



May 14, 2018

Brian Haines  
Essentia Protein Solutions  
2425 SE Oak Tree Court  
Ankeny, Iowa 50021

**LETTER OF NON COMPLIANCE: Standard Condition No. 11, Operation Permit**

**SUBJECT: Wastewater and Air Quality Complaint Investigation, Operation Permit No. 8300100  
Complaint Nos. 25249, 25399, 25421, 25422, 25423  
Staff Action Nos. 126724, 127498, 127586, 127587, 127590  
Shelby County**

Dear Mr. Haines,

For the past several months, the Iowa Department of Natural Resources (DNR) and the City of Harlan have received multiple complaints regarding the odor at the Essentia plant located in Shelby County. On behalf of the DNR Field Office 4 (FO4), I conducted an investigation on May 3, 2018, at which time I met with John Abell, Plant Manager, Al Leinen, Supervisor, and Erik Johnson, Engineer. The purpose of the investigation was to determine if the wastewater treatment facility was being operated and maintained appropriately. As I stated during the investigation, an indicator of odor *may* be an indicator of a wastewater facility that is not being maintained. Photos of the wastewater treatment facility are attached to this letter.

During my May 2018 investigation, I inspected the wastewater treatment facility; which includes: a dissolved air flotation (DAF), two anaerobic lagoons, and three aerobic lagoons. Additionally, while not inspected, this facility also has a clean in place (CIP) system. The DAF was recently installed and became operational in 2016. As we discussed, the DAF should be drained, cleaned, and inspected, at a minimum, on an annual basis. The anaerobic lagoons were constructed in the 1960's. During a routine inspection that I conducted on March 9, 2015, I noticed that the anaerobic lagoons had never been cleaned out which results in overloading of the wastewater lagoons. Since that time, the north anaerobic lagoon was excavated of solids; however, the south anaerobic lagoon was not completed and is currently not in use. The three aerobic lagoons had adequate freeboard during this inspection. I did not observe anything unusual with the performance of the aerobic lagoons. The CIP was installed pre-March 9, 2015. At that time it was reported that the system was used about once every two weeks and generated about 200,000 gallons of water. It was also reported that the system was generating more water than was originally anticipated, which contributed to the overloading of the wastewater lagoons. During this inspection, Mr. Abel stated that the CIP is used weekly and sometimes more often depending on the type of production occurring in the facility.

Anaerobic lagoons are designed to have layers: a cap of scum, sludge, and other floating material on the top. The top cap of the anaerobic lagoon should keep the odor sealed inside. The anaerobic bacteria breaks down the organic matter in the effluent, which releases carbon dioxide and methane. The sludge is taken to the bottom of the pond by the sedimentation process. System performance and efficiency

depends on loading conditions, temperature conditions, volumetric loading, and whether the pH is maintained within the optimum range. When the process is stressed by shock loads or temperature fluctuations, methane bacteria activity occurs more slowly and an imbalance occurs. If higher loading is applied, the levels of sulfate and odor can increase. High sulfate concentrations in water can create more hydrogen sulfide gas. Anaerobic ponds need to maintain a pH reading high enough to continue decomposition. Acidic ponds (low pH) generally need to be neutralized because a low pH can greatly impact on decomposition. The pH value should range from 6.6-7.6 but should not drop below 6.2. Sudden fluctuations of pH will inhibit lagoon performance.

I obtained samples of the wastewater on May 9, 2018, I will forward the results to you when I receive them. However, during my May 2018 visit the pH of the wastewater from the plant entering the DAF was 7.8 with a temperature of 120. The pH of the wastewater entering the north anaerobic lagoon was 5.2 and the temperature was 120. The pH of the wastewater leaving the anaerobic lagoon was 6.1 with a temperature of 115.

Additionally, the daily average and maximum design flow for the entire wastewater system is 0.15 million gallons (MG). According to the monthly operation reports submitted by Essentia, between November 2016 and March 2018, the average daily flow to the anaerobic lagoons was approximately 0.105 MGs with a maximum daily flow of approximately 0.219 MGs. The flow is periodically exceeding the design flow for the entire wastewater system. Additionally, the south anaerobic lagoon is not being used. The design 5 day biological oxygen demand (BOD5) for the facility is 1,500 lbs/day. The facilities Operation Permit requires sampling of CBOD5. The average CBOD5 loading between November 2016 and March 2018, was 9,615 lbs/day and the maximum CBOD5 was 15,507 lbs/day. However, it should be noted that in January and February 2017, the monthly average CBOD5 was 25,000 lbs/day and the maximum was reported at 40,000 lbs/day.

The CIP may result in a fluctuation of flow and pH that could also be affecting the performance of the DAF and/or the anaerobic lagoons. An internal evaluation should be completed at the facility to determine if the CIP is having a negative affect on the wastewater lagoons.

Please submit an update to the DNR **no later than June 15, 2018** documenting all actions taken at the facility. The information I provided above (numbers 1 through 7) are merely suggestions. However, the actions taken by Essentia must document compliance with Standard Condition No. 11, of the Operation Permit. This condition states, "All facilities and control systems shall be operated as efficiently as possible and maintained in good working order. A sufficient number of staff, adequately trained and knowledgeable in the operation of your facility shall be retained at all times and adequate laboratory controls and appropriate quality assurance procedures shall be provided to maintain compliance with the conditions of this permit."

As we discussed, the odor may be the result of a combination of items that should be addressed, including but not limited to:

- 1) The wastewater lagoons are handling more wastewater than what they were designed to handle;
- 2) Both anaerobic lagoons should be used not just one;
- 3) An evaluation of the anaerobic lagoons should be completed to determine if a retention time of more than one day would aid in lagoon performance;

- 4) The pH of the wastewater from the DAF should be maintained between 6.5 and 7 and the pH in the anaerobic lagoon should be maintained within the optimum range of between 6.6 and 7.6. An NaOH compound may be needed to neutralize the wastewater or an odor may be generated;
- 5) The DAF should be cleaned out;
- 6) The internal process and use of the CIP should be evaluated;
- 7) Sludge depth in the anaerobic lagoons should be determined annually. Solids accumulate in the lagoon bottom and require removal on an infrequent basis, depending on the amount of inert material in the influent and the temperature of the wastewater.

Since the beginning of the complaint investigation, Essentia has hired a Grade 4 Wastewater Operator, to properly maintain and operate the wastewater treatment facility. Additionally, the DAF has been pumped out and cleaned and the south anaerobic lagoon is starting up again. If proper WW maintenance does not quell the odor complaints, then covering the anaerobic lagoons to capture gases might help with odor issues.

Additionally, one of the complaints FO4 received alleged that “blood is flowing to the man made pit on the east side of the building.” It should be noted that according to Mr. Johnson, there is no blood at this facility. Additionally, I did not see a man made pit on the east side of the building. Of interest, on February 27, 2017, Mr. Johnson reported a process wastewater (WW) bypass at Essentia. The bypass was caused by a plugged overflow drain line from the plant lift station. The drain line was being used during maintenance activities and blockage of it resulted in backup of the drain line and discharge from an access manhole. From the manhole, the WW flowed across pavement into a storm water inlet structure where it flowed to a drainage ditch. Since then, the access manhole has been sealed shut to prevent overflows. Additionally, an emergency line was installed in a portion of the collection system line that discharges directly into the furthest north lagoon. If the lines from the plant become plugged again, the wastewater will automatically flow into the north lagoon. Photos are below.



Photos 1 and 2: Looking at the sealed manhole and the emergency outlet to the north lagoon



Photos 3 and 4: Looking at the manhole emergency overflow to the lagoon

If you have any questions, please do not hesitate to contact me via telephone at (712) 243-1934 or email [alison.manz@dnr.iowa.gov](mailto:alison.manz@dnr.iowa.gov) .

Sincerely,

Alison Manz,  
Environmental Specialist  
DNR Field Office 4 – Atlantic

Enc. Photos (2 pages)

CC John Crotty, Attorney, DNR Wallace State Office Building, Des Moines, Iowa 50319  
Eric Wiklund, Supervisor, DNR NPDES Section, Wallace State Office Building  
Satya Chennupati, Supervisor, DNR WW Engineering Section, Wallace State Office Building  
John Abell, On-Site Plant Manager, Essentia, 1347 Highway 44, Harlan, IA 51537  
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Erik Johnson, Essentia Protein Solutions, 2425 SE Oak Tree Ct., Ankeny, Iowa 50021  
City of Harlan, PO Box 650, Harlan, IA 51537  
Complainants (3)  
EPA (2)(VIA EMAIL)  
Facility File

File Name: Harlan050318.ww.essentia investigation.manz.doc

**Suspense: June 15, 2018 – Update sent to FO4 (Ch. 64)**

Observations from the May 2018 investigation below:



Photos 5 -7: Looking at the equipment associated with the DAF



Photos 8 -10: Looking at the equipment associated with the DAF



Photos 11 and 12: Looking at the two aerobic lagoons

Photo 13: Looking at the anaerobic lift station



Photos 14 and 15: Looking at the anaerobic control structures

Photo 16: Looking at the north aerobic lagoon