

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

P102856557

FACILITY: Corteva LLC		SRN / ID: P1028
LOCATION: 701 Washington Street, MIDLAND		DISTRICT: Bay City
CITY: MIDLAND		COUNTY: MIDLAND
CONTACT: Patty Worden , Senior Environmental Specialist		ACTIVITY DATE: 11/24/2020
STAFF: Kathy Brewer	COMPLIANCE STATUS: Non Compliance	
SUBJECT: EU12b Use of permitted venting hours to carbon bed system exceeded by 4.4 hours due to unanticipated use during May 2020 500 year flood event. No VN sent. Facility also received approval for PTI 108-19A on Feb 5, 202 that allowed increase in carbon bed use hours.		SOURCE CLASS: MEGASITE
RESOLVED COMPLAINTS:		

SRN P1028 EU12b 11-24-2021 Inspection

Corteva contact: Patty Worden

The EU12b is a 2,4-D process herbicide manufacturing plant. Equipment includes reactors, distillation/fractionation columns, separators, storage tanks/silos and related equipment. Manufacturing equipment is located in 948 Building. The facility may operate up to 365 days per year and 24 hours per day.

EU12b is subject to the requirements of 40 CFR part 63 subpart EEEE - Organic liquid distribution ("OLD" MACT) and Subpart MMM Pesticide active ingredient (PAIP MACT) and equipment leak provisions of Subpart H (National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks)

This emission unit was most recently permitted in PTI 108-19A on February 5, 2021.

A pre-inspection overview was provided on October 29, 2020 that covered the process flow diagram, vent locations, control devices and review of emission calculations. During the November 24, 2020 on site visit the ROP required emission control and metering devices, vents, and real time process screens were viewed. On site records were provided for VOC emissions, carbon bed usage, process and control device vent status and operating parameters.

The facility was in noncompliance with operational restriction SC III. 3 at the time of the inspection. No VN will be sent because the noncompliance was related to the 500 year flood event in May 2020.

On Site Records Review**963 THROX**

- Vent status
- Vent Status to carbon beds
- Temperature
- pH

Carbon bed adsorber

- 12 month rolling 2019 and 2020 venting hours
- Individual carbon bed usage

Caustic scrubber

- VA-1011 flow
- T-1010 flow

AQD File Review**MAERS 2020 emissions**

CAM reports March 2020, September 2020, March 2021

ROP Semi annual Deviation reports March 2020, September 2020, March 2021

MACT Reports Subpart PAI Sept 2019, March 2020, Sept 2020.

Permit EVAL forms for PTI 84-14, 108-19, 108-19A

PTI application 108-19 and 108-19A

Description

The 2,4-D process consists of a batch reaction followed by several processing units to isolate and purify the product 2,4-D acid. Ancillary equipment includes a purification unit for water and acidification extraction streams for reuse and a treatment system for process generated brine stream.

Process vents are treated by a caustic scrubber system consisting of VS-1011 and T-1010, a two-stage scrubber system consisting of a venturi scrubber and a packed tower scrubber in series. The caustic scrubber system is part of a device train that typically vents to the 963 THROX (SRN P1027). When the 963 THROX is not available, VS-1011/T-1010 is used to comply with HCl/Cl₂ emission requirements of the PAIP MACT which then vents to the 948 carbon adsorber system. The carbon adsorber system (V-1020, V-1021, V-1022) is used for OHAP control. The 948 carbon adsorber system is also used as a backup control device for the 2,4-D salt herbicide process located in 959 Building (EU03).

At the time of the inspection venting to the carbon absorber was limited to 480 hours per year. A PTI application was received on November 9, 2020 and approved on February 5, 2021 that allowed an increase in the maximum venting to the carbon system up to 744 hours.

Emissions

SC I.1, VI.3 VOC emission – limit 10 lb/yr

Month	Total VOCs (lb/month)	12 Month Rolling (lbs/yr)
May 2019	1.10	2.94
January 2020	0.25	4.30
August 2020	0.25	4.74

VOC emissions are calculated using maximum rate from PTI application for each emission generating activity, not actual process emissions. The maximum rate is based on prior vent sampling of the carbon bed and an assumed venting of 365 days per year to the 963 TTU. Pre-control maximum average vent rate assuming 24/7 venting is used then a 963 TTU 99.9% control efficiency is applied for the period venting to the 963 TTU. A 98% control efficiency is applied for the period venting to the carbon bed. Total VOCs per month include VOCs vented to 963 TTU and VOCs to carbon bed.

Chemical	Carbon bed	963 TTU
	PER lb/yr	PER lb/yr
	(max 20 days venting)	(365 days venting)
perc	243	291
MeCl ₂	1.16	1.38
chloroform	0.61	0.73
phenol	0.26	0.31
p-chlorophenol	0.05	0.06
2,6 dichlorophenol	0.34	0.41
2,4D	0.00009	0.00010
perc impurities	1.22	1.45
Total VOCs lb/year	2.48	2.96

Carbon bed (98% removal)

243 lb/year perc = 25.3 lb/hr perc pre-control from process (out of E-1002) x (1-98/100) x 24 hrs/day x 20 days venting/year

963 TTU (99.9% removal)

Perc lbs/year vented from process (through E-1002) = 25.3247 lb/hr x 24 x 365 = 221,844 lb/year

Perc Lbs/year vented to TTU = 221,844 from process + 256 from Perc offload + 68,881 from scrubber neutralization = 290,982 lbs perc/year

290,982 lb/year x (1-99.9/100) = 291 lbs perc/year out of the TTU

January 2020 emission calculations were reviewed in detail.

Material limits

The ROP does not list any specified material limits.

Process/Operational limits

SC III.1 requires replacement of the carbon in the carbon absorber system to maintain 98% control efficiency. The carbon bed system has three individual vessels that are changed out after each vessel is used for 24 hours. A counter within the process control system tracks the time that each individual carbon bed is in use. A daily counter tracks the time each day that the vent bypass the TTU and go to the carbon beds. These all count based on valve positions. A screen shot of the carbon bed use hours and each valve position to the carbon bed at the time of the inspection is attached. Records showing October 22, 2020 carbon bed change out for V-1020 and V-1022 are also attached. Records review indicate the facility was in compliance with this requirement.

SC III.2 prohibits the unloading of perchloroethylene from any tank truck unless the 963 TTU is installed, maintained, and operated in a satisfactory manner. Satisfactory operation of the THROX shall be determined according to the requirements of FG963THROX and FGPESTICIDES of Renewable Operating Permit No. MI-ROP-TBD-2017c (or any subsequent revision). During the inspection the perchloroethylene transfer area was viewed. Records of 963 TTU operating hours and vent valve position are attached. Records review indicate the facility was in compliance with this requirement.

SC III.3 limits the exhausting of designated process vents in EU12b to the carbon adsorber system for no more than 480 hours (20 days) per 12-month rolling time period as determined at the end of each calendar month.

Month	963 TTU bypass days/month	12 Month Rolling
May 2019	7.29	11.1
January 2020	0	11.5
August 2020	0	15.3

On October 26, 2020 Corteva notified EGLE that EU12b had exceeded the 480 hours allowed for venting to the carbon beds by 4.4 hours on October 23, 2020. The EU12b VOC limit had not been exceeded.

The annual usage of the carbon beds is approximately 16-18 days per year. On May 19, 2020 the Midland site experienced a 500 year flood event and the site was evacuated. In preparation for the evacuation, 948 took the following actions:

- All equipment was placed in a safe state.
- Inlet and outlet valves to all process vessels were closed for all vessels that have valves on the vent line. Some vessels run at atmospheric pressure and do not have automated valves on the vent line and they remained open to the vent header.
- A N2 pad was placed on certain vessels.
- All pumps were turned off.
- All vent header purges were turned off.
- The MOD process control system was shut down in anticipation of potential power outage.

The process control system was not brought back online until May 23rd so the process was open to the carbon bed for 138 hours during this unanticipated event. During this time frame, emissions were minimal due to the above actions taken.

Design and Equipment Parameters

SC IV.1 requires the caustic scrubber system to have flow indication devices. SC IV.2 requires proper operation of the caustic scrubber when EU12b operations emit from indicted process vents. The flow metering devices were viewed while on site. Operating parameters were reviewed to evaluate compliance with required design and equipment parameter. Screen shots from historical operating records and from the day of the on site inspection are attached.

Date	VS-1011 gpm flow	T-1010 gpm flow
	11 AM (AI 680 D)	11 AM (AI 600 D)

May 6 2019	99.9		17.9	
January 13 2020	110.17		17.9	
August 2 2020	99.67		18.06	
November 24, 2020	In field	IP 21	In field	IP 21
	99.2	99.86	17.9	17.9

Instrument calibration information and records from September 2020 were reviewed and are attached.

SC IV.3 requires the 963 THROX to be installed, maintained and operated in a satisfactory manner. Satisfactory operation of 963 THROX is determined in FG963THROX (SRN P1027) and FGPESTICIDES.

Date	EU12b vent status to carbon 11 AM (DI-002A)	Throx temp 11 AM (AI 368)	Throx pH 11 AM (AI 365)
May 6 2019	open	791.2	9.13
January 13 2020	closed	816	9.3
August 2 2020	closed	843	9
November 24, 2020	closed	787	9.6

Operating parameters were reviewed to evaluate compliance with required design and equipment parameter. Screen shots from historical operating records and from the day of the on site inspection are attached.

Testing/Sampling

The ROP does not list any specified testing or sampling.

Monitoring and Recordkeeping

SC VI.1. The facility monitored and recorded continuous flow monitoring for the caustic scrubber (VS-1011/T-1010) as required by the ROP and appears to be in compliance with PAI MACT monitoring and record keeping requirements.

SC VI.2. The facility monitored and recorded on a continuous basis the flow at the bypass line (Vent valve DO 001 A to 963 TTU and bypass to carbon beds vent valve DO 002 B) as required by the ROP.

SC VI.3. The facility calculated VOC emissions monthly as required by the ROP.

SC VI.4 The facility monitored and recorded the hours that process vents from EU12b exhausted to the carbon absorber as required by the ROP.

Stack/Vent Restrictions

The following vent information was confirmed during the inspection.

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Description
1. SV12005	4 ²	20 ²	carbon system atmospheric vent

The following vents were included in the PTI 108-19A PTI application

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Description
FG963TTU	18	80	963 TTU owned by DDP (SRN P1027)
SV12001	NA	NA	V-102 NaOH Storage tank (R284 (h) exempt)
SV12002	NA	NA	V-4203 DT-4000 (R284(h) exempt)
SV12003	NA	NA	V-903A Brine tank (R284(c) exempt)
SV12004	NA	NA	V-903B Brine tank (R284(h) exempt)

Annual and Semi annual Deviation report review:

Mar 2021 1st half

EU12b During period of site evacuation due to 500 yr flood, seven vessels had unplanned venting to non monitored or operation VS-1011/T-101scrubber and bypassed control device for 95 hours w/worse case scenario emissions of 39.3 lbs Perchloroethylene, 0.19 lbs Methylene chloride, 0.098 lbs Chloroform, 0.0007 lbs 20chloro phenol, and 8.5E-05 lbs Phenol. Control system put back in operation when staff allowed back on site and control valve replaced with "fail closed" valve. EU13, EU02, EU01, EU12b and R290 bldg. 477 PAI MACT relief devices not monitored after process shutdown and site evacuation due to 500 yr flood. No evidence of relief device activation during period. PAI

MACT Group 1 IR monitoring of relief devices in >5% OHAP service not monitored May - June due to contractor restrictions on site access during COVID-19. July - Aug monitoring found no leaks.

2nd half EU12b vented to PAI MACT back up carbon back-up control 484.4 hours in 12 months, above permitted 480 hours. May 2020 500 year flood resulted in unplanned usage of 138 hours when 963 TTU offline. PTI submitted to increase usage of carbon allowed to 744 hours. Carbon bed change out occurred every 24 hours as normal and VOC 10 lb per 12 month limit met.

Mar 2020 Semi 1

EU12b: Vent tie in location incorrect. PTI app submitted 6/24/2019 and PTI issued 12/18/2019 based on correct vent configuration. MACT Control device not used, Air permit emission limits were not exceeded:

Semi 2

EU12b: Vent tie in location incorrect. PTI app submitted and PTI issued based on correct vent configuration.

PAI MACT- EU12b pump in >5%HAP service not in LDAR program, barrier fluid so exempted from quarterly monitoring. No leaks in logbook review 2018/2019

PTI 108-19A application review noted the following regarding applicable Federal Regulations

40 CFR 63 Subpart MMM - NESHAP for Pesticide Active Ingredient Production

This standard applies to process units that manufacture pesticide active ingredients. The ROP includes this standard's requirements through the flexible group FGPESTICIDES. USEPA has promulgated a Section 112(f) review (residual risk review) for Subpart MMM.

40 CFR 63 Subpart EEEE - NESHAP for Organic Liquids Distribution

This standard applies to emissions of organic HAPs from distribution of organic liquids other than gasoline. The ROP includes this standard's requirements through the flexible group FGOLDMACT.

40 CFR 63 Subpart H - NESHAP for Organic HAPs Equipment Leaks

This standard applies to fugitive emissions of organic HAPs from leaking components and other equipment. The ROP includes this standard's requirements through the flexible group FGONFUGITIVES.

USEPA has promulgated a residual risk review for 40 CFR Part 63 Subpart MMM, to which EU12b is subject, all HAP emissions from EU12b are excluded from Rule 225 review. This exclusion means emissions of HCl and several other TACs emitted from the process are excluded from the Rule 225 review. The following TACs are subject to Rule 225:

- "perc impurities"
- 2,6-dichlorophenol
- para-chlorophenol



NAME _____

DATE 8/11/2021

SUPERVISOR 