DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: On-site Inspection

B233164160

FACILITY: Michigan State University - Bioeconomy Institute		**SRN / ID:** B2331
LOCATION: 242 Howard Avenue, HOLLAND		**DISTRICT:** Grand Rapids
CITY: HOLLAND		**COUNTY:** OTTAWA
CONTACT: Amy L. Stevens , Environmental Engineer		**ACTIVITY DATE:** 08/23/2022
STAFF: Chris Robinson	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** SM OPT OUT
SUBJECT: FY '22 inspection to determine compliance status with respect to PTI no. 267-09A and any other applicable air quality rules and regulations.		
RESOLVED COMPLAINTS:		

I – Introduction

Chris Robinson (CR) from the Department of Environment, Great Lakes, and Energy's (EGLE) Air Quality Division (AQD) was on site to conduct an inspection of Michigan State University's Bioeconomy Institute facility (MSU, SRN B2331) on August 23, 2022. The facility is located at 242 Howard Avenue in Holland, Ottawa County, Michigan. Prior to entry CR surveyed the perimeter of the facility for odors and visible emissions. None were observed. Weather conditions were fair with a temperature of approximately 72°F and southerly winds at 3 mph (www.weatherunderground.com).

CR met with Tom Bauer, Environmental Compliance Officer, Doug Heemstra, Director, and Robert Bouwkamp, Engineering Manager for an initial meeting where they were informed of the purpose of the visit which was to conduct an inspection to determine compliance with Permit to Install PTI no. 267-09 and any other applicable air quality rules and regulations. Once the permit was discussed Tom Provided a walkthrough of the facility. Later, CR spoke with Amy Steven, Environmental Engineer, regarding records.

II - Facility Description

The facility is a pilot process research facility specializing in upscaling production of biofuels, agricultural and medical chemicals. The plant consists of (4) four buildings (Building 100, 200, 300, and 400). General plant operations are conducted in building 100 and building 400 is for lab space only. The equipment in the pilot plant includes reactors, distillation vessels, centrifuges, heat exchangers, mixers, vacuum pumps, pumps, scrubbers, and dust collectors.

III - Compliance Evaluation

MSU operates under PTI No. 267-09 and Rule 201 permit exemptions with Synthetic Minor Emission limits for EUPILOTPLANT to limit the Potential to Emit (PTE) to below Title V applicability thresholds. Although these limits were meant to keep the facility out of Title V, they do not limit the PTE for the entire facility. Therefore, the installation of additional emission units, exempt or permitted, could trip Title V applicability. Discussing this with Mr. Bauer, it was the facility's understanding that this PTI was a Title V Opt-Out permit, which it is not. With the restrictions in place the facility's PTE for VOCs are the emission limits established in Special Condition I.1-5 plus the exempt equipment discussed in Section 5 below. It is not clear if potential emissions are already at or exceed Title V for VOCs, which is 100 tpy or HAPs which are 10 tpy individual and 25 tpy combined. The facility should evaluate the PTE for the entire facility to ensure proper restrictions have been taken.

1) PTI No. 267-09A

EUPILOTPLANT

Per Special Conditions (SC) I.1-5 MSU's EUPILOTPLANT is subject to a Volatile Organic Compound (VOC) emission limit of 89 tons per year (tpy), a total Hazardous Air Pollutant (HAP) emission limit of 22.4 tpy, an individual HAP emission limit of 8.9 tpy, a 10 Micron Particulate Matter (PM10) emission limit of 13.4 tpy and a Total Particulate Matter (PM) emission limit of 0.01 lb. per 1,000 lbs. of exhaust gas. With the exception of PM, the emission limits are based on a 12-month rolling time period. The PM limit is an instantaneous limit for which compliance is demonstrated by properly maintaining and operating the baghouses. A Malfunction Abatement Plan (MAP) was provided and MSU appears to be following it. The baghouses were not operating at the time of this inspection; however, checklists were nearby and have been completed regularly and visual observations seem to indicate that the units were being properly maintained. Therefore, MSU appears to be meeting the PM limit.

Emission records were provided for the time period of August 2021 through July 2022. The maximum calculated emissions emitted during that period were 891.97 pounds of VOC (December 2021), 300.4 pounds of total HAPS (April 2022), and 324.9 pounds of PM10 (July 2022). MSU appears to be in compliance with these emission limits as well as the individual HAP limit since the maximum total HAP emissions were less than 8.9 tpy.

MSU is subject to additional emission limits specified in SC I.6 through I.69 which were established to allow for some material use flexibility. Pollutant categories were established based on Toxic Air Contaminant (TAC) screening levels for both VOC's and PM:

VOC Compounds

Category 1 pollutants are all VOC compounds with a screening level of 0.0002 to < 0.001,
Category 2 pollutants - 0.001 to <0.01,
Category 3 pollutants – 0.01 to <0.1,
Category 4 pollutants – 0.1 to <1,
Category 5 pollutants – 1 to <10,
Category 6 pollutants – 10 to <100,
Category 7 pollutants – 100 to <1000
Category 8 pollutants – 1000 and above.

Particulate Compounds

Category 11 pollutants are all particulate compounds with a screening level of 0.0002 to < 0.001,
Category 12 pollutants 001 - 0. to <0.01,
Category 13 pollutants – 0.01 to <0.1,
Category 14 pollutants – 0.1 to <1,
Category 15 pollutants – 1 to <10,
Category 16 pollutants – 10 to <100,
Category 17 pollutants – 100 to <1000
Category 18 pollutants – 1000 and above.

Special Conditions I.14-I.37 (Scrubber) and I.46-I.69 (Baghouse) are based on "Test Protocol". Compliance with these limits is demonstrated through proper operation and maintenance of the

scrubber and Baghouse as required by SC IV.1 and SC IV.2. MSU appears to be properly operating and maintaining the scrubbers and baghouses, as noted below.

The emission limits specified in SC I.6-I.13 and I.38-I.45 are based on a 12-month rolling time period. Emission records for all of 2021 and 2022, through July, were provided. However, the facility is not updating them as frequently as required by the permit. CR informed the facility that records are required to be completed by the 15th of each month for the previous month, which the facility will do going forward. A summary table of the screening level-based emission limits along with the calculated emissions data provided is below and appears to demonstrate compliance.

Amy and CR discussed the rolling 12-month time period requirement and there was some confusion as to whether this is an average or total. The rolling 12-month calculation should be a total not an average as noted in Footnote 2 for both PM and VOCs.

Pollutant Type	Pollutant Category No.	Screening Level* Range	Limit+ (pph)	Time Period / Operating Scenario	Facility Calculated MAX Emissions January 2021 – July 2022
Scrubber VOCs	1	0.0002 to <0.001	8.21×10^{-6}	12-month rolling time period**	Not used
	2	0.001 - <0.01	4.10×10^{-5}		Not used
	3	0.01 to <0.1	4.10×10^{-4}		Not used
	4	0.1 to <1	4.10×10^{-3} (0.00410)		0.0009
	5	1 to <10	4.10×10^{-2} (0.0410)		< 0.00
	6	10 to <100	0.41		0.001
	7	100 to <1000	4.1		0.006
	8	1000 and above	41.0		0.008
Baghouse PM	11	0.0002 to <0.001	1.55×10^{-5}		Not used
	12	0.001 to <0.01	7.74×10^{-5}		Not Used
	13	0.01 to <0.1	7.74×10^{-4}		Not Used
	14	0.1 to <1	7.74×10^{-3}		0.0019
	15	1 to <10	7.74×10^{-2}		Not Used
	16	10 to <100	0.774		0.01
	17	100 to <1000	7.74		Not Used
	18	1000 and above	77.4		Not Used

Scrubbers SR-001, SR-002, SR-003 and baghouses EF-1, EF-3, DU-366A, and DU-366B are installed, operated, and maintained in a satisfactory manner. The baghouses are equipped with pressure differential gauges and the scrubbers are equipped with liquid flow rate indicators. None of the baghouses were operating and two of the three scrubbers were operating. The gauge on SR-001 was pegged out, but responding to flow adjustments, and the gauge for SR-003 was reading 16 gpm. Records required by SC VI1-5 were provided. Stack height and diameter requirements were not verified but did appear accurate and Mr. Bauer indicated that no changes have been made since they were installed.

2) Miscellaneous

MSU operates three boilers. Two are 16,329,000 BTU natural gas fired Cleaver Brooks units and the third is a 3,456,000 BTU natural gas fired only Parker Boiler Company unit. All three appear to be exempt from Rule 201 permitting requirements per Rule 282(2)(b)(i) for being less than 50,000,000 BTUs and using sweet gas. The two Cleaver Brooks boilers are subject to the Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units promulgated in 40 CFR Part 60, Subpart Dc since they were installed after 1984 and have a maximum heat input capacity of greater than or equal to 10,000,000 Btus. This requires the facility to submit an Initial Notification and track fuel usage. Fuel is being tracked and the Initial Notification was sent to the AQD on September 19, 2008.

Some metal cutting equipment was observed in the maintenance department. This equipment appears exempt from Rule 201 permitting requirement per rule 285(2)(l)(vi)(B) since any emissions associated to them are released to the in-plant environment.

3) MAERS

Emissions for calendar year 2021 was submitted on time (March 24, 2022) by the facility and reviewed by AQD on May 17, 2022. No changes to the database as submitted. A summary of the 2021 emissions data is below.

Pollutant	Amount (Tons)
AMMONIA	0.07
CO	1.74
LEAD	0.00001
NOX	2.08
PM10, PRIMARY	0.43
PM2.5, PRIMRY	0.16
SO2	0.01
VOC	0.53

IV - Compliance Determination

Based on the observations and discussions made during the inspection and a subsequent records review MSU appears to be operating in compliance with PTI No. 267-09A and other applicable air quality rules and regulations.

NAME _____ DATE 9/21/22 SUPERVISOR _____