

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
 WATER DIVISION – INDUSTRIAL AND MUNICIPAL SECTIONS
NONCOMPLIANCE NOTIFICATION FORM

PERMITTEE NAME: Leeds WWTP PERMIT NO: AL0067067
 FACILITY LOCATION: 800 Helen Street Leeds, AL (Jefferson County)
 DMR REPORTING PERIOD: December 2014

1. DESCRIPTION OF DISCHARGE: (Include outfall number (s))

Outfall 0011 - There was an upset which resulted in a discharge that exceeded the permitted ammonia concentration limit.

2. DESCRIPTION OF NON-COMPLIANCE: (Attach additional pages if necessary):

LIST EFFLUENT VIOLATIONS (If applicable)			
Outfall Number (s)	NONCOMPLIANCE PARAMETER(S)	Result Reported (Include units)	Permit Limit (Include units)
Outfall 0011	Ammonia, Total (As N) Weekly Average	8.95 mg/l	4.5 mg/l
LIST MONITORING / REPORTING VIOLATIONS (If applicable)			
Outfall Number (s)	NONCOMPLIANCE PARAMETER(S)	Monitoring / Reporting Violation (Provide description)	

3. CAUSE OF NON-COMPLIANCE (Attach additional pages if necessary): See attachment
4. PERIOD OF NONCOMPLIANCE: (Include exact date(s) and time(s) or, if not corrected, the anticipated time the noncompliance is expected to continue): The period of non-compliance includes the week December 14-20, 2014.
5. DESCRIPTION OF STEPS TAKEN AND/OR BEING TAKEN TO REDUCE OR ELIMINATE THE NONCOMPLYING DISCHARGE AND TO PREVENT ITS RECURRENCE (attach additional pages if necessary): See attachment

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

David Willoughby, Leeds WWTP Superintendent
 NAME AND TITLE OF RESPONSIBLE OFFICIAL (type or print)

David Willoughby / 12/27/2014
 SIGNATURE OF RESPONSIBLE OFFICIAL / DATE SIGNED

ATTACHMENT

3. CAUSE OF NON-COMPLIANCE (Attach additional pages if necessary):

The weekly average ammonia concentration violation was caused by a biological upset in the activated sludge process. The weekly loading limit was not exceeded. The cause of the upset has been identified as equipment failure coupled with neglect-of-duty on the part of two operational staff and is further described below. The WWTP is staffed with certified WWTP operators 10-hours per day seven days per week.

The WWTP was constructed with two 2.5 MG aeration basins and only one is typically operated as shown in photo below. The active aeration basin (basin #2) experienced mechanical failures on two of the four brush rotors, so at approximately 8:30 a.m. Wednesday December 10, 2014, flow was transferred to basin #1. On Wednesday December 10, 2014, the instrumentation staff worked on the dissolved oxygen (D.O.) probe but could not complete the calibration because basin #1 was not yet full of water. The WWTP operational staff was instructed to monitor the system to make sure it operated correctly when it came into contact with the water because the brush rotor aerators are automatically controlled (turned on/off) by D.O. levels that are continuously monitored. The D.O. probe consistently read a false level between 1.5-1.6 mg/l which is below the set-point that turns on the rotors. The brush rotors did not operate from December 10, 2014 until 8:42 a.m. on December 15, 2014 when they were manually turned on by the Monday shift supervisor. The operators who worked between Thursday and Sunday failed to recognize the rotors did not run even though they recorded zero run hours on their daily log sheets. The operators were confused because SCADA showed animation with the aerators running. During this five day period, the aerobic nitrifying bacteria were stressed by the anaerobic conditions that had developed in basin #1. By Monday December 15, 2014, the basin had developed an odor and had settled solids because the submersible mixers do not provide complete mixing without the rotors in service.

Upon discovery Monday morning December 15, 2014, the WWTP Shift Supervisor immediately started effort to restore the aerobic biology. All four rotors were turned on manually. Because the rotors in basin #1 had not exercised under load for almost two years while basin #2 was in service, rotor motors 1-1 and 1-2 failed when loaded and the circuit breaker for rotor 1-1 was found to be defective. With two of the four rotors out of service on basin #1, adequate D.O. was not able to be supplied to quickly overcome the anaerobic conditions. Two motors from basin #2 were relocated to basin #1 on December 18, 2014 and the circuit breaker was replaced the next day. Effluent samples taken on Thursday December 17, 2014 revealed the effluent ammonia concentration was 8.3 mg/l, well above the weekly average limit of 4.5 mg/l. Sample results from the 18th-20th were 9.3 mg/l, 9.2 mg/l, and 9.0 mg/l respectively.



5. DESCRIPTION OF STEPS TAKEN AND/OR BEING TAKEN TO REDUCE OR ELIMINATE THE NONCOMPLYING DISCHARGE AND TO PREVENT ITS RECURRENCE (attach additional pages if necessary):

Timeline of Events

Upon discovery Monday morning December 15, 2014, the WWTP Shift Supervisor immediately started effort to restore the aerobic biology. All four rotors were turned on manually. Because the rotors in basin #1 had not been exercised under load for almost two years while basin #2 was in service, rotor motors 1-1 and 1-2 failed when loaded and the circuit breaker for rotor 1-1 was found to be defective. With two of the four rotors out of service on basin #1, adequate D.O. was not able to be supplied to quickly overcome the anaerobic conditions. Two motors from basin #2 were relocated to basin #1 on December 18, 2014 and the circuit breaker was replaced the next day. By December 19, 2015 all four rotors and all mixers were running continuously. Effluent samples were collected for the 17th-21st.

On Monday the 22nd, the sample results were available and indicated the biology was still stressed and not nitrifying adequately. The Environmental Services Department became aware that the weekly average limitation had been exceeded. Daniel White, Deputy Director, notified Nicholas Caraway of ADEM via email. Instructions were provided to the Barton Lab staff to start daily water quality tests upstream and downstream of the 0011 outfall on the Little Cahaba. The Environmental Services Department contacted Paul A. Pitt, PhD, PE, Vice President and Wastewater Process Design Director for Hazen and Sawyer and received guidance on actions that could be taken and tests and analysis to be performed. Plans were developed to truck in Waste Activated Sludge (WAS) from the Trussville WWTP in 6,000 gallon loads and return partially digested WAS from the aerobic digester to replenish the nitrifier population. The mixed liquor suspended solids (MLSS) within the basin was to be raised from 1,200 mg/l to 3,000 mg/l; wasting was to be stopped until the target was met; the D.O. was to be held above 3 mg/l; the pH was to be monitored; and a process control sampling plan was prepared.

On Tuesday the 23rd, 18,000 gallons (3 loads) of hauled WAS was introduced into the basin #1 and roughly 29,500 gallons of WAS was returned from the aerobic digester to the headworks and pumped to the aeration basin. Process control samples collected at 12:30 p.m. resulted in ammonia concentrations of 3.57 mg/l within the basin and 4.94 mg/l from the sand filters. An ammonia probe and meter was relocated from the Cahaba River WWTP BNR basin that is out-of-service for construction to the basin #1. The ammonia probe provided a mechanism for the operational staff to quickly assess changes in the basin.

On Wednesday the 24th, Christmas Eve, 24,000 gallons of hauled WAS was introduced into the basin #1 and roughly 14,500 gallons of WAS was returned from the aerobic digester to the headworks and pumped to the aeration basin. Process control samples collected at 9:30am resulted in ammonia concentrations of 0.0 mg/l within the basin and 0.2 mg/l from the sand filters. The MLSS was raised to 1550 mg/l. The average ammonia probe reading was 0.1 mg/l.

On Thursday the 25th, Christmas Day, roughly 7,200 gallons of WAS was returned from the aerobic digester to the headworks and pumped to the aeration basin. The MLSS was raised to 1790 mg/l. The average ammonia probe reading was 0.1 mg/l.

On Friday the 26th, 24,000 gallons of hauled WAS was introduced into the basin #1. Process control samples collected at 10:30am resulted in ammonia concentrations of 0.0 mg/l within the basin and 0.0 mg/l from the sand filters. The MLSS was raised to 1780 mg/l. The average ammonia probe reading was 0.1 mg/l.

The following table shows the December results for ammonia.

Date	mg/l	lbs
12/1/2014	0.0	0.0
12/2/2014	0.0	0.0
12/3/2014	0.0	0.0
12/8/2014	0.0	0.0
12/9/2014	0.1	1.2
12/10/2014	0.1	1.3
12/17/2014	8.3	65.0
12/18/2014	9.3	65.0
12/19/2014	9.2	65.4
12/20/2014	9.0	66.8
12/21/2014	9.3	71.3
12/22/2014	8.7	59.1