



STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES

Memphis Environmental Field Office
8383 Wolf Lake Drive
Bartlett, TN 38133
Phone 901-371-3000 Statewide 1-888-891-8332 Fax 901-371-3170

April 8, 2024

Mr. Cliff Norville
Director of Public Works
1079 Mullins Station Road
Memphis, TN 38134

Re: Compliance Evaluation Inspection
 Memphis-Chapel Hill S.D. STP
 NPDES Permit No. TN0026361
 Shelby County

Dear Mr. Norville:

On Wednesday, March 13, 2024, Ms. Brittany Gibson with the Division of Water Resources, Memphis Environmental Field Office (DWR/MEFO), conducted a Compliance Evaluation Inspection (CEI) of the Memphis-Chapel Hill S.D. Sewage Treatment Plant (STP). Upon arrival at the Shelby County Roads, Bridges, and Engineering Building, Ms. Gibson met with Mr. Chris Masin, P.E., Senior Engineer, and stated that the purpose of the visit was to evaluate the facility's compliance with its National Pollutant Discharge Elimination System (NPDES) permit. This was accomplished by reviewing the facility's self-monitoring records and reports stored on site at the Shelby County Roads, Bridges, and Engineering Building. Afterwards, Ms. Gibson met with Mr. Randy Crawford, Certified Wastewater Operator in Charge, and Mr. Atonious Poole, Crew II Leader, to conduct an inspection of the Memphis-Chapel Hill S.D. STP. Attached you will find the Compliance Evaluation Inspection report and corresponding photo documentation which summarize the findings of the CEI. The following are items to note regarding the inspection:

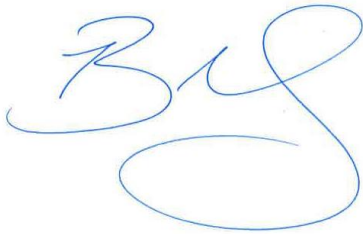
- The treatment system had sixteen (16) exceedances of its permit limits during the period of February 2019 through December 2023. Nine (9) exceedances occurred prior to November 2021 while the STP was managed by the City of Memphis. Seven (7) exceedances have occurred from November 2021 – present since the

Shelby County Government has obtained site management.

- The outfall sign was affixed to the front of the fence enclosing the STP. The information on the sign was consistent with the requirements of the NPDES permit. However, it is recommended that an additional sign be added in place at the effluent discharge point going into Crooked Creek.
- The pH calibration buffers were all expired. Also, there was no calibration logbook being maintained on site. *It should be noted that since the date of this inspection, Mr. Crawford has verified that replacement pH buffer standards have been ordered and should arrive the week of April 1st.*
- Although the entry to the wet well building and the staircase path to the treatment system were easily accessible, a safety hazard/concern was observed. There was a copious number of wasps flying around the side of the wet well building and the side of the aeration basin attempting to make a nest. It is recommended that these potential wasp nests be removed for the safety of the operators and the inspector.

The Division appreciates Mr. Masin, Mr. Crawford, and Mr. Poole's cooperation and assistance during the inspection and the County's continued efforts to comply with its NPDES permit requirements. If you have any questions or comments regarding the inspection, please contact me at (901) 633-6931 or Brittany.Gibson@tn.gov.

Sincerely,



Brittany Gibson
Environmental Scientist II
Division of Water Resources
Memphis Environmental Field Office

cc: TDEC/DWR/MEFO – File

ec: Chris Masin, P.E. – Senior Engineer
Randy Crawford – Certified Wastewater Operator in Charge
Atonious Poole – Crew Leader II

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

Division of Water Resources

Memphis Environmental Field Office
8383 Wolf Lake Drive, Bartlett, TN 38133
1-888-891-8332 (TDEC)

Compliance Evaluation Inspection for Individual NPDES Permit

Facility Name: Memphis-Chapel Hill S. D. STP	NPDES Tracking Number: TN0026361
Permit Effective Date: August 1, 2022	Permit Expiration Date: July 31, 2027
Date of Inspection: 3/13/2024	Inspector Name: Brittany Gibson

Official Contact Person Name: Cliff Norville, Director of Public Works	
Address: 1079 Mullins Station Road, Memphis, TN 38134	Phone Number: (901) 222-7850
	Email: cliff.norville@shelbycountyttn.gov

Summary of Findings and Comments

On Wednesday, March 13, 2024, Brittany Gibson with the Division of Water Resources, Memphis Environmental Field Office (DWR/MEFO), conducted a Compliance Evaluation Inspection (CEI) at the Memphis-Chapel Hill S.D. Sewage Treatment Plant (STP) located in Shelby County, Tennessee. Ms. Gibson met with Mr. Chris Masin, P.E., Senior Engineer, at the Shelby County Roads, Bridges, and Engineering Building to review the STP’s monitoring records and discuss its self-monitoring program. Afterwards, Ms. Gibson met with Mr. Randy Crawford, Certified Wastewater Operator in Charge, and Mr. Atonious Poole, Crew II Leader, to conduct an on-site inspection at the Memphis-Chapel Hill S.D. STP. The following is a summary of the findings and observations:

I. Permit

The NPDES permit for the Memphis-Chapel Hill S.D. STP with permit number TN0026361 expires on July 31, 2027. A digital copy of the NPDES permit was available for review at the Shelby County Roads, Bridges, and Engineering Building.

The NPDES permit authorizes the discharge of treated wastewater effluent from Outfall 001 into an unnamed stream at mile 0.2 to an unnamed tributary at mile 2.1 to Crooked Creek at mile 3.0.

The design capacity of the treatment system is 0.045 Million Gallons per Day (MGD). From February 2019 through December 2023, the average monthly flow from the treatment system was 0.016 MGD and the maximum daily flow was 0.069 MGD, recorded in February 2019.

The Memphis-Chapel Hill S.D. STP discharge effluent characteristic and monitoring requirements are as follows:

- Dissolved Oxygen (DO) – Five Per Week Grab
- pH – Two Per Week Grab
- Total Suspended Solids (TSS) – Twice Every Month Grab
- Settleable Solids – Two Per Week Grab
- Total Nitrogen (N), Ammonia – Twice Every Month
- Total Phosphorus – Quarterly Grab
- Flow – Five Per Week Instantaneous
- Total Residual Chlorine (TRC) – Five Per Week Grab
- E. coli – Twice Every Month Grab
- CBOD – Twice Every Month Grab

II. Records/Reports

Site records and reports for the STP were observed and appeared to be maintained digitally on site at the Shelby County Roads, Bridges and Engineering Building as required by the NPDES permit. Sampling and analytical data, including flow records, Discharge Monitoring Reports (DMRs), and Monthly Operation Reports (MORs) for the period from February 2019 through December 2023 were reviewed and appeared to be complete. As of the date of this inspection, the Memphis-Chapel Hill S.D. STP was reporting their DMRs via NetDMR successfully.

Site records prior to November 2021 were also reviewed. The City of Memphis maintains these records digitally.

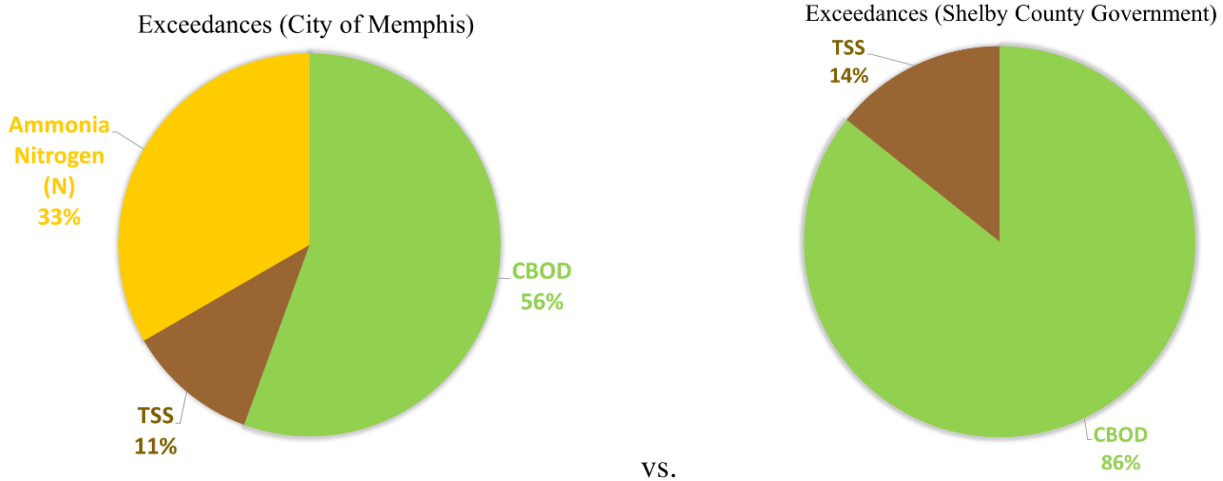
III. Facility Site Review

The Memphis-Chapel Hill S.D. STP consists of a compact package sewage treatment plant (photo 1) followed by two aeration basins (photo 2) and a clarifier (photo 3). The effluent from the clarifier is then treated via a series of trickling filters (photo 4). The effluent from the trickling filters is disinfected (photo 5) and then de-chlorinated (photo 6) prior to final discharge into Crooked Creek. Chlorine tablets are utilized for disinfection and Sulfur Dioxide tablets are used for de-chlorination. According to Mr. Crawford, the facility anticipates the installation of an Ultraviolet (UV) light system that will be used to disinfect the effluent prior to discharge. This system upgrade will take place once pending federal funds have been disbursed.

At the time of the inspection, all six (6) trickling filters were operational. The media for the six (6) trickling filters consists of wooden boards that allows biomass to accumulate as the water passes through. According to Mr. Crawford, a secondary trickling filter system will be added to the STP. The secondary system will add three (3) additional trickling filters whose media will consist of AdvanTex® AX100 Textile Filters, which is manufactured by Orenco Systems.

Although the entry to the wet well building and the staircase path to treatment system were easily accessible, a safety hazard/concern was observed. There was a copious number of wasps flying around the side of the equipment building and the side of the aeration basin attempting to make a nest. It is recommended that these potential wasp nests be removed for the safety of the operators and the inspector.

The Memphis-Chapel Hill S.D. STP had sixteen (16) total exceedances of its permit limits from February 2019 through December 2023. Nine (9) of the STP’s exceedances occurred when the facility was still being managed by the City of Memphis. Shelby County Government took over facility management in November 2021. The STP has experienced seven (7) exceedances since being managed by Shelby County Government.



2019

February: CBOD

March: TSS, Ammonia Nitrogen (NH₃), & CBOD

November: Ammonia Nitrogen (NH₃), & CBOD

2020

October: Ammonia Nitrogen (NH₃)

November: CBOD

December: CBOD

2021

November: TSS & CBOD

December: CBOD

2022

January: CBOD

February: CBOD

March: CBOD

April: CBOD

Explanation of these exceedance events did accompany the MORs/DMRs. The permit limit exceedances were due to wasting adjustments, skimmer repair, and plant optimization occurring during the transition of management from the City of Memphis to Shelby County Government. Since May 2022, the STP has experienced zero (0) exceedance events.

IV. Effluent/Receiving Waters

At the time of the inspection, there was a discharge from the STP, and the effluent was clear.

The outfall sign (photo 8) was affixed to the front of the fence enclosing the STP. The information on the sign was consistent with the requirements of the NPDES permit. However, it is recommended that an additional sign be added in place at the effluent discharge point (photo 7) going into Crooked Creek.

V. Flow Measurement

A digital flow meter is utilized at the plant to measure the effluent flow (photo 10). The meter measures the flow in Gallons Per Day (GPD). The flow is then converted to Million Gallons per Day (MGD) and recorded on the DMR.

VI. Self-Compliance Program

According to Mr. Masin, Mr. Atonious Poole, Crew Leader II, collects the influent and effluent samples for analysis. All samples are grab samples. All analytical work is conducted at Cornerstone Laboratory located in Memphis, TN. The samples are then placed in a cooler with ice and delivered to the lab immediately after collection. A digital logbook documenting the sample collection and delivery times was available for review at the Shelby County Roads, Bridges, and Engineering Building.

Dissolved Oxygen (DO), temperature, chlorine residual and pH are field parameters routinely measured at the time of sample collection.

VII. Compliance Schedule

The treatment system is not under any compliance schedule currently, except for its NPDES permit requirements.

VIII. Laboratory

All analytical work is conducted at Cornerstone Laboratory located in Memphis, TN.

Calibration of the pH and DO meters was observed. Three pH buffers (4, 7, and 10) are utilized in the calibration of the pH meter. However, the buffers being used for calibration were expired. Ms. Gibson brought this to the attention of Mr. Crawford and Mr. Poole and recommended that valid buffers be ordered soon and that the expiration dates be recorded and checked routinely. *It should be noted that since the date of this inspection, Mr. Crawford has verified that replacement pH buffer standards have been ordered and should arrive the week of April 1st.* The calibration logs for the pH meter and the DO meter could not be observed because there was no logbook being maintained by the STP. According to Mr. Crawford, he does record the calibration results on a scrap sheet of paper daily and then stores the paper in a file folder at the Shelby County Roads, Bridges, and Engineering Building. However, Mr. Crawford nor Mr. Masin had immediate access to the physical file folder due to the process of moving into a new office building and digital file conversion of facility records. Ms. Gibson reminded Mr. Crawford and Mr. Masin that, per sections 1.2.4. and 1.2.5. of the STP's NPDES permit, logbooks for the calibration, maintenance, and recording of results should be retained by the permittee. The DO meter calibration was demonstrated, and the calibration standards were valid.

It is also recommended that the MSDS/SDS sheets for the chemicals (photo 9) housed in the storage shed on site be laminated and placed on the walls within the storage shed for easy access to pertinent safety information.

IX. Operations and Maintenance

The treatment system appeared to be operating properly at the time of the inspection.

X. Sludge Handling

According to Mr. Crawford, the wasted sludge from the clarifier is hauled off by Mid South Septic Service located in Arlington, TN. The wasted clarifier sludge is hauled off as needed or once the sludge blanket depth reaches 3 or 4 ft.

Photographic Log


Facility Name: Memphis-Chapel Hill S.D. STP		Site Location: 9856 Bette Lu Drive Millington, TN 38053	Tracking No.: TN0026361
Photo No. 1	Date 3-13-2024	DIRECTION 39 deg(T) 35.35272°N 089.73439°W ACCURACY 5 m DATUM WGS84	
Description View of the compact package STP.		2024-03-13 12:58:23-05:00	



Facility Name: Memphis-Chapel Hill S.D. STP		Site Location: 9856 Bette Lu Drive Millington, TN 38053	Tracking No.: TN0026361
Photo No. 2	Date 3-13-2024	DIRECTION 126 deg(T) 35.35280°N 089.73429°W ACCURACY 5 m DATUM WGS84	
Description View of one of the aeration basins.		2024-03-13 13:05:30-05:00	





Photographic Log

Facility Name: Memphis-Chapel Hill S.D. STP		Site Location: 9856 Bette Lu Drive Millington, TN	Tracking No.: TN0026361
Photo No. 3	Date 3-13-2024		
Description View of the clarifier.			

Facility Name: Memphis-Chapel Hill S.D. STP		Site Location: 9856 Bette Lu Drive Millington, TN	Tracking No.: TN0026361
Photo No. 4	Date 3-13-2024		
Description View of the trickling filters.			

Photographic Log

Facility Name: Memphis-Chapel Hill S.D. STP		Site Location: 9856 Bette Lu Drive Millington, TN	Tracking No.: TN0026361
Photo No. 5	Date 3-13-2024	DIRECTION 35.35295°N ACCURACY 5 m 122 deg(T) 089.73430°W DATUM WGS84	
Description View of the disinfection basin. Chlorine tablets are used for disinfection.			
		2024-03-13 13:10:13-05:00	

Facility Name: Memphis-Chapel Hill S.D. STP		Site Location: 9856 Bette Lu Drive Millington, TN	Tracking No.: TN0026361
Photo No. 6	Date 3-13-2024	DIRECTION 35.35301°N ACCURACY 5 m 125 deg(T) 089.73431°W DATUM WGS84	
Description View of the de-chlorination basin. Sulfur dioxide tablets are used to de-chlorinate the effluent.			
		2024-03-13 13:11:53-05:00	

Photographic Log

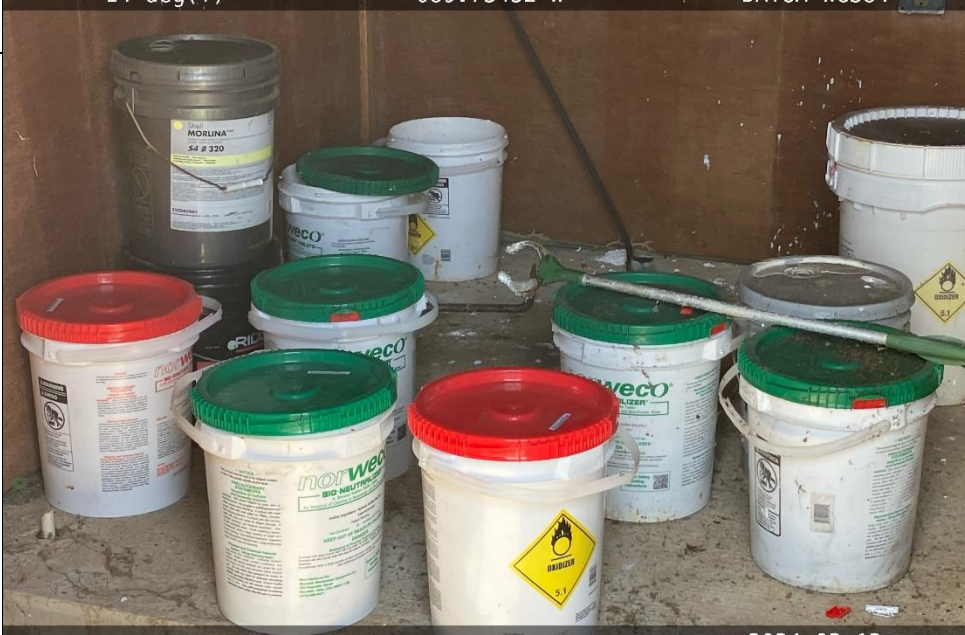
Facility Name: Memphis-Chapel Hill S.D. STP		Site Location: 9856 Bette Lu Drive Millington, TN		Tracking No.: TN0026361	
Photo No. 7	Date 3-13-2024	DIRECTION 108 deg(T)	35.35302°N 089.73426°W	ACCURACY 5 m DATUM WGS84	
Description View of the effluent discharge point. The effluent was clear at the time of the inspection. It is recommended that an additional sign be added in place here as at the effluent discharges into Crooked Creek.		2024-03-13 13:12:41-05:00			




Facility Name: Memphis-Chapel Hill S.D. STP		Site Location: 9856 Bette Lu Drive Millington, TN		Tracking No.: TN0026361	
Photo No. 8	Date 3-13-2024	DIRECTION 39 deg(T)	35.35269°N 089.73441°W	ACCURACY 4 m DATUM WGS84	
Description View of the sign at the outfall. The information on the sign was consistent with the requirements of the NPDES permit.		2024-03-13 12:59:31-05:00			



Photographic Log

Facility Name: Memphis-Chapel Hill S.D. STP		Site Location: 9856 Bette Lu Drive Millington, TN		Tracking No.: TN0026361
Photo No. 9	Date 3-13-2024	DIRECTION 14 deg(T)	35.35295°N 089.73432°W	ACCURACY 5 m DATUM WGS84
<p>Description</p> <p>View of the stored treatment chemicals. It is recommended that the MSDS/SDS sheets for the chemicals housed in the storage shed on site be laminated and placed on the walls within the storage shed for easy access to pertinent safety information.</p>				
		2024-03-13 13:11:34-05:00		

Facility Name: Memphis-Chapel Hill S.D. STP		Site Location: 9856 Bette Lu Drive Millington, TN		Tracking No.: TN0026361
Photo No. 10	Date 3-13-2024	DIRECTION 127 deg(T)	35.35281°N 089.73434°W	ACCURACY 5 m DATUM WGS84
<p>Description</p> <p>View of the effluent digital flow meter.</p>				
		2024-03-13 13:14:28-05:00		