

REPORT OF COMPLIANCE SAMPLING INSPECTION (CSI)

AT
ADM-Deerfield
17700 S. Highway T
Deerfield, MO 64741

NPDES NO: MO-0134139

April 11 – 13, 2023

BY
U. S. ENVIRONMENTAL PROTECTION AGENCY
Region 7
Enforcement and Compliance Assurance Division (ECAD)

INTRODUCTION

I performed a Compliance Sampling Inspection (CSI) at the ADM-Deerfield Bio-diesel facility from April 11, 2023, through April 13, 2023. The inspection was authorized by Section 308(a) of the Federal Water Pollution Control Act, as amended. This narrative report presents the findings of the inspection.

PARTICIPANTS

ADM-Deerfield (ADM)

Thomas Weier, Plant Manager (417) 927-3400 ext. 13109

Email: tom.weier@adm.com

Mirriah Cooper, EHS Coordinator

Email: mirriah.cooper@adm.com

U. S. Environmental Protection Agency (EPA)

Joe Heafner, Life Scientist (913) 551-7091

Email: heafner.joseph@epa.gov

PROCEDURES

On April 11, 2023, I arrived at the ADM facility unannounced at approximately 8:35 a.m. and asked to speak with the person responsible for the environmental affairs for the facility. The receptionist called for Mr. Weier and Ms. Cooper and escorted me to a conference room while I waited for them to arrive. After Mr. Weier and Ms. Cooper arrived, I introduced myself, presented my credentials, and explained the purpose and procedures of the inspection. These

procedures included completing a comprehensive inspection of the wastewater treatment systems for ADM and a stormwater inspection. I explained that the inspection would include a facility walk-through with photos (attachment 1), a check of the self-monitoring records, and the collection of samples from Outfall 003, the process wastewater tanked to the city of Fort Scott Kansas and an exit interview.

On April 11 and 12, 2023, I took grab samples from the discharge of Outfall 003 and from the sampling port on a tank that is used stage process wastewater from the lagoon designated as Outfall 006 before it is pumped into a tanker truck and transported to the City of Fort Scott, Kansas for treatment. I collected the samples for Outfall 003 into clean, pre-labeled containers for the analysis of Biochemical Oxygen Demand (BOD), Oil and Grease, Chloride, and Sulfate. I collected the samples for Outfall 006 into clean, pre-labeled containers for the analysis of Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Non-Filterable Solids (NFS), Ammonia, Total Phosphorus, Total Kjeldahl Nitrogen, Nitrates + Nitrites, and Total Nitrogen (by calculation). I measured the pH and temperature in a separate grab sample using a field meter.

On April 11, and 12, 2022, I placed the samples I collected on ice in an ice chest, sealed the container and shipped it overnight to the EPA Region 7 Science and Technology Center (STC) for analysis. I followed Region 7 LSASD standard operating procedures in the collection, packaging, transportation, and handling of the samples. Field Sheets and Chain of Custody forms were electronically submitted each day following Region 7 procedures. All samples arrived at the STC within proper holding times.

FACILITY DESCRIPTION

ADM-Deerfield is owned by the Archer Daniels Midland (ADM) Corporation. The facility is a soybean crushing mill, oil refinery, and biodiesel manufacturing facility and is located 4 miles west of Deerfield, Missouri. The mailing address for the facility is 17700 S. Highway T, Deerfield, MO 64741.

The facility began operation in 2007 as Prairie Pride, Inc. but shut down in February 2010. The facility was purchased by ADM on May 5, 2011, who resumed production in July 2011. The plant is operated around the clock, 360 days per year. The plant site covers 210 acres. The facility has the capacity to produce 60 million gallons of biodiesel per year, with actual production of 50-55 million gallons. See attachment 2 for facility map showing the layout for the facility.

Soybeans are received by truck or rail and processed through the prep area. The soybeans are crushed and the flakes are conveyed to the extraction building, where oil is extracted using hexane. The resultant crude oil is stored in a large tank and sent to the refinery where it is converted to degummed soybean oil. This oil is then sent to the biodiesel building through a continuous process using methanol and sodium methylate. Byproducts of crush, refining & biodiesel production processes are glycerin, soap stock; soy hull pellets and soy meal are sold

and shipped out by truck and/or rail. Product biodiesel is stored in two large onsite tanks and loaded out by both truck and rail.

Water used for plant processes is pumped 12 miles from Fort Scott, Kansas. This water, treated effluent from Fort Scott WWTF, is treated with Sodium Hypochlorite prior to use in the cooling tower, additional Sodium Hypochlorite is added to the cooling tower, as non-contact process water is returned. Water for the boilers is further treated by microfiltration, reverse osmosis (RO) and softeners.

A description of the discharge for each outfall is listed below.

Outfall 001: Stormwater discharge only. Storm water runoff from the west side and central areas of the plant property, which flows through a sedimentation basin prior to leaving the property. Stormwater discharges from the sedimentation basin into a tributary of Grassy Run. Design flow is based on a 10-year 24 hour event and is 1.1 MGD, however, actual flow is dependent upon precipitation.

Outfall 002: Consists of a combination of stormwater flow from the east side of the facility and discharge from Outfall 003. Design flow is based on a 10-year 24 hour rain event and is 0.369 MGD, however, flow is dependent of precipitation.

Outfall 003: Wastewater from the cooling tower blowdown, boiler blowdown, softener reject and RO concentrate (reject). Process wastewater is treated in a single cell aerated lagoon before discharging into a tributary of Green Branch. Average flow based on DMRs is 0.195 MGD.

Outfall 004: Two non-discharging storage basins for domestic wastewater. The two storage basins are connected through a common pipe. The level is maintained by evaporation, with a total of 8 surface spray aerators. Wastewater is pumped and hauled by tanker trucks to the Fort Scott, KS WWTP (KS-0095923) for disposal on an as needed basis.

Outfall 005: Storm water runoff from the east side of the plant including around the loadout area. Stormwater discharges into a tributary of Green Branch. Average flow is 0.955 MGD, however, flow is dependent upon precipitation.

Outfall 006: Process wastewater consisting of contact wastewater, floor wash water, wastewater from the extraction and refinery skim pits, biodiesel sump pit, and containment structures throughout the site are pumped to a non-discharging storage basin. The capacity of the storage basin is 4.6 million gallons. The facility is to maintain at least one foot of freeboard at all times. Currently wastewater is pumped and hauled by tanker trucks to the Fort Scott, KS WWTP (KS-0095923) for disposal. Approximately four to six tanker truck loads per day (0.025 MGD) is tanked to the Fort Scott KS WWTF.

The WWTF's National Pollutant Discharge Elimination System (NPDES) Permit MO-0134139 was issued on September 1, 2017 (attachment 3), modified on September 1, 2019, and January 1, 2021. The permit expired on March 31, 2022 and has been administratively extended pending renewal.

FINDINGS AND OBSERVATIONS

The following findings were noted during the plant and record review. These findings were discussed with Mr. Weier and Ms. Cooper during the exit meeting.

Self-Monitoring Data Review:

I obtained a spreadsheet of the NetDMR data for ADM from January 2019, through March 2022, and reviewed the data. During the inspection, I also obtained an electronic copy of the facility's Discharge Monitoring Reports for the years 2019 – 2022.

Tables 1A and 1B below represents the effluent violations noted during the review.

Table 1A: &Effluent violations for Outfalls 001, 002, & 005 reported from January 2019 – December 2022

	COD	Limit (mg/L)	TSS	Limit (mg/L)
Outfall 001				
Mar-19	256	120	208	100
Sep-19	368	120	172	100
Jun-20	182	120		
Dec-21	150	120		
Outfall 002				
Mar-19	186	120		
Sep-19	162	120		
Outfall 005				
Mar-19	129	120		
Jun-20	135	120		

Table 1B: Effluent violations for Outfall 003 reported from January 2019 – December 2022

	BOD	Limit (mg/L)	Chloride	Limit (mg/L)	TSS	Limit (mg/L)
Outfall 003						
Jan-19	48.3	30/60			61.3	30/60
Feb-19	34.3	30/60	213	203	41.9	30/60
Mar-19	177.3/194	30/60	243	203	89.7/104	30/60
Apr-19	89.3/134	30/60			78.4/83.6	30/60
May-19	59.1	30/60			51.3	30/60
Jun-19					53.5	30/60
Jul-19	35	30/60	216	203	109	30/60
Sep-19	89.2	30/60			72	30/60
Oct-19					66	30/60
Nov-19					62.7	30/60
May-20					40.65	30/60
Aug-20			264/239.5	203		
Sep-20			251	203		
Nov-20			225	203		
Dec-20			222.5	203		
Jun-21			237.5	203		
Jul-21	103.6/161	30/60				
Aug-21	42.85	30/60	227.3	203		
Sep-21	78/88.6	30/60				
Oct-21	52.8	30/60				
Nov-21	70.5/109	30/60				
Dec-21	162/204	30/60				
Jan-22	86.9/118	30/60				
Feb-22	124.6/170	30/60				
Mar-22	117.9/198	30/60				
Apr-22	48.4/114	30/60				
Jun-22	33.6	30/60				
Sep-22			275.75	203		
Oct-22			280.5	203		

During the exit interview, I issued an NOPF for the effluent violations at the facility (attachment 4). ADM responded to the NOPF on April 25, 2023. ADM stated that they were aware of the effluent violations, and that they were proceeding with process changes including redirecting some waste streams to the Outfall 006 lagoon.

Sample Results

The analytical results from the inspection were received on May 12, 2023, from the Region 7 STC laboratory. This data was not discussed during the exit interview. The analytical results for the samples I collected are presented in Table 2. See attachment 5 for the analytical data packet.

Table 2A: Analytical Results for Effluent Samples Collected for Outfall 03 During Inspection

Parameter	(4/11/23) Sample # 2300101-01	(4/12/23) Sample# 2200102-01	Concentration Permit Limits⁴
BOD5 (mg/L)¹	6.29	6.24	60/30
Oil and Grease(mg/L)¹	ND	ND	12.4/9.3
Chloride (mg/L)¹	209	209	329/203
Sulfate(mg/L)¹	375	372	NA
Temperature (°C)²	19.5	19.3	NA
pH²	8.07	7.93	6.0-9.0
Flow in MGD	NA	NA	NA

¹mg/L = milligrams per liter.

²°C = degrees Celsius, pH is not to be averaged, pH was measured in the field.

⁴Permit limits for BOD and Oil and Grease are daily maximums followed by monthly averages.

Table 2B: Analytical Results for Effluent Samples Collected for Outfall 006 During Inspection

Parameter	(April 11) 2300101-03	(April 12) 2300102-03	Limits
BOD₅ (mg/L)¹	4560	4700	NA
NFS (mg/L)	448	527	NA
COD (mg/L)	7500	30400	NA
TKN (mg/L)	38.9	39.0	NA
Nitrate+Nitrate (mg/L)	0.629	0.684	NA
Total Nitrogen	39.5	39.7	NA
Ammonia (mg/L)	10.0	10.7	NA
Total Phosphorus (mg/L)	53.1	52.8	NA
Temperature (°C)²	20.8	20.6	NA
pH³	4.86	5.08	NA
Flow	NA	NA	NA

¹mg/L = milligrams per liter

²°C = degrees Celsius, Temperature was measured in the field.

³ pH is not to be averaged; pH was measured in the field.

Based on the sampling data, the facility did not violate the effluent limits set forth in the NPDES permit during the inspection. There are no specific permit limits for Outfall 006, however, the facility does have a contract with the City of Fort Scott, Kansas that does limit the amount of BOD, COD, TSS, Total Phosphorus, Total Nitrogen, and pH that can be sent to the Fort Scott WWTF.

Laboratory

The facility contracts with Pace Analytical Laboratories in Lenexa, Kansas for all of its regulatory analysis. During the inspection, I requested the laboratory records to ensure that all analysis complied with requirements of 40 CFR part 136. After receiving the data sheets, I reviewed the sheets to determine if the data sheets and DMRs were accurate. During my review, I did not note any discrepancies between the DMRs and the laboratory data sheets provided. I also reviewed the laboratory methods and noted that all methods used are consistent with Chapter 40 Part 136 of the Federal Code of Regulations.

Stormwater

The NPDES Permit does require that the facility have an SWPPP. During the inspection, I did a general review of the SWPPP documents that were available. After the inspection, Ms. Cooper provided a complete copy of the SWPPP. After reviewing the complete copy of the SWPPP, I placed the copy into the ECAD electronic file system. A partial copy of the SWPPP is provided as attachment 6. The last review and substantial update to the SWPPP by the facility was in 2022. I reviewed the SWPPP during the inspection and after the completion of the inspection and found that the SWPPP meets the requirements of the NPDES permit.

The SWPPP and permit require monthly routine inspections of the stormwater structures and best management practices implemented by the facility. During the inspection, I reviewed inspection records from 2020 through the present. After the completion of the inspection, Ms. Cooper provided electronic copies of the inspection reports reviewed. I again reviewed the inspection reports, then placed them in the EPA Region 7 ECAD electronic file system. During the inspection report review, I noted the following:

- According to Special Condition 12.(b)(iv) of the NPDES permit, “all actions taken to correct the deficiencies shall be included with the written report, including photographs.” During my review, I noted that deficiencies were observed during the monthly inspections, however, I did not note that actions to correct deficiencies were documented.
- Special Condition 12(b)(i) of the NPDES permit, operational deficiencies must be corrected within seven calendar days. While reviewing the facility inspection reports, several operational deficiencies were noted, however, it was not documented when corrective actions were taken.
- Special Condition 12.(b) requires that precipitation information for the entire period since the last inspection be noted on the inspection reports. The inspection reports reviewed did not contain precipitation information.

The SWPPP also requires that the facility maintain records of all SWPPP trainings that the facility has performed. I reviewed the training records for the facility during the inspection and noted that they were complete in accordance with the SWPPP and the permit. After the completion of the inspection, Ms. Cooper provided copies of the SWPPP training roster that was conducted in 2021 and 2022. After my review, I placed the SWPPP training records that were provided into the ECAD electronic file system.

During the inspection, I observed stormwater outfalls 001 and 005 (photos 17-21). I noted that stormwater from the south and west portions of the facility flow through a conveyance system that leads to a settling pond before being discharged through Outfall 001 (photos 11-13). I also noted that stormwater grates throughout the facility had straw waddles in place to control solids from entering the stormwater system (photo 9).

Operational Issues and Observations

The City of Fort Scott and ADM-Deerfield entered into a contract (attachment 7) to allow process wastewater to be treated by the city's WWTF under certain conditions. The contract requires that the BOD and COD not to exceed 1,500 mg/L, the TSS not to exceed 350 mg/L, Total Phosphorous not to exceed 1.5 mg/L, TKN not to exceed 10mg/L and that the pH remain between 6.0 and 9.0. The contract also states that the city will test and analyze the process wastewater at least two times per month. The city provided a spreadsheet of sampling data from ADM-Deerfield for the years 2018 – 2023. I reviewed that data and noted the following:

- In 2018, there were no exceedances in BOD, TSS or pH. COD, Total Phosphorous and TKN were not analyzed during 2018
- In 2019, there were no exceedances in BOD, TSS or pH. COD was violated 4 times during the week of November 13-18, 2019.
- In 2020, there were no exceedances in BOD, COD, TSS, Total Phosphorous, and TKN. There were 2 exceedances for pH.
- In 2021, there were no exceedances for BOD and TSS, 2 exceedances for COD, 9 exceedances for pH, 3 exceedances for Total Phosphorus, and 2 exceedances for TKN.
- In 2022, there were 15 of 24 exceedances for BOD, 23 of 24 exceedances for COD, 0 exceedances in TSS, 20 of 24 exceedances for pH, 14 of 24 exceedances of Total Phosphorus, and 14 of 24 exceedances for TKN.
- To the date of the inspection in 2023, there have been 5 exceedances of BOD, COD, Total Phosphorus, pH and 2 exceedances in TKN.

During my inspection at ADM, I noted that little to no treatment occurs within the process wastewater lagoon (photos 6-8) before trucking to the City of Fort Scott, Kansas. Process wastewater is pumped into a staging tank where according to Mr. Weier the process wastewater will be pH adjusted before being pumped into the truck-tanker and sent to Fort Scott (photo 8). Samples taken during the ADM inspection indicated that the process wastewater was very low in pH and needed considerable adjustments to reach the desired level of between 6.0 and 9.0. I also reviewed the current NPDES permit's fact sheet and noted that the lagoon is supposed to have approximately 17 surface aerators with an intent to add 4 more. The aeration of the process wastewater will aid in treatment before sending the process wastewater to Fort Scott, Kansas. During the exit briefing, I noted that the process wastewater from Outfall 006 was causing significant interference with the operation of the Fort Scott, Kansas WWTF. I also informed Mr. Weier and Ms. Cooper that a pre-treatment system may need to be put in place and that the City of Fort Scott may be required to put a proper control mechanism in place to regulate the industrial process wastewater from the ADM facility.

Process wastewater was observed leaking from the west cooling tower, flowing across the access road and into the stormwater conveyance system leading to the settling basin and eventually out through Outfall 001 (photos 14-15). During the exit briefing, I issued a NOPF for the unauthorized discharge of process wastewater through Outfall 001. In ADM's response to the NOPF, it was stated that during a plant shut down during the week of April 17, 2023, significant

repairs to the cooling tower basin were made to eliminate the ongoing unauthorized discharges of process wastewater.

Summary

The facility has experienced effluent violations from Outfalls 001, 002, 003, and 005 since 2019. The majority of the effluent violations were identified to be coming from Outfall 003. A NOPF was issued for the effluent violations.

An unauthorized discharge of process wastewater was observed during the inspection. Process wastewater from the west cooling tower was seen discharging across the access road and into the stormwater conveyance which leads to Outfall 001. A NOPF was issued for the unauthorized discharge.

Monthly stormwater inspections do not indicate if or when precipitation has occurred between inspections as required by the permit. The stormwater inspections also do not indicate that corrective actions have been taken within the time frame required by the SWPPP or permit.

The facility trucks process wastewater from Outfall 006 to the City of Fort Scott, Kansas. This process wastewater has high concentrations of both BOD and COD along with low pH. ADM consistently sends process wastewater in higher concentrations than what is allowed in a contract signed by the city and ADM. The City of Fort Scott, Kansas does not have a proper control mechanism in place to regulate the process wastewater from ADM.

**JOSEPH
HEAFNER**
Joe Heafner
Life Scientist

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JOSEPH HEAFNER
Date: 2023.06.07
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**Moran,
Nicole**
Nicole Moran
Section Chief

Digitally signed by Moran,
Nicole
Date: 2023.06.09
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Attachments:

1. Digital Photographs with Photo Log (25 pages)
2. Facility Layout (1 page)
3. NPDES permit issued September 1, 2017 (11 pages)
4. NOPF and Facility Response (5 pages)
5. Laboratory Analytical Report for Activity JAH2312 (22 pages)
6. SWPPP (30 pages)
7. 2021 ADM-Deerfield contract (19 pages)