

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Scheduled Inspection

N699629605

FACILITY: Michigan Ethanol d/b/a POET Biorefining - Caro		SRN / ID: N6996
LOCATION: 1551 Empire Drive, CARO		DISTRICT: Saginaw Bay
CITY: CARO		COUNTY: TUSCOLA
CONTACT: Ken Miceli , Plant Engineer		ACTIVITY DATE: 05/27/2015
STAFF: Sydney Bruestle	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Scheduled FCE		
RESOLVED COMPLAINTS:		

On 5/27/2015 at 8:50 am, Sydney Bruestle (EQA) and Gina McCann (EQA) of the MDEQ-AQD arrived at POET Biorefining in Caro, Michigan to perform an announced inspection of the facility. We were greeted by Ken Miceli (Technical Manager) and Arlene Thomas (EH&S Assistant) of POET.

In 2014 EPA issued POET a 114 request. After reviewing the submitted information, the EPA issued a Notice of Violation (NOV) for emissions exceedances resulting from wet scrubber down time. This violation is being addressed by the facility and the EPA.

AQD and POET staff spent the morning in the conference room going over the facility block flow diagram (see attached), and discussing items pertaining to the requirements of the Renewable Operating Permit (ROP). Time was also spent remotely viewing POET's operational parameter monitoring and data acquisition system. This was followed by a process walk through and review of emission calculations and usage records. Compliance with the requirements of the ROP is based upon the attached spreadsheet.

On 5/27/2015 the AQD reviewed required records. Based on the reviewed records it appears the facility is in compliance with air quality rules and regulations. The following discussion outlines the results of my records review.

FG FACILITY – Includes all equipment and operations at the stationary source, including exempt equipment.

Condition no. III.2 – ROP No. MI-ROP-N6996-2008b - The permittee shall not operate any equipment in FGFACILITY unless the malfunction abatement plan (MAP) for FGFACILITY, revised as necessary according to the procedures of Rule 911, is implemented and maintained. The MAP shall include procedures for maintaining and operating equipment in a satisfactory manner, including during malfunction events, and a program for corrective action for such events. If the MAP fails to address or inadequately addresses an event that meets the characteristics of a malfunction at the time the plan is initially developed, the owner or operator shall revise the MAP within 45 days after such an event occurs. The latest MAP for the facility was revised 8/5/2014. This MAP was approved by the AQD. Based upon operational reviewed during the inspection, the facility appears to be in compliance with this requirement and the requirements of the MAP.

Condition no. VI.2 - ROP No. MI-ROP-N6996-2008b - The permittee shall keep, in a satisfactory manner, records of monthly and 12-month rolling time period individual HAP and total HAP emission rate calculations for FGFACILITY, as required by SC I.1 and SC I.2. Based upon information provided by POET during the inspection (see attached), POET's 12-month rolling total HAP emissions through April 2015 were less than the 10/25 tpy limit.

Condition no. VII.4 - ROP No. MI-ROP-N6996-2008b - The permittee shall keep records of emissions and operating information to comply with the federal NSPS as specified in 40 CFR Part 60, Subparts A and VVa. Information required to be submitted to the Administrator shall be submitted to the AQD District Supervisor in an acceptable format within 30 days following the end of the semiannual period in which the data were collected. The latest Subpart VVa report (covering 7/1/14– 12/31/14) was received by the AQD on 1/12/15. According to the report, there were no devices with leaks that were not repaired.

EU FBCOOLER – Fluidized bed cooler

Condition no. V.1 - ROP No. MI-ROP-N6996-2008b - Verification of PM-10 and VOC emission rates from EUFBCOOLER by testing at owner's expense, in accordance with Department requirements, on or before six months of the ROP expiration date. Verification of emission rates includes the submittal of complete report of the test results. Testing was completed in January 2013, and the test report has been received by the AQD. AQD review of the report is complete, and the results were found to be acceptable.

Condition no. VI.1 - ROP No. MI-ROP-N6996-2008b - The permittee shall keep production records on a monthly basis and other records necessary to demonstrate compliance with the VOC emission rate limit. The VOC emission rate shall be calculated based upon monthly records prorated to an hourly rate. The ROP limits VOC emissions from EU FBCOOLER to 6.0 lbs/hr. According to emission calculations provided by POET during the inspection (see attached), VOC emissions rates for January 2014 through April 2015 were less than the 6.0 lb/hr limit.

Condition no. VI.2 - ROP No. MI-ROP-N6996-2008b - The permittee shall monitor the pressure drop of the baghouse on a weekly basis. Based upon operational data provided by POET during the inspection, the facility appears to be in compliance with this requirement and the operational parameter limit defined in the MAP.

EU DDGSSILO – Dried distillers grain and solubles silo

Condition no. III.1 - ROP No. MI-ROP-N6996-2008b - The permittee shall not operate EUDDGSSILO unless the fabric filter collector (CE009) is installed, maintained, and operated in a satisfactory manner. The pressure drop indicator associated with this fabric filter is at the top of the DDGS silo. Therefore, operations personnel do not climb to the top of the silo daily to read pressure drop. This device is not tied into their automated operational parameter monitoring system. The MAP requires a monthly pressure drop reading. POET does conduct daily fugitive emission observations (presumably non-certified) of the filter stack.

EU BOILER – Natural Gas Fired Boiler

Condition no. VI.1 - ROP No. MI-ROP-N6996-2008b - The permittee shall keep records of the natural gas consumed by EUBOILER on a daily basis. Based upon data provided by POET following the inspection (see attached), the facility appears to be in compliance with this requirement.

Condition no. VI.2 - ROP No. MI-ROP-N6996-2008b - The permittee shall maintain copies of utility bills indicating the receipt of natural gas from a supplier of commercial grade natural gas. Based upon data provided by POET following the inspection (see attached), the facility appears to be in compliance with this requirement.

FG CORN-DDGS – Corn and DDGS handling area

Condition nos. III.1 & VI.1 - ROP No. MI-ROP-N6996-2008b - The permittee shall not operate EUCORNELEV1 more than 16 hours per day. The permittee shall keep, in a satisfactory manner, records of the hours of operation of EUCORNELEV1 on a daily basis. Based upon data provided by POET following the inspection (see attached), the facility appears to be in compliance with this requirement.

Condition no. IX.1 - ROP No. MI-ROP-N6996-2008b - The permittee shall comply with all provisions of the federal Standards of Performance for New Stationary Sources as specified in 40 CFR Part 60 Subparts A and DD, as they apply to the equipment in FG-CORNDDGS. Per the requirements of NSPS Subpart DD, POET completed testing for FG-CORNDDGS in 2003 and the facility was found to be in compliance.

FGFERMENTERS – Fermentation and Distillation processes w/ packed bed scrubber

Condition no. V.1 – PTI 210-01E - Verification of VOC and Acetaldehyde emission rates from FGFERMENTERS by testing at owner's expense, in accordance with Department requirements, on or before six months of the ROP expiration date. Verification of emission rates includes the submittal of a complete report of the test results. Testing was completed in January 2013 and the test report has been received by the AQD. AQD review of the report is complete, and the facility appears to be in compliance with its emission limits.

Condition no. VI.1 – PTI 210-01E - The permittee shall monitor the scrubber liquid flow rate and exhaust temperature on a continuous basis during operation of FGFERMENTERS. Based upon operational data provided by POET following the inspection (see attached), the facility appears to be in compliance with this requirement and the operational parameter limit defined in the MAP.

Condition no. VI.2 – PTI 210-01E - The permittee shall keep production records on a monthly basis and other records necessary to demonstrate compliance with the VOC emission rate limit listed in SC I.1. The VOC emission rate shall be calculated based upon monthly records, prorated to an hourly rate. PTI 210-01E limits VOC emissions to 14.0 lbs/hr. According to the emissions calculation spreadsheet provided by POET following the inspection (see attached), the lb/hr VOC emissions for January through April 2015 was less than 14.0 lbs/hr.

FGDDGSDRYERS – Dryer and Centrifugation

Condition no. IV.1 – PTI 210-01E - The permittee shall not operate either dryer in FGDDGSDRYERS unless the associated multiclone (CE006 or CE007) is installed, maintained, and operated in a satisfactory manner. Satisfactory operation of each multiclone includes maintaining it according to the MAP. Based upon operational data provided by POET following the inspection (see attached), the facility appears to be in compliance with this requirement and the operational parameter limit defined in the MAP.

Condition no. IV.2 – PTI 210-01E - The permittee shall not feed materials to either dryer in FGDDGSDRYERS unless either the thermal oxidizer (CE010) or the regenerative thermal oxidizer (CE012) is installed, maintained, and operated in a satisfactory manner. Based upon operational data provided by POET following the inspection (see attached), the facility appears to be in compliance with this requirement and the operational parameter limit defined in the MAP.

Condition no. V.1 – PTI 210-01E - Verification of PM-10, VOC and NOx emission rates from FGDDGSDRYERS by testing at owner's expense, in accordance with Department requirements, on or before six months of the ROP expiration date. Testing was completed in January 2013 and the test report has been received by the AQD. AQD review of the report is complete, and the facility appears to be in compliance with its emission limits.

Condition no. VI.1 – PTI 210-01E - The permittee shall install, calibrate, maintain, and operate in a satisfactory manner a device to monitor and record on a continuous basis the minimum temperature to which exhaust gases from the dryers are exposed in the thermal oxidizer (CE010). Based upon operational data provided by POET following the inspection (see attached), the facility appears to be in compliance with this requirement and the operational parameter limit defined in the MAP.

Condition no. VI.2 – PTI 210-01E - The permittee shall install, calibrate, maintain, and operate in a satisfactory manner a device to monitor and record on a continuous basis the minimum temperature to which exhaust gases from the dryers are exposed in the regenerative thermal oxidizer (CE012). Based upon operational data provided by POET following the inspection (see attached), the facility appears to be in compliance with this requirement and the operational parameter limit defined in the MAP.

Condition no. VI.3 – PTI 210-01E - The permittee shall keep, in a satisfactory manner, continuous records of the minimum temperature to which exhaust gases from the dryers are exposed in the thermal oxidizer (CE010) and the regenerative thermal oxidizer (CE012). Based upon operational data provided by POET following the

inspection (see attached), the facility appears to be in compliance with this requirement and the operational parameter limit defined in the MAP.

Condition no. VI.4 – PTI 210-01E - The permittee shall keep monthly production records, monthly records of the ethanol content of distillation bottoms, and other records necessary to demonstrate compliance with the emission rate limit listed in SC I.4 from FGDDGSDRYERS. The emission rate shall be calculated based upon monthly records, prorated to an hourly rate. SC I.4 limits VOC emissions from the TO and RTO (combined) to 5.0 lbs/hr. Based upon data provided by POET following the inspection (see attached), the calculated lb/hr VOC emission rate through April 2015 was less than 5.0 lbs/hr.

Condition no. VI.5 – PTI 210-01E - The permittee shall keep monthly wet cake production records and other records necessary to demonstrate compliance with the emission rate limit listed in SC I.5 from EUCENTRIFUGE 1 to 5. The emission rate shall be calculated based upon monthly records, prorated to an hourly rate based on actual hours operated manufacturing wet cake.

Condition no. I.5 of PTI 210-01E limits VOC emissions from EUCENTRIFUGE1 to 5 to 2.0 lbs/hr combined (combined refers to stack 025 when producing wet cake and the TO&HRB and RTO are not operating). Based upon data provided by POET following the inspection (see attached), the calculated lb/hr VOC emission rate was less than 2.0 lbs/hr.

Condition no. VI.6 – PTI 210-01E - The permittee shall keep, in a satisfactory manner, records of the natural gas consumed by EUTO&HRB on a daily basis. Based upon data provided by POET following the inspection (see attached), the facility appears to be in compliance with this requirement.

Condition no. VI.7 – PTI 210-01E - The permittee shall conduct all required monitoring per the applicable CAM Plan and otherwise satisfy the requirements specified in 40 CFR 64.7 through 40 CFR 64.9. Based upon the results of the inspection and POET's MAP (which essentially contains the same monitoring for the TO, RTO and T-316 scrubber), the facility appears to be in compliance with the requirements of its CAM plan and CAM in general.

Condition no. VI.8 – PTI 210-01E - The permittee shall continuously monitor the temperature of the TO and RTO. Continuous shall be defined as sampling at least every 15 minutes. Based upon operational data provided by POET following the inspection (see below), the facility appears to be in compliance with this requirement and the operational parameter limits defined in the MAP.

Condition no. VI.9 – PTI 210-01E - An excursion is defined by any 3-hour block average where the temperature from the TO falls below 1480°F or the temperature from the RTO falls below 1650°F while materials are being fed into either dryer in FGDDGSDRYERS. Based upon operational data provided by POET following the inspection (see attached), the facility appears to be in compliance with this requirement and the operational parameter limits defined in the MAP. It's important to note that based upon the results of the January 2013 stack test, the minimum combustion chamber temperature for the TO was increased to 1500°F. This change is reflected in their most recent version of the MAP and the CAM plan.

Condition no. IX.1 – PTI 210-01E - The permittee shall maintain copies of utility bills indicating the receipt of natural gas from a supplier of commercial grade natural gas. Based upon information provided by POET following the inspection (see attached), the facility appears to be in compliance with this requirement.

FG ETHLOAD – Ethanol truck and rail load out

Condition no. VI.1 - ROP No. MI-ROP-N6996-2008b - The permittee shall keep, in a satisfactory manner, the following records for FGETHLOAD for each calendar month and for the rolling 12-month time period ending each calendar month.

- a. Throughput of denaturant and of denatured ethanol for FGETHLOAD. According to data provided following the inspection (see attached), the 12-month rolling total throughput of denaturant was 1,338,531 gal/yr in April 2015 (ROP limit is 5,000,000 gal/yr). The 12-month rolling total throughput of denatured ethanol was 59,778,880 gal/yr in April 2015 (ROP limit is 65,000,000 gal/yr).**
- b. Throughput of denatured ethanol for EUTRUCKLOAD3 and EUTRUCKLOAD4 combined while displaced vapor contents of the trucks being loaded are exhausted through SV014 or SV015. According to data provided following the inspection (see attached), the 12-month rolling total throughput of denatured ethanol “uncontrolled” was 762,839 gal/yr in April 2015 (ROP limit is 5,000,000 gal/yr).**
- c. Throughput of denatured ethanol for EURAILLOAD2 to receiving railcars that last transported denaturant. According to data provided following the inspection (see attached), the 12-month rolling total throughput of denatured ethanol was 0 gal/yr in April 2015. During the inspection, POET said they haven’t loaded a railcar in years.**
- d. Total of throughputs recorded for SC VI.1.b and SC VI.1.c. ROP limits throughput to 5,000,000 gal/yr. According to data provided following the inspection (see attached), the total 12-month rolling total throughput in April 2015 was 762,839 gal/yr.**
- e. Railcars receiving material through EURAILLOAD2 each month and which railcars have been certified as dedicated to transporting ethanol, including denatured ethanol. During the inspection, POET said they haven’t loaded a railcar in years.**

FG NSPSTANKS – Denaturant Storage, Natural Gas storage tanks T-802, T-805

Condition no. VI.1 - ROP No. MI-ROP-N6996-2008b - For each storage tank in FGNSPSTANKS, in accordance with the federal NSPS as specified in 40 CFR Part 60 Subparts A and Kb, the permittee shall do both of the following:

- a. keep records of inspections and operating information**
- b. report defects found during inspections**
- c. Notify the administrator in writing at least 30 days prior to filling or refilling of each storage tank (unplanned filling or refilling must notify administrator at least 7 days in advance)**

The permittee shall keep the records on file for a period of at least five years and make them available to the Department upon request. All defect reports required to be submitted to the Administrator shall be submitted to the District Supervisor, Air Quality Division, within 30 days of the inspection in which the defect was discovered. Based upon information provided by POET following the inspection (see attached), the facility appears to be in compliance with this requirement. The facility was not notifying the DEQ before filling and refilling the ethanol storage tanks. The facility keeps records of these events on site, in the future they will notify the Michigan DEQ at least 30 days prior to a planned filling/refilling event and at least 7 days prior to an unplanned event.

For each storage tank in FGETHANOLTANKS, the permittee shall keep a record of the tank's dimensions and an analysis showing the tank's capacity in accordance with the federal NSPS as specified in 40 CFR Part 60 Subparts A and Kb. The permittee shall keep each tank's record and analysis on file for the life of the tank and make the records and analyses available to the Department upon request. Based upon information provided by POET during the inspection, the facility appears to be in compliance with this requirement.

FG ETHANOLTANKS – Ethanol Storage Tanks

Condition no. VI.1 - ROP No. MI-ROP-N6996-2008b - The permittee shall keep, in a satisfactory manner, a continuing record of inspections of the floating roofs in EU190TANK, EU200TANK1 and EU200TANK2. The record shall include descriptions of the defects or malfunctions, if any, that were discovered during such inspections, and of the corrective action taken. Based upon information provided by POET following the inspection (see attached), the facility appears to be in compliance with this requirement.

FG ETHANOLTANKS is also subject to 40 CFR Part 60 Subparts A and Kb. This is not listed in the current ROP but will be added, the permittee shall do both of the following:

- a. keep records of tank inspections and operating information
- b. report defects found during inspections
- c. Notify the administrator in writing at least 30 days prior to filling or refilling of each storage tank (unplanned filling or refilling must notify administrator at least 7 days in advance)

The permittee shall keep the records on file for a period of at least five years and make them available to the Department upon request. All defect reports required to be submitted to the Administrator shall be submitted to the District Supervisor, Air Quality Division, within 30 days of the inspection in which the defect was discovered. Based upon information provided by POET following the inspection (see attached), the facility appears to be in compliance with this requirement. The facility was not notifying the DEQ before filling and refilling the ethanol storage tanks. The facility keeps records of these events on site, in the future they will notify the Michigan DEQ at least 30 days prior to a planned filling/refilling event and at least 7 days prior to an unplanned event.

The permittee shall not operate EU-DDGSSILO or any equipment in FG-FACILITY, FG-SCALP, FG-CORN-DDGS, FG-FLOUR, FG-FERMENTERS, or FG-DDGSDRYERS unless the associated control devices are installed, maintained and operated in a satisfactory manner. The following operating Parameters/Records were observed, These values and records appear to be in compliance with the ROP, MAP, and CAM plan.

Baghouse Number	Pressure Drop Indicator Range	Observed Range	Records Received	Compliance Status
F-829 Corn Leg Baghouse	0.3-6.0 in H2O	3.0	Yes	Compliance
F-840 Scalper Baghouse	0.3-6.0 in H2O	2.5	Yes	Compliance
F-682 Fluid Bed Baghouse	0.3-6.0 in H2O	0.6	Yes	Compliance
F-849/F-620 DDG Silo Baghouse/Flat Storage	0.3-6.0 in H2O	0.4	Yes	Compliance
F-110 Hammermill Baghouse	0.3-6.0 in H2O	2.0	Yes	Compliance
F-111 Hammermill Baghouse	0.3-6.0 in H2O	0.1	Yes	Compliance
F-112 Hammermill Baghouse	0.3-6.0 in H2O	1.8	Yes	Compliance
F-113 Hammermill Baghouse	0.3-6.0 in H2O	1.7	Yes	Compliance

Wet Scrubber	Inlet Flow Rate Range Water (Normal Operation)	Inlet Flow Rate Range Water after 36-hr shut down	Inlet Flow Rate Range SBS (Normal Operation)	Inlet Flow Rate Range SBS after 36-hr shut down	Pressure Drop Range	Scrubber Exhaust Temp Range
T-316 Wet Scrubber	30 Gallons per Min	15 Gallons per Min	20 Gallons per Min	SBS can be shut off	less than 15 in of H2O	less than 65 degrees F
Observed Range	48 GPM	NA	9.7 total	NA	8.1 (24 HR ave)	57.6 (24 hr ave)
	yes	yes	yes	yes	yes	yes

Records Reviewed						
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CYVM-615 Dryer A Cyclone System	Internal Dryer Hot Box Pressure Range	Pressure Drop Range
	-0.5- -2.0 in H2O	less than 10 inches H2O
Observed Range	-1.73	1.7
Records Reviewed	Yes	Yes

CYVM-615 Dryer B Cyclone System	Internal Dryer Hot Box Pressure Range	Pressure Drop Range
	-0.5- -2.0 in H2O	less than 10 inches H2O
Observed Range	-1.5	3.2
Records Reviewed	Yes	Yes

T.O.-701 Thermal Oxidizer	Chamber Temp Minimum Dryers up/not fed	Chamber Temp Minimum Dryers Fed	Acceptable Beer Stripper Bottom ethanol Percentage	Acceptable Combustion Air/Fuel Ratio
	800 Degrees F	1500 Degrees F	Less than 0.01%	Greater than 5.0
Observed Value	NA	1527	Test once a week .001%	5.55
Records Reviewed	Yes	Yes	Yes	Yes

K-675 Regenerative Thermal Oxidizer	Chamber 3-hr Temp Minimum	Exhaust Temp Minimum	Acceptable Beer Stripper Bottom ethanol Percentage
	<i>1650 Degrees F</i>	<i>at least 50 degrees F greater than inlet temp</i>	<i>Less than 0.01%</i>
Observed Value	1661	293	0.0005
Records Reviewed	Yes	Yes	Yes

CC: Gina McCann

NAME *S. J. [Signature]*

DATE 06/25/15

SUPERVISOR *C. [Signature]*