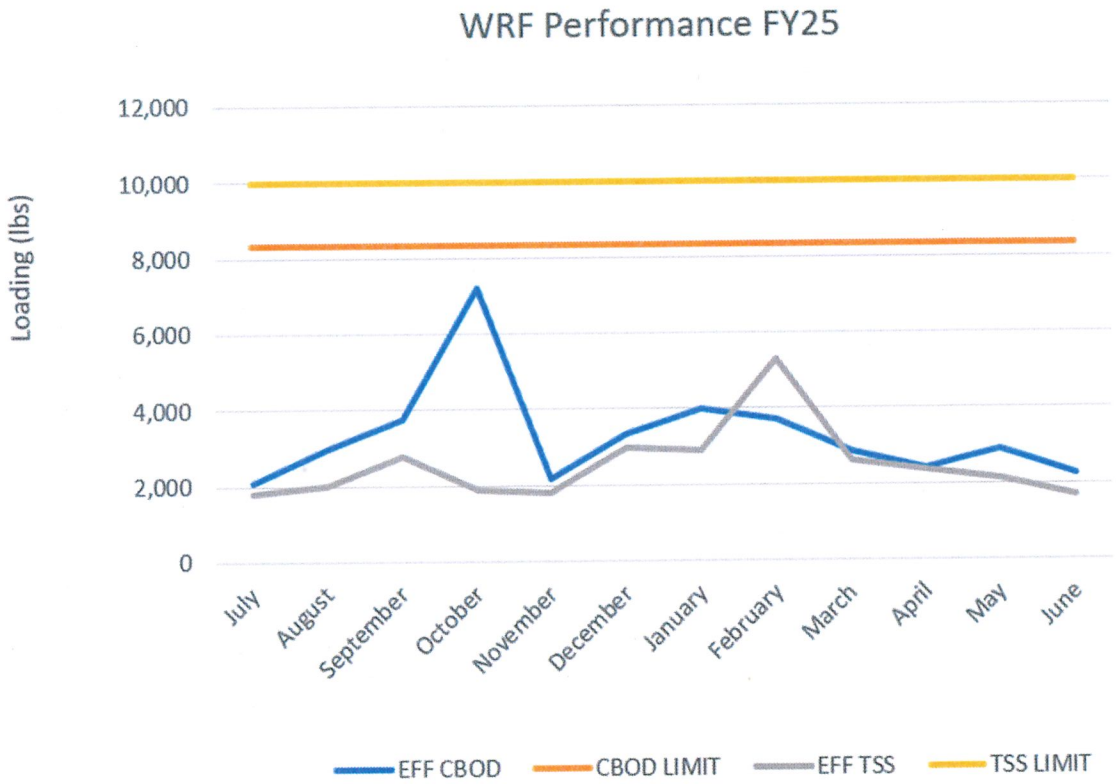
MSD's Pipe Rating Program is used to objectively prioritize rehabilitation projects throughout the regional collection system. This published, award winning program utilizes the District's Geographic Information System (GIS) and database software to collect rating data for each project. The data include Sanitary Sewer Overflow (SSO) history, customer service requests, proximity to streams/waterways, structural condition, and monitoring/maintenance schedules by MSD staff. A priority rating is then generated for each project, which is used to prioritize the ten -year CIP.

MSD maintains an aggressive Preventative Maintenance Program whereby approximately 901,150 lineal feet (or about 170 miles) of sewer lines were cleaned by high pressure water jetting equipment. In addition, over 40,970 linear feet of sewer lines are mechanically treated to remove tree roots and blockages. MSD also maintains its Rights-of-Way to ensure access to the system for cleaning and maintenance activities. During FY 2025 over 90,000 ft. were cleared.

Water Reclamation Facility (WRF) Performance Measures

During the FY25 annual reporting period, high performance measures were again achieved. The WRF continues to provide effective/efficient treatment services to the community averaging wastewater CBOD & TSS removal efficiencies of 91% and 94% respectively (state permit requires a minimum of 85% removal rates for compliance). The volume of flow to the WRF continues to remain well below hydraulic capacity for the plant averaging 21.3 million gallons per day.

MSD maintains a service contract agreement with Pace Analytical, Inc. (NC certified lab). This progressive opportunity continues to yield significant long-term savings to MSD. Also, the WRF successfully participated in surveillance audits regarding ISO14001 certification , coming through with zero (0) non-conformances. This program, also referred to as an Environmental Management System, continues to provide significant benefits to MSD both in the short & long-term.



Water Reclamation Facility Improvements

Several projects were completed in the past year:

- Clarifier Rehabilitation
  - ⇒ The rectangular clarifier, used to remove solids from the flow prior to filtration, had many areas of metal fatigue and deterioration. A project was developed to replace the damaged components in 4 stages. Stage 1 is now complete.

- Disabled RBC Removal & Replacement
  - ⇒ A number of RBCs were disabled due to broken shafts. A project was undertaken to replace the broken RBCs in basins 1&2 with RBCs from basin 3. The first half of this project is now complete.

- Clarifier MCC Replacement
  - ⇒ The motor control center (MCC) for both the clarifier building and the RAS building were old enough that new parts were not readily available. It was determined that a new MCC could be outfitted and that both locations could be combined into the new cabinets. This project gave us a more reliable electrical solution with easily sourced replacement parts.

CONSTRUCTION TOTALS BY DATE COMPLETED - Monthly

From 7/1/2024 to 6/30/2025

	Dig Ups	Emergency Dig Ups	Dig Up ML Ftg	Dig Up SL Ftg	Manhole Repairs	Taps Installed	Creek Crossings Cleared	ROW Ftg	Service Line Bore Ftg	Service Line Burst Ftg
July 2024	15	9	49	484	19	19	1	1,000	0	160
August 2024	22	10	36	641	25	20	0	35,099	0	0
September 2024	19	10	58	459	21	15	0	5,120	0	0
October 2024	46	11	440	780	99	8	18	1,730	0	0
November 2024	27	5	102	506	34	17	0	1,591	0	0
December 2024	50	9	78	610	14	15	0	8,060	0	0
January 2025	31	25	172	554	13	15	2	500	0	0
February 2025	33	29	181	974	21	18	2	0	0	25
March 2025	54	19	277	824	32	24	6	6,762	0	0
April 2025	50	11	205	829	24	22	0	0	0	40
May 2025	27	14	120	708	15	28	1	30,139	4	39
June 2025	22	5	95	676	15	30	1	20	0	0
Grand Total	**396**	**157**	**1,812**	**8,045**	**332**	**231**	**31**	**90,021**	**4**	**264**

CONSTRUCTION REHAB TOTALS BY DATE COMPLETED - Monthly

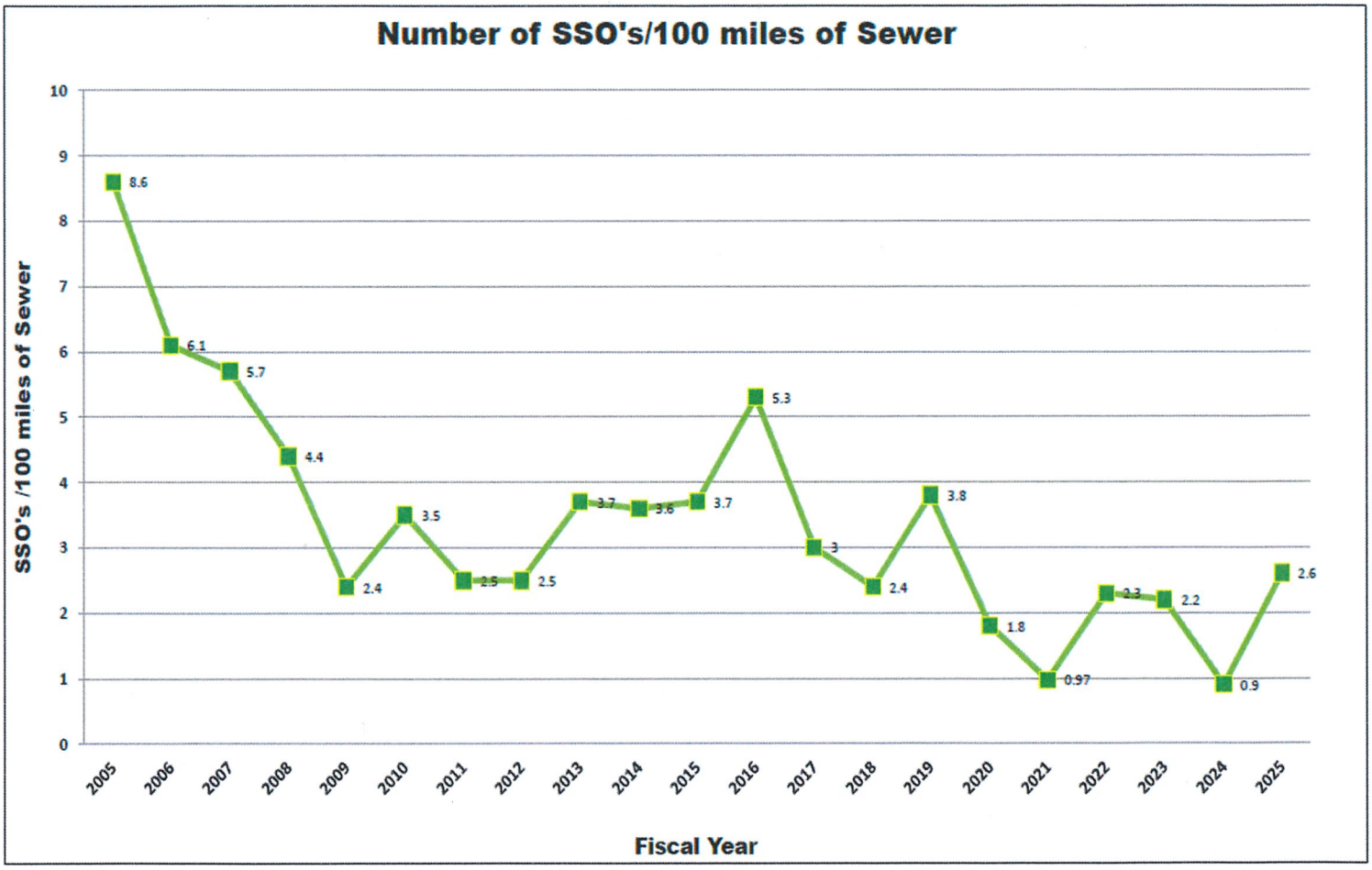
From 7/1/2024 to 6/30/2025

	# IRS Repairs	IRS Ftg	IRS Accept Ftg	Const Ftg	Const Accept Ftg	# D-R	D-R Ftg	#MH	Mainline PB Ftg	Mainline Bore Ftg	Total Rehab Ftg
July 2024	0	0	0	251	251	2	850	4	0	0	1101
August 2024	0	0	0	0	0	2	765	2	0	0	765
September 2024	2	184	180	437	437	1	355	3	0	0	972
October 2024	0	0	0	860	1058	2	834	0	0	0	1892
November 2024	0	0	0	1815	1815	0	8	3	0	0	1823
December 2024	0	0	0	0	0	0	0	0	0	0	0
January 2025	0	0	0	282	282	0	0	0	0	0	282
February 2025	0	0	0	471	471	1	8	2	0	0	479
March 2025	0	0	0	241	241	2	1135	10	0	0	1376
April 2025	0	0	0	263	263	1	470	1	0	0	733
May 2025	0	0	0	197	197	3	795	7	0	0	992
June 2025	0	0	0	52	52	3	890	10	187	0	1129
Grand Totals	**2**	**184**	**180**	**4869**	**5067**	**17**	**6110**	**42**	**187**	**0**	**11544**

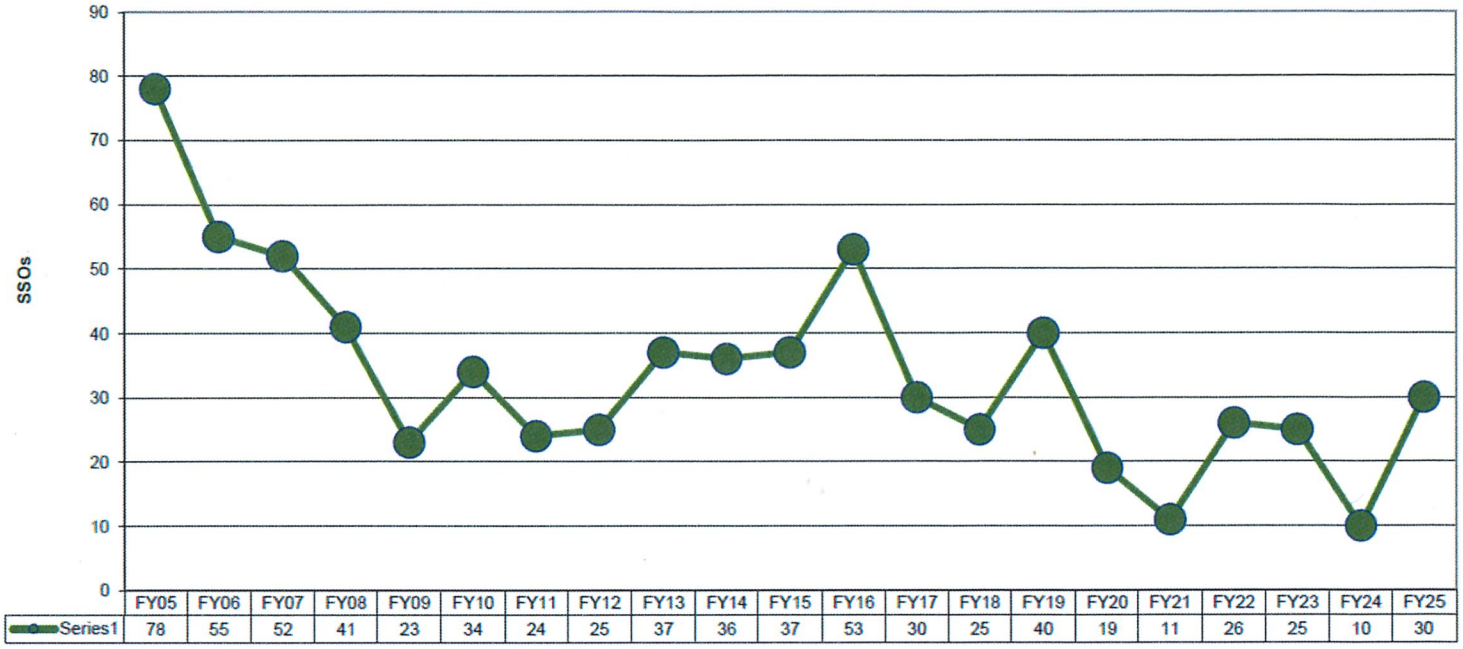
Collection System, System Services Division Performance Measures

System Services division completed and submitted to NCDEQ-DWR two six-month High Priority Line Inspection Reports. The High Priority Line report documents inspection of aerial lines, siphons and lines in proximity to vulnerable creeks and streams.

The collection system recorded 30 sanitary sewer overflows (SSO's) which equates to 2.6 SSO's per 100 miles of sewer. All SSO's were remediated according to the District's standard operating procedures for sanitary sewer overflow cleanup and no severe environmental impact occurred.



Sanitary Sewer Overflows



SSO Report - Monthly

From 7/1/2024 to 6/30/2025

	SSO Count	AVG Response Time (min.)	AVG SSO Volume (gal.)	AVG Surface Volume (gal.)	Spills >= 1000 Gallons	Spills >= 15,000 Gallons	Total SSO Volume (gal.)	Total Surface Volume (gal.)
July, 2024	0	0	0	0	0	0	0	0
August, 2024	0	0	0	0	0	0	0	0
September, 2024	2	22	2,200	2,200	1	0	4,400	4,400
October, 2024	1	32	39	39	0	0	39	39
November, 2024	2	15	259	262	0	0	518	523
December, 2024	3	38	854	687	1	0	2,562	2,062
January, 2025	4	15	423	416	0	0	1,693	1,662
February, 2025	7	33	719	709	1	0	5,033	4,960
March, 2025	7	21	312	312	1	0	2,184	2,184
April, 2025	3	11	450	234	0	0	1,349	702
May, 2025	1	20	500	500	0	0	500	500
June, 2025	0	0	0	0	0	0	0	0
Grand Totals:	**30**	**24**	**609**	**568**	**4**	**0**	**18,278**	**17,032**

CUSTOMER SERVICE REQUESTS
Monthly - All Crews

CREW	MONTH	JOBS	AVERAGE REPSONSE TIME	AVERAGE TIME SPENT
DAY 1ST RESPONDER				
	July, 2024	95	28	36
	August, 2024	104	25	33
	September, 2024	83	24	29
	October, 2024	203	36	28
	November, 2024	147	28	31
	December, 2024	143	26	31
	January, 2025	156	31	34
	February, 2025	179	30	34
	March, 2025	162	25	36
	April, 2025	131	26	34
	May, 2025	116	27	39
	June, 2025	143	29	37
		1,662	**28**	**34**
NIGHT 1ST RESPONDER				
	July, 2024	35	28	21
	August, 2024	39	23	22
	September, 2024	34	25	20
	October, 2024	26	36	22
	November, 2024	45	37	33
	December, 2024	47	35	38
	January, 2025	56	35	21
	February, 2025	64	37	28
	March, 2025	54	30	21
	April, 2025	62	30	27
	May, 2025	49	33	32
	June, 2025	46	40	25
		557	**33**	**26**
ON-CALL CREW *				
	July, 2024	28	37	36
	August, 2024	33	78	57

* On-Call Crew Hours: 8:00pm-7:30am (Jul. - Oct.) 11:30pm-7:30am (from Nov. onward) Monday-Friday, Weekends, and Holidays

8/6/2025

CUSTOMER SERVICE REQUESTS
Monthly - All Crews

CREW	MONTH	JOBS	AVERAGE REPSONSE TIME	AVERAGE TIME SPENT
ON-CALL CREW *				
	September, 2024	26	45	78
	October, 2024	84	49	32
	November, 2024	76	69	29
	December, 2024	70	49	30
	January, 2025	60	69	32
	February, 2025	48	49	39
	March, 2025	32	54	42
	April, 2025	21	57	45
	May, 2025	31	55	56
	June, 2025	37	56	54
		546	**56**	**40**
Grand Totals:		**2,765**	**35**	**33**

* On-Call Crew Hours: 8:00pm-7:30am (Jul. - Oct.) 11:30pm-7:30am (from Nov. onward) Monday-Friday, Weekends, and Holidays

IV. Performance Measures

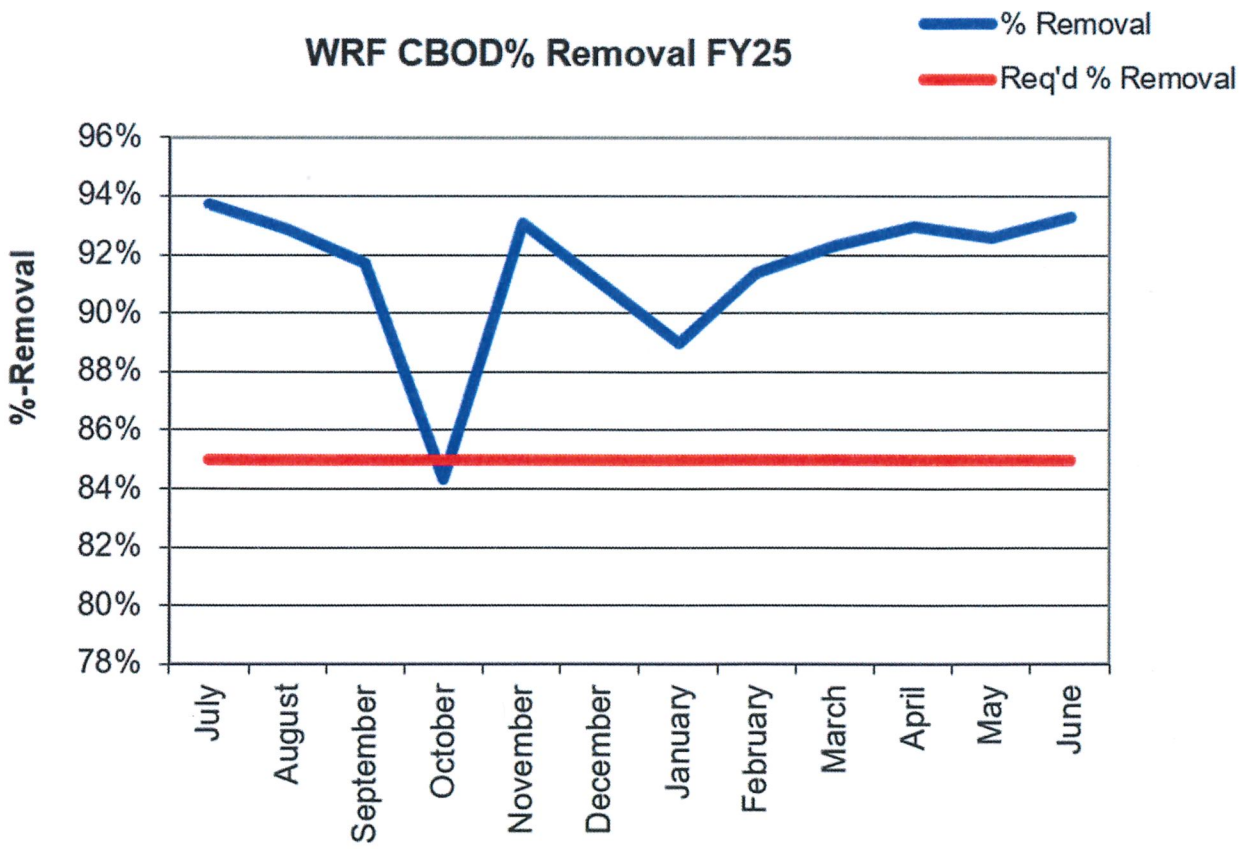
PIPELINE MAINTENANCE TOTALS BY DATE COMPLETED - Monthly

July 01, 2024 to June 30, 2025

	Main Line Wash Footage	Service Line Wash Footage	Rod Line Footage	Cleaned Footage	CCTV Footage	Smoke Footage	SL-RAT Footage
2024							
July	116,397	2,129	1,130	117,527	27,291	400	16,384
August	127,530	1,793	1,872	129,402	26,635	1,946	38,251
September	71,201	1,397	2,001	73,202	16,992	0	16,437
October	51,422	2,735	793	52,215	7,684	0	0
November	44,121	2,096	1,029	45,150	7,203	50	4,596
December	49,860	2,517	1,742	51,602	5,998	0	9,136
2025							
January	63,215	2,553	3,425	66,640	9,581	0	4,716
February	77,944	2,855	6,980	84,924	25,313	0	14,798
March	68,554	2,814	10,155	78,709	22,323	0	18,411
April	80,658	2,341	4,363	85,021	28,576	0	13,942
May	59,783	2,071	4,532	64,315	19,570	0	11,148
June	90,478	2,510	2,952	93,430	11,150	1,000	0
Grand Total:	**901,163**	**27,810**	**40,974**	**942,137**	**208,316**	**3,396**	**147,819**
Avg Per Month:	**75,097**	**2,317**	**3,414**	**78,511**	**17,360**	**283**	**12,318**

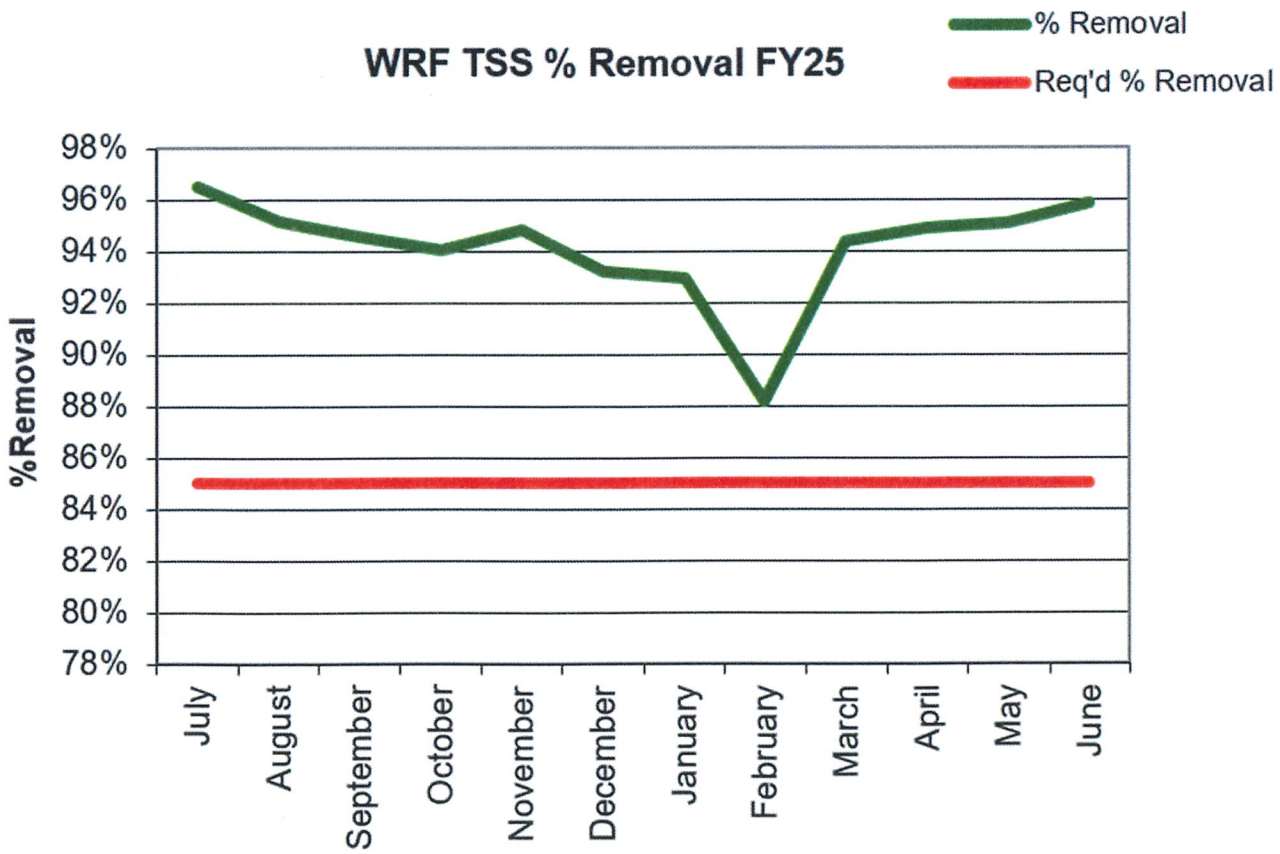
Water Reclamation Facility (WRF) Performance Measures

Month	INF CBOD	EFF CBOD	% Removal	Req'd % Removal
July	190.3	12.0	94%	85%
August	256.8	18.3	93%	85%
September	226.4	18.8	92%	85%
October	320.4	50.3	84%	85%
November	200.8	14.0	93%	85%
December	208.0	18.6	91%	85%
January	220.8	24.4	89%	85%
February	215.8	18.7	91%	85%
March	229.2	17.6	92%	85%
April	193.7	13.6	93%	85%
May	209.1	15.5	93%	85%
June	200.8	13.5	93%	85%
Average	222.7	19.6		
% Removal		91%		



Water Reclamation Facility (WRF) Performance Measures

Month	INF TSS	EFF TSS	% Removal	Req'd % Removal
July	297.9	10.4	97%	85%
August	251.4	12.2	95%	85%
September	256.4	14.0	95%	85%
October	220.5	13.1	94%	85%
November	224.4	11.7	95%	85%
December	242.4	16.5	93%	85%
January	250.6	17.7	93%	85%
February	224.5	26.5	88%	85%
March	284.0	16.0	94%	85%
April	257.5	13.2	95%	85%
May	232.2	11.4	95%	85%
June	239.9	9.9	96%	85%
Average	248.5	14.4		
% Removal		94%		



Hydroelectric Performance Measures

MSD operates a hydroelectric facility with three (3) horizontal turbines that produce electrical power. This energy is then sold back to the electrical grid to Duke Energy. These turbines benefit MSD because it offsets the cost of energy used to operate the WRF. The treatment of wastewater is an energy hungry process, but the hydroelectric facility allows MSD to save $300,000 to $600,000 in energy costs per year. The variation in savings is dependent on rainfall and maintenance requirements that occur during the year.

Task	FY23	FY24	FY25
Daily (average) Flow, treated MGD	20.88	20.12	21.3
Maximum daily flow treated, MGD	60.00	71.70	76.77
Dry tons of bio-solids processed	5,419	7,524	8,581
Cost per million gallons (MG), treated	$730	$793	$808
Energy cost per MG. treated	$139	$141	$177
Carbonaceous biochemical oxygen demand (CBOD) removal, %	93%	92%	91%
Total suspended solids (TSS) removal efficiency, %	95%	95%	94%
Number of NPDES permit non-compliance	0	2	0
Preventative to corrective maintenance ratio	70:30	70:30	70:30

V. Certification

I certify under penalty of law that this report is complete and accurate to the best of my knowledge. I further certify that this report has been made available to the users and customers of the MSD system and that those users have been notified of its availability.

Thomas E. Hartye, P.E.
General Manager
Metropolitan Sewerage District of Buncombe County, NC

August 20, 2025

If you would like more information please email webmaster@msdbc.org