



# MSD

Metropolitan Sewerage District  
of Buncombe County, North Carolina

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Asheville, NC 28804  
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M. Jerry VeHaun, Chairman  
E. Glenn Kelly, Vice Chairman  
Jackie W. Bryson, Sec./Treasurer  
Esther Manheimer  
Chris Pelly  
Gwen Wisler  
Robert Pressley  
Nathan Pennington  
Al Whitesides  
Robert C. Watts  
Matt Ashley, Jr.  
Earl Valois

Thomas E. Hartye, General Manager  
William Clarke, General Counsel

August 31<sup>st</sup>, 2020

System Performance Annual Report  
North Carolina Division of Water Quality  
1617 Mail Service Center  
Raleigh, NC 27699-1617

Dear Sirs,

Please find the three (3) enclosed copies of the System Performance Annual Report for the Metropolitan Sewerage District of Buncombe County, as required in the General Statute 143-215.1C. Public notification was published subsequent to the mailing of this letter on August 30<sup>st</sup>, 2020 in the Asheville Citizen-Times. Reference was made in the article to the viewing of the report on our website, [www.msdbc.org](http://www.msdbc.org), written request to the MSD, or by request by phone for a printed copy. An abbreviated report is also available to our customers. Please feel free to call me if you need any additional information.

Respectfully,

Metropolitan Sewerage District of Buncombe County, NC

A handwritten signature in black ink, appearing to read "Thomas E. Hartye".

Thomas E. Hartye, P.E.  
General Manager MSD

CC: Ms. Linda Wiggs

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**System Performance Annual Report**  
**Fiscal Year 2020 (July '19 thru June '20)**

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**I. General Information**

Metropolitan Sewerage District of Buncombe County, NC  
2028 Riverside Drive, William H. Mull Building  
Asheville, North Carolina 28804

General Manager	Thomas E. Hartye, P.E.	(828) 254-9646
Director of Wastewater Reclamation Facility (WRF)	Roger Edwards (ORC)	(828) 225-8224
Operations Manager (WRF)	Dwayne Martin (ORC-Backup)	(828) 225-8204
Director of Technical Services (Collection System)	Ken Stines (ORC)	(828) 225-8244
Director of Construction (Collection System)	Mike Stamey, P.E. (ORC-Backup)	(828) 225-8262

**Permit Numbers:**

- NPDES Permit # NC0024911
- General Storm Water Permit # NCG110000 COC # NCG110158
- Air Quality (WNCRAPCA) Title V Permit # 11-772-18
- Collection System # WQCS00004

**II. Description of Facilities**

**A. Collection System- System Services Division**

In the fiscal year of 2020 (FY20), the Metropolitan Sewerage District provided wastewater service to over 56,000 customers with an estimated population of 172,932. This large service area spans the French Broad River and Swannanoa River Valleys covering about 215 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 1,041 miles of public sanitary sewer lines, 31 pump stations and approximately 30,988 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.

**B. 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 FY20 an average flow of 23.4 million gallons per day were treated with the majority coming from residences. For the year, 8.5 billion gallons were treated with more than one-third 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 has been aggressively working to abate this problem.

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 world. A detailed listing of our treatment system components is as follows;

#### **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 (Under Construction as of March 2019. Completion expected by Spring 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 (2,561 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

### **Sludge Management Plan**

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 2,651 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. Recent air emissions testing place removal efficiency of the air scrubbers at 99+% for regulated parameters, 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. Groundwater 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 (formerly PSNC 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.

## **III. Improvements to Facilities**

### **A. 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 2020, over 1,289,682 linear feet (or 239 miles) of pipe have been replaced and over \$418 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 2021 to FY 2030, the District expects to rehabilitate or replace an additional 409,472 linear feet.

Approximately \$332 million will be spent for the District's Capital Improvement Program (CIP) over the next ten years. Of this, 26% will be spent on rehabilitating medium to large interceptors, 38% on rehabilitating or replacing small collection lines, and 35% on the treatment plant and pump station projects. The total estimated cost to rehabilitate the District's aged collection system and WRF facilities over the next twenty-year period is estimated at over \$460 million.

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 SSO & overflow 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 905,800 lineal feet (or about 172 miles) of sewer lines were cleaned by high pressure water jetting equipment. In addition, over 53,250 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 2020 over 49,990 ft. were cleared.

### **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 19 sanitary sewer overflows (SSO's) which equates to 1.8 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.

#### **Attachments**

**(These documents are in Adobe Acrobat format.)**

- [Customer Service response times](#)
- [Pipeline Maintenance totals](#)
- [SSO Report - monthly](#)
- [Construction totals \(In System Services Division\)](#)
- [SSO's per 100 miles of sewer chart for FY19](#)
- [Performance measures SSO chart](#)

### **B. Water Reclamation Facility Improvements**

Facility projects that are underway at the WRF include the following;

- High Rate Primary Treatment Project: This project is recommended by the Water Reclamation Facility Plan. This \$17.0 million project will provide high-rate primary clarification and will help the plant's Rotating Biological Contactor system perform at a higher level and be better equipped to meet future regulations. Construction is currently underway, and completion is expected by Spring 2021.

### **Water Reclamation Facility (WRF) Performance Measures**

During the FY20 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 93% 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 23.4 million gallons per day. The WRF remains in compliance for all permitted parameters and receives favorable reviews by NC Department of Environmental Quality and the WNC Regional Air Quality Agency.

MSD maintains a service contract agreement with Pace Analytical, Inc. (NC certified lab). This agreement incorporates the exchange of full laboratory testing services for use of the existing laboratory space. 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.

### **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	FY18	FY19	FY20
1. Daily (average) flow, treated MGD	20.8	25.9	23.4
2. Maximum daily flow treated, MGD	64.8	67.5	67.2
3. Dry tons of bio-solids processed	7,280	7,212	7,886
4. Cost per million gallons (MG), treated	\$718	\$554	\$729
5. Energy costs per MG, treated	\$121	\$107	\$111
6. Carbonaceous biochemical oxygen demand (CBOD) removal, %	95%	92%	93%
7. Total suspended solids (TSS) removal efficiency, %	97%	95%	94%
8. Number of NPDES permit non-compliance	1	3	1
9. Preventative to corrective maintenance ratio	70:30	70:30	70:30

**Attachments**

**(These documents are in Adobe Acrobat format.)**

- Plant location map with contours ( This is a large file)
- Schematic of Wastewater Reclamation Facility
- Water Reclamation Facility site
- WRF performance chart
- WRF pollutant removals
- Biosolids production
- Air emissions
- Hydroelectric Performance

**IV. 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.




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

August 31, 2020

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If you would like a hard copy or more information...  
 Write to [webmaster@msdbc.org](mailto:webmaster@msdbc.org)



## CUSTOMER SERVICE REQUESTS Monthly - All Crews

CREW	MONTH	JOB	AVERAGE RESPONSE TIME	AVERAGE TIME SPENT
<b>DAY 1ST RESPONDER</b>				
	July, 2019	108	25	35
	August, 2019	85	23	41
	September, 2019	59	24	38
	October, 2019	94	24	40
	November, 2019	80	26	35
	December, 2019	96	27	36
	January, 2020	90	23	43
	February, 2020	103	24	34
	March, 2020	119	28	35
	April, 2020	138	36	23
	May, 2020	95	29	32
	June, 2020	126	27	38
		<b>1,193</b>	<b>27</b>	<b>35</b>
<b>NIGHT 1ST RESPONDER</b>				
	July, 2019	13	24	15
	August, 2019	18	25	20
	September, 2019	7	30	36
	October, 2019	13	28	23
	November, 2019	28	21	22
	December, 2019	42	30	30
	January, 2020	40	33	32
	February, 2020	30	24	37
	March, 2020	36	38	30
	April, 2020	38	35	25
	May, 2020	40	27	26
	June, 2020	60	26	23
		<b>365</b>	<b>29</b>	<b>27</b>
<b>ON-CALL CREW *</b>				
	July, 2019	41	41	37
	August, 2019	29	34	30

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



## CUSTOMER SERVICE REQUESTS Monthly - All Crews

CREW	MONTH	JOB	AVERAGE RESPONSE TIME	AVERAGE TIME SPENT
<b>ON-CALL CREW *</b>				
	September, 2019	24	39	59
	October, 2019	38	34	25
	November, 2019	32	41	56
	December, 2019	56	50	31
	January, 2020	36	49	46
	February, 2020	31	37	38
	March, 2020	50	57	26
	April, 2020	32	50	28
	May, 2020	34	48	37
	June, 2020	17	46	49
		420	45	37
<b>Grand Totals:</b>		1,978	31	34

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



# SSO Report - Monthly

From 7/1/2019 to 6/30/2020

	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, 2019	1	29	630	300	0	0	630	300
August, 2019	2	16	365	300	0	0	730	600
September, 2019	3	15	418	418	0	0	1,255	1,255
October, 2019	1	13	7,944	7,944	1	0	7,944	7,944
November, 2019	0	0	0	0	0	0	0	0
December, 2019	0	0	0	0	0	0	0	0
January, 2020	2	19	1,008	950	1	0	2,016	1,900
February, 2020	5	34	3,148	3,015	2	0	15,738	15,075
March, 2020	1	1	250	200	0	0	250	200
April, 2020	1	45	500	350	0	0	500	350
May, 2020	2	34	498	300	0	0	995	600
June, 2020	1	0	600	600	0	0	600	600
<b>Grand Totals:</b>	<b>19</b>	<b>22</b>	<b>1,614</b>	<b>1,517</b>	<b>4</b>	<b>0</b>	<b>30,658</b>	<b>28,824</b>



## PIPELINE MAINTENANCE TOTALS BY DATE COMPLETED - Monthly

July 01, 2019 to June 30, 2020

	Main Line Wash Footage	Service Line Wash Footage	Rod Line Footage	Cleaned Footage	CCTV Footage	Smoke Footage	SL-RAT Footage
<b>2019</b>							
July	89,420	739	8,930	98,350	21,980	325	17,474
August	100,227	1,060	1,520	101,747	20,013	2,700	6,860
September	62,575	696	3,060	65,635	13,188	14,821	44,100
October	88,177	972	5,789	93,966	41,345	500	49,697
November	64,927	1,519	5,862	70,789	11,418	0	23,503
December	61,961	2,873	5,695	67,656	18,165	0	28,567
<b>2020</b>							
January	90,722	2,276	3,951	94,673	10,357	200	21,239
February	71,292	1,360	6,097	77,389	17,672	1,050	19,284
March	101,294	2,110	4,976	106,270	8,396	0	17,568
April	10,562	1,417	720	11,282	2,108	0	0
May	68,390	1,693	4,110	72,500	11,970	3,100	19,986
June	96,231	1,931	2,542	98,773	19,134	1,000	17,447
<b>Grand Total:</b>	<b>905,778</b>	<b>18,646</b>	<b>53,252</b>	<b>959,030</b>	<b>195,746</b>	<b>23,696</b>	<b>265,725</b>
<b>Avg Per Month:</b>	<b>75,482</b>	<b>1,554</b>	<b>4,438</b>	<b>79,919</b>	<b>16,312</b>	<b>1,975</b>	<b>22,144</b>



# CONSTRUCTION TOTALS BY DATE COMPLETED - Monthly

From 7/1/2019 to 6/30/2020

	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 2019	25	12	163	718	27	24	2	12,239	0	0
August 2019	32	6	138	488	27	28	3	2,615	109	0
September 2019	13	10	286	431	18	21	1	11,200	22	0
October 2019	23	9	156	1,008	22	29	0	3,445	118	0
November 2019	15	8	60	396	25	15	0	1,250	0	0
December 2019	13	11	35	544	20	13	0	150	75	0
January 2020	28	15	68	746	15	29	2	5,092	0	0
February 2020	26	8	126	515	15	16	5	0	225	0
March 2020	36	13	102	1,075	7	38	1	0	100	0
April 2020	19	5	35	568	15	34	5	0	0	0
May 2020	29	8	68	581	9	21	0	0	0	0
June 2020	25	14	89	741	17	26	0	14,000	0	0
<b>Grand Total</b>	<b>284</b>	<b>119</b>	<b>1,325</b>	<b>7,811</b>	<b>217</b>	<b>294</b>	<b>19</b>	<b>49,991</b>	<b>649</b>	<b>0</b>

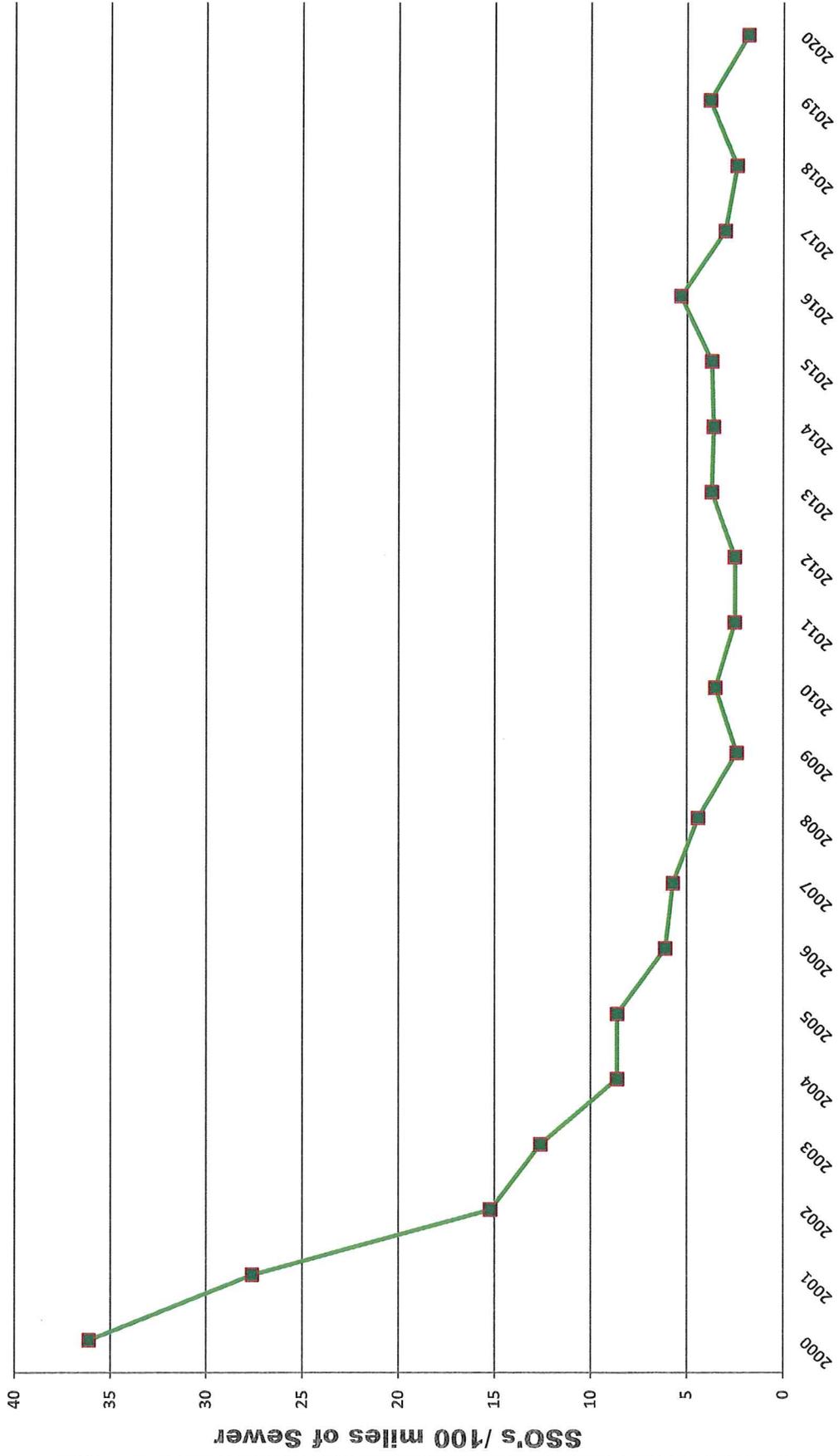


# CONSTRUCTION REHAB TOTALS BY DATE COMPLETED - Monthly

From 7/1/2019 to 6/30/2020

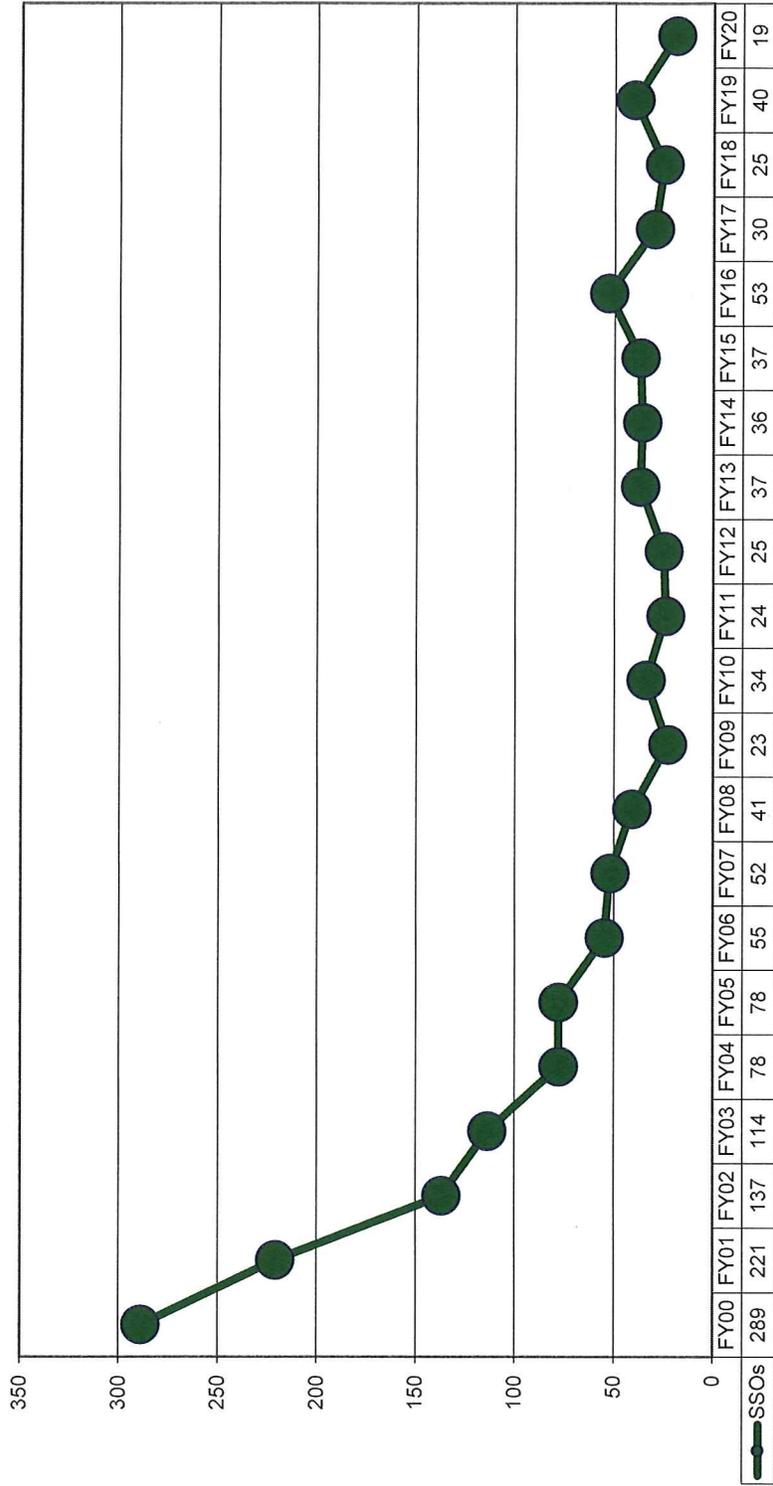
	# IRS Repairs	IRS Ftg	IRS Accept Ftg	Const Ftg	Const Accept Ftg	# D-R	D-R Ftg	#MH	Mainline PB Ftg	Mainline Bore Ftg	Total Rehab Ftg
July 2019	0	0	0	24	24	4	606	10	0	1121	1751
August 2019	0	0	0	30	110	6	1543	12	0	0	1653
September 2019	0	0	0	0	0	2	800	10	100	0	900
October 2019	0	0	0	0	0	2	236	8	0	420	656
November 2019	0	0	0	608	608	3	566	7	0	0	1174
December 2019	0	0	0	298	298	2	1237	6	0	0	1535
January 2020	0	0	0	660	1031	1	351	2	0	0	1382
February 2020	0	0	0	0	0	1	198	3	0	82	280
March 2020	0	0	0	528	528	2	1096	8	0	0	1624
April 2020	0	0	0	0	0	1	30	0	0	0	30
May 2020	0	0	0	0	0	1	72	1	0	0	72
June 2020	0	0	0	248	248	1	278	2	0	0	526
<b>Grand Totals</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2396</b>	<b>2847</b>	<b>26</b>	<b>7013</b>	<b>69</b>	<b>100</b>	<b>1623</b>	<b>11583</b>

# Number of SSO's/100 miles of Sewer



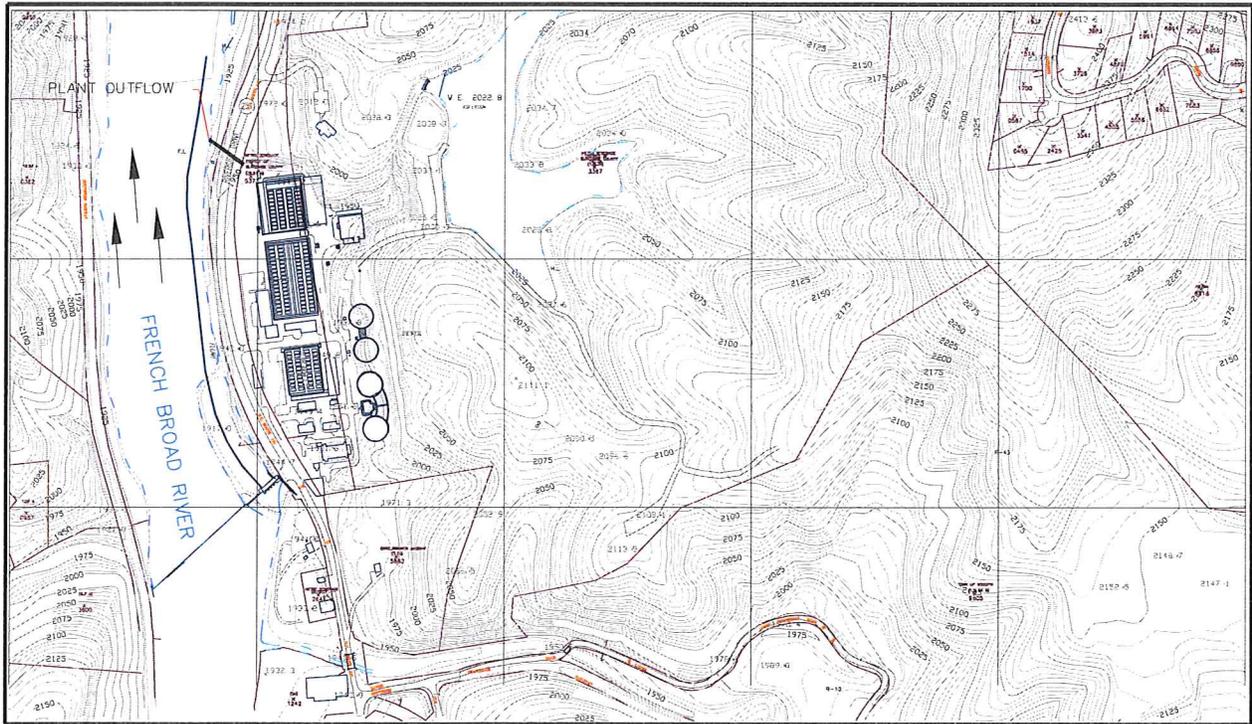
Fiscal Year

# Sanitary Sewer Overflows



SSOs

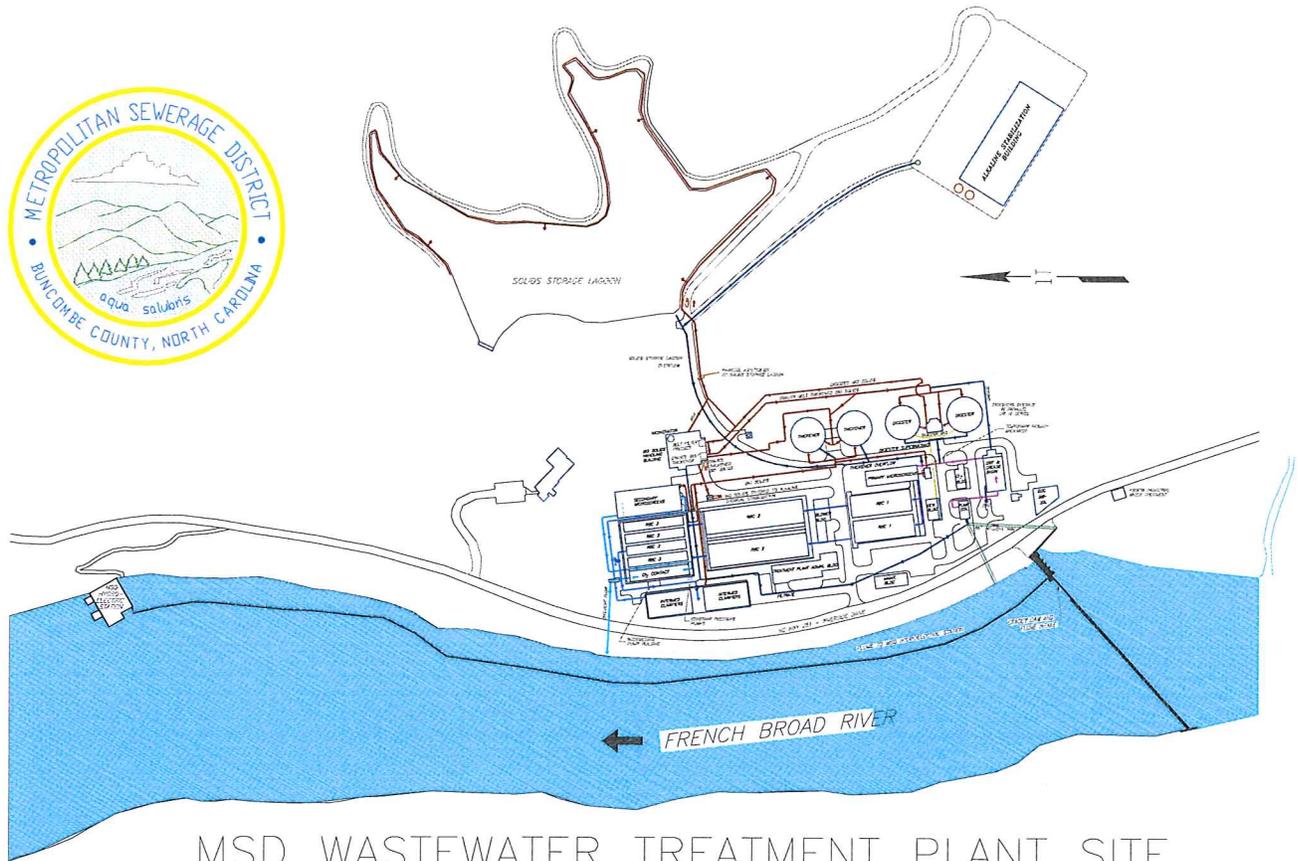
Fiscal Year



PLANT LOCATION  
NOT TO SCALE

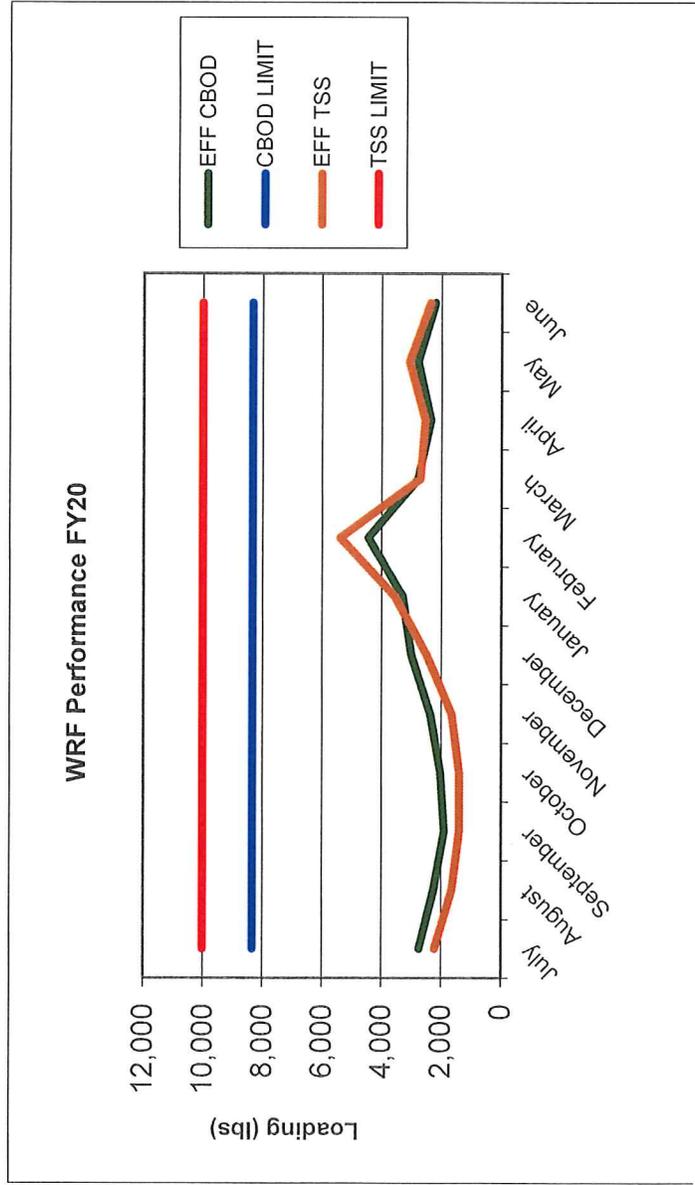






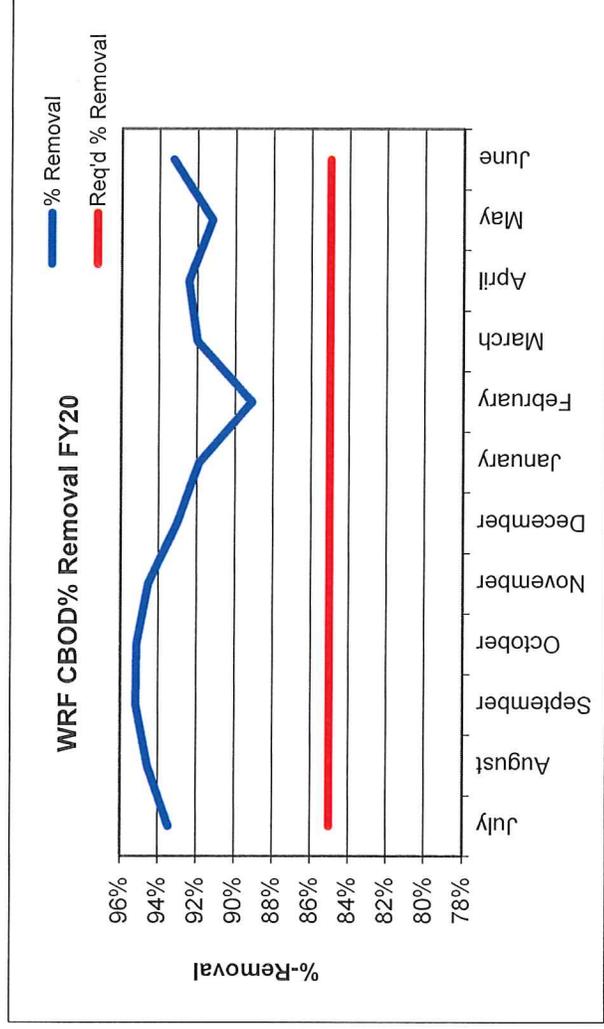
MSD WASTEWATER TREATMENT PLANT SITE  
NOT TO SCALE

Month	EFF CBOD	EFF CBOD	CBOD LIMIT	CBOD LIMIT	EFF TSS	EFF TSS	TSS LIMIT	TSS LIMIT	TSS LIMIT	Flow
July	14.0	2,740	25	8,340	11.3	2,215	30	10,008	10,008	23.5
August	12.7	2,247	25	8,340	9.2	1,633	30	10,008	10,008	21.3
September	12.0	1,900	25	8,340	8.8	1,389	30	10,008	10,008	19.0
October	11.6	2,026	25	8,340	8.0	1,394	30	10,008	10,008	20.9
November	13.6	2,372	25	8,340	9.4	1,642	30	10,008	10,008	20.9
December	14.8	3,007	25	8,340	12.2	2,488	30	10,008	10,008	24.4
January	15.8	3,292	25	8,340	17.0	3,555	30	10,008	10,008	25.1
February	17.4	4,448	25	8,340	21.1	5,397	30	10,008	10,008	30.7
March	13.5	2,783	25	8,340	13.1	2,713	30	10,008	10,008	24.8
April	11.3	2,355	25	8,340	12.3	2,546	30	10,008	10,008	24.9
May	12.9	2,782	25	8,340	14.3	3,079	30	10,008	10,008	25.9
June	12.5	2,203	25	8,340	13.4	2,369	30	10,008	10,008	21.2
<b>Average</b>	<b>13.5</b>	<b>2,680</b>	<b>25.0</b>	<b>8,340</b>	<b>12.5</b>	<b>2,535</b>	<b>30.0</b>	<b>10,008</b>	<b>10,008</b>	<b>23.5</b>
	Conc.	Lbs.	Conc.	Lbs.	Conc.	Lbs.	Conc.	Lbs.	Lbs.	MGD



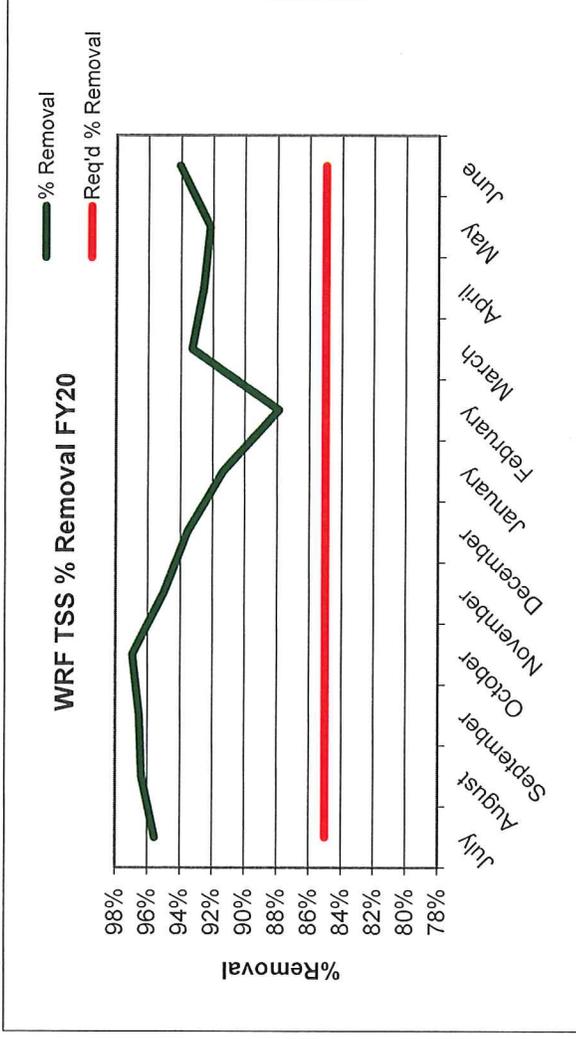
Month	INF CBOD	EFF CBOD	% Removal	Req'd % Removal	85%
July	213.7	14.0	93%	93%	85%
August	232.2	12.7	95%	95%	85%
September	247.9	12.0	95%	95%	85%
October	238.3	11.6	95%	95%	85%
November	248.6	13.6	95%	95%	85%
December	211.8	14.8	93%	93%	85%
January	194.2	15.8	92%	92%	85%
February	159.7	17.4	89%	89%	85%
March	168.4	13.5	92%	92%	85%
April	150.4	11.3	92%	92%	85%
May	146.9	12.9	91%	91%	85%
June	185.5	12.5	93%	93%	85%
<b>Average</b>	<b>199.8</b>	<b>13.5</b>	<b>93%</b>	<b>93%</b>	

**Average** 199.8 13.5  
**% Removal** 93%



Month	INF TSS	EFF TSS	% Removal	Req'd % Removal	85%
July	254.4	11.3	96%	96%	85%
August	252.0	9.2	96%	96%	85%
September	252.0	8.8	97%	97%	85%
October	262.2	8.0	97%	97%	85%
November	188.9	9.4	95%	95%	85%
December	189.7	12.2	94%	94%	85%
January	196.2	17.0	91%	91%	85%
February	174.5	21.1	88%	88%	85%
March	195.6	13.1	93%	93%	85%
April	165.2	12.3	93%	93%	85%
May	182.5	14.3	92%	92%	85%
June	226.6	13.4	94%	94%	85%
<b>Average</b>	<b>211.6</b>	<b>12.5</b>	<b>94%</b>	<b>94%</b>	

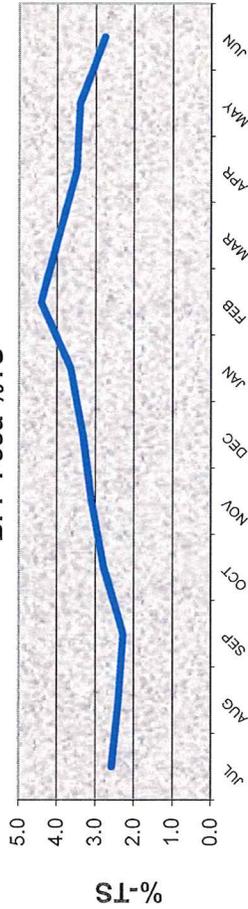
**Average** 211.6 12.5  
**% Removal** 94%



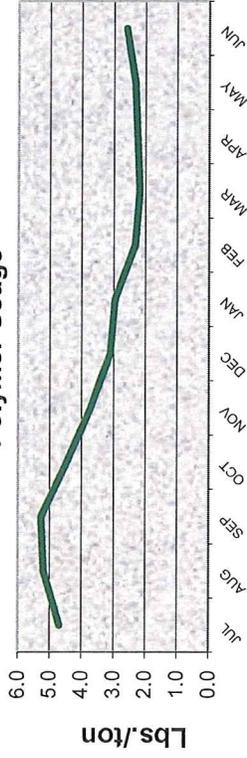
FY20 Biosolids Management

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	Yearly Totals	Average per month	Units	
Feed Solids	2.6	2.4	2.3	2.8	3.1	3.3	3.6	4.4	4.0	3.5	3.4	2.8			3.2	%-TS
Cake Solids	21.0	20.3	19.9	20.6	20.7	21.0	22.3	21.9	22.3	21.7	21.9	20.3			21.2	%-TS
Polymer - Lbs./ton	4.7	5.2	5.3	4.5	3.7	3.1	3.0	2.3	2.2	2.2	2.3	2.6			3.4	Lbs./Ton
Polymer - Total Lbs.	3,013	3,603	3,135	2,924	2,530	2,310	2,145	2,145	2,420	1,185	2,035	1,207	28,651		2,388	Lbs./Mth
Dry Tons Burned	642	615	561	569	541	580	409	151	622	529	544	466	6,228		519	Dry Tons
Hours Burned	680	684	649	646	603	625	457	153	656	557	575	520	6,805		567	Hours
Burn Rate - lbs/hr	1,889	1,798	1,728	1,763	1,793	1,856	1,790	1,974	1,895	1,899	1,893	1,792	1,839		1,839	lbs./hour
Natural Gas - MCF	3.40	3.55	3.51	3.21	3.00	2.90	2.00	1.19	2.40	2.78	2.73	2.81	33.48		2.79	MCF
Dry Tons - Landfill								1658					1,658			Dry Tons
Wet Tons - Scales								2073					2,073			Wet Tons

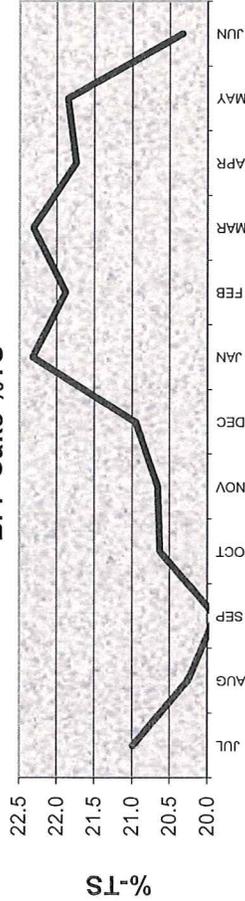
BFP Feed %TS



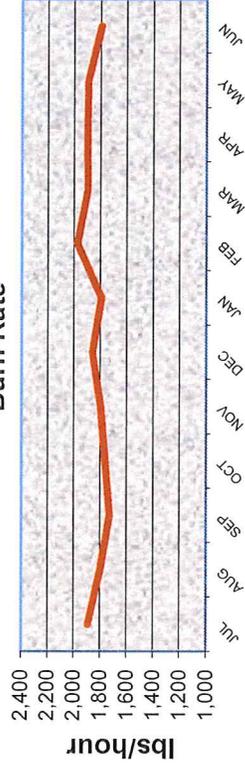
Polymer Usage



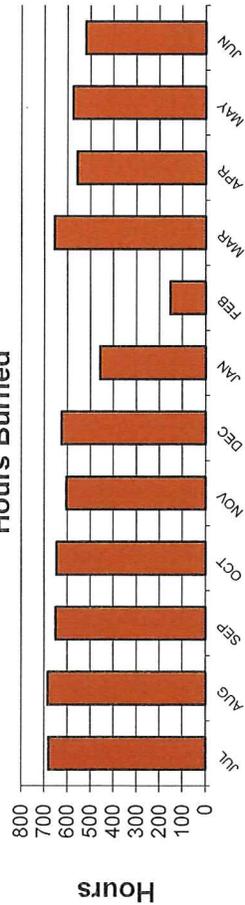
BFP Cake %TS



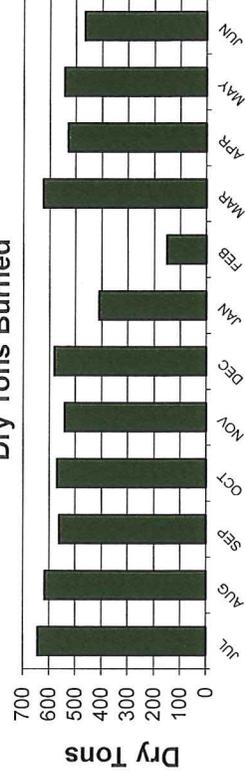
Burn Rate



Hours Burned



Dry Tons Burned



## Hydroelectric Performance Measures

<b>Billing Date</b>	<b>FBR Flow Rate (cfs)</b>	<b>Hydro Power (KWH)</b>	<b>Hydro Power Value (\$)</b>
JUL	53,010	903,220	\$51,980
AUG	47,610	840,968	\$47,604
SEP	27,131	356,563	\$15,065
OCT	43,015	0	(\$50,000)
NOV	61,630	0	(\$3,000)
DEC	80,260	673,786	\$34,217
JAN	122,530	672,490	\$36,003
FEB	149,850	596,747	\$30,984
MAR	88,060	688,868	\$36,381
APR	102,715	684,574	\$35,871
MAY	127,740	682,188	\$36,008
JUN	68,080	678,935	\$35,351
<b>TOTALS</b>		<b>6,778,339</b>	<b>\$306,464</b>
<b>Average</b>	<b>80,969</b>	<b>564,862</b>	<b>\$25,539</b>