

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

A404362721

FACILITY: Dow Silicones Corporation		SRN / ID: A4043
LOCATION: 3901 S Saginaw Rd, MIDLAND		DISTRICT: Bay City
CITY: MIDLAND		COUNTY: MIDLAND
CONTACT: Amanda Karapas , Air Specialist		ACTIVITY DATE: 04/28/2022
STAFF: Gina McCann	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MEGASITE
SUBJECT: EU321-01, EU321-02, and EU321-11		
RESOLVED COMPLAINTS:		

Dow Silicones/EGLE-AQD staff present during the inspection:

- Gina McCann (EGLE-AQD, Environmental Quality Specialist)
- Amanda Karapas (Dow Air Specialist)
- Amy Chang (Dow Environmental Specialist)
- Steven Rausch (Production Engineer)

EU321-01

This emission unit is a 40x resin process that includes a reaction loop, capping reactor, 3 separators, 2 columns, and ancillary equipment. Emissions from neutralization activities can vent to FGTHROX or FGSITESCRUBBERS. During FGTHROX downtime, Scrubbers 7170, 4776, and 11472 will continue to achieve Group 1 control for HCl. The process does not release emissions through SV321-001, SV321-019, SV321-021, or SV321-069 during normal operations. This emission unit is subject to the miscellaneous chemical manufacturing NESHAP in 40 CFR Part 63, Subparts A and FFFF. The most recent PTI for this emission unit is PTI No. 174-12B.

Emissions are controlled by several control devices; condenser (24623), venturi scrubbers (11472, 7170, 4776), scrubber 7159, and the activated carbon bed. Tank 4755 vents ammonia emissions to venturi scrubber 11472 which is followed by scrubber 7170 and scrubber 4776. The emissions vent path continues to either FGTHROX or FGSITESCRUBBERS as an alternative backup to FGTHROX. Emissions from reactor tank 24622 are controlled by condenser 24623. Quench tank 5112 is used for off spec material and is neutralized with ammonia. Ammonia emissions vent to scrubber 7159 and then follow the vent path to scrubber 7170 and 4776 scrubber. Emissions from breathing loss on the final product bulk tanks vent to the activated carbon bed.

VOC emissions are restricted to 2.5 ton per year (tpy) based on a 12-month rolling time period as determined at the end of each month, per special condition (SC) I.1. SC VI.5. is the associated monitoring and recordkeeping requirement that requires the plant to calculate and keep, in a satisfactory manner, records of monthly and 12-month rolling time period VOC emissions for EU321-01 using production records, operating records, and/or other data acceptable to the AQD District Supervisor. For the 12-month rolling time period ending February 2022, VOC emission were 1.29 tpy.

To ensure emissions are efficiently captured each of the control devices has a specific operating range it shall operate within to be in compliance. SC III.1. restricts operation of the equipment in EU321-01 that exhausts to condenser 24623 unless the

coolant return temperature of the condenser is 40°C or less. SC VI.2. is the associated monitoring and recordkeeping requirement that requires the plant to monitor and record, on a continuous basis, the coolant return temperature of condenser 24623 with instrumentation acceptable to the AQD. For the purpose of this condition, "on a continuous basis" is defined as an instantaneous data point recorded at least once every 15 minutes. The permittee may record block average values for 15 minutes or shorter periods calculated from all measured data values during each period. I reviewed the time period starting August 1, 2021 through April 1, 2022 and the condenser operated below 40°C or less during this time period.

SC III.2. restricts operation of the equipment in EU321-01 that exhausts to scrubber 11472 unless the scrubber liquid flow rate is 4.2 gallon per minute (gpm), except during periods of planned routine maintenance for the scrubber. Planned routine maintenance shall not exceed 240 hours per year. During the timeframe January 2021 through April 2022, no maintenance occurred on the scrubber while the process was in operation. SC VI.3. is the associated monitoring and recordkeeping requirement that requires the plant to monitor and record, on a continuous basis, the liquid flow rate of each scrubber with instrumentation acceptable to the AQD. For the purpose of this condition, "on a continuous basis" is defined as an instantaneous data point recorded at least once every 15 minutes. The permittee may record block average values for 15 minutes or shorter periods calculated from all measured data values during each period. SC VI.6. is the associated monitoring and recordkeeping requirement that requires the plant to keep a record of the number of hours per month and per year that planned routine maintenance occurs for scrubber 11472 while material is stored in storage tank DV4755. I reviewed scrubber liquid flow rates for the time period August 1, 2021 through April 1, 2022. The scrubber had a liquid flow rate greater than 4.2 gpm except during the timeframe September 12, 2021 through October 4, 2021. Further review of the data provided showed the tank level associated with this timeframe was empty. The number of hours that maintenance was performed while the scrubber was in operation was zero hours for the timeframe January 2021 through April 2022.

SC III.3. restricts operation of the equipment in EU321-01 that exhausts to scrubber 7170 unless the scrubber liquid flow rate is 4.8 gpm or more. SC VI.3. is the associated monitoring and recordkeeping requirement that requires the plant to monitor and record, on a continuous basis, the liquid flow rate of each scrubber with instrumentation acceptable to the AQD. For the purpose of this condition, "on a continuous basis" is defined as an instantaneous data point recorded at least once every 15 minutes. The permittee may record block average values for 15 minutes or shorter periods calculated from all measured data values during each period. I reviewed liquid flow rates for scrubber 7170 for the time period starting August 27, 2021 through April 25, 2022. The liquid flow rate for scrubber 7170 was greater than 4.8 gpm during this time period.

SC III.4. restricts operation of the equipment in EU321-01 that exhausts to scrubber 4776 unless the scrubber liquid flow rate is 1.9 gpm or more. SC VI.3. is the associated monitoring and recordkeeping requirement that requires the plant to monitor and record, on a continuous basis, the liquid flow rate of each scrubber with instrumentation acceptable to the AQD. For the purpose of this condition, "on a continuous basis" is defined as an instantaneous data point recorded at least once every 15 minutes. The permittee may record block average values for 15 minutes or

shorter periods calculated from all measured data values during each period. I reviewed liquid flow rates for scrubber 4776 for the time period starting August 1, 2021 through April 1, 2022. The scrubber had a greater flow than 1.9 gpm during this time period except from September 8, 2021 through September 30, 2021. Further review of the data provided showed the process was not in operation during this timeframe, which lines up with plant wide maintenance.

SC III.6. restricts operation of equipment in EU321-01 that exhausts to scrubber 7159 unless the liquid flow rate is 5.2 gpm or more. SC VI.3. is the associated monitoring and recordkeeping requirement that requires the plant to monitor and record, on a continuous basis, the liquid flow rate of each scrubber with instrumentation acceptable to the AQD. For the purpose of this condition, "on a continuous basis" is defined as an instantaneous data point recorded at least once every 15 minutes. The permittee may record block average values for 15 minutes or shorter periods calculated from all measured data values during each period. I reviewed liquid flow rates for scrubber 7159 for the time period starting August 1, 2021 through April 1, 2022. The scrubber had a greater flow than 5.2 gpm during this time period except from September 14, 2021 through September 30, 2021. Further review of the data provided showed the process was not in operation during this timeframe, which lines up with plant wide maintenance.

SC III.7 restricts operation of the equipment in EU321-01 that exhausts to the activated carbon bed unless the first tote of activated carbon bed is replaced whenever the second tote's weight increases by 175 pounds and the second tote becomes the first tote. SC VI.4. is the associated monitoring and record keeping requirement that requires the plant to monitor and record, on a continuous basis, the weight of each activated carbon tote with instrumentation acceptable to the AQD. For the purpose of this condition, "on a continuous basis" is defined as an instantaneous data point recorded at least once every 15 minutes. The permittee may record block average values for 15 minute or shorter periods calculated from all measured data values during each period. I reviewed weight increases of the second tote for the time period starting January 1, 2021 through April 26, 2022. The secondary carbon tote did not exceed 175 lbs. during this timeframe. During the walk through of the control room and equipment, I spoke to the operator and the alarm set point is associated with the primary carbon tote. When the primary carbon tote exceeds 175 lbs. the plant replaces the tote. The plant is conservatively replacing these totes.

Table 1 shows the operating parameters observed during the inspection.

Table 1			
Pollution Control Device	Process/Operational Restriction	Value Observed	Secure Process Alarm (SPA)
Condenser (24623)	coolant return temperature of the condenser is 40°C (104F) or less	24.0 C	38 C

Scrubber 11472	liquid flow rate is 4.2 gallons per minute or more	4.6 gpm	4.2 gpm
Scrubber 7170	liquid flow rate is 4.8 gallons per minute or more	5.6 gpm	4.8 gpm
Scrubber 4776	liquid flow rate is 1.9 gallons per minute or more	3.3 gpm	1.9 gpm
Scrubber 7159	liquid flow rate is 5.2 gallons per minute or more	7.5 gpm	5.2 gpm
Activated carbon bed Primary tote	second tote's weight increases by 175 pounds	47.4 kgs.	80.3 kgs. On primary tote
Activated carbon bed Secondary Tote	second tote's weight increases by 175 pounds or 80.3 kg.s	20.8 kgs.	

SC III.8. restricts operation of equipment in EU321-01 that exhausts to FGTHROX or FGSITESCUBBERS unless FGTHROX or FGSITESCUBBERS are operated in accordance with their associated requirements. The last inspection of FGTHROX was July 14, 2021. During this inspection, FGTHROX was in compliance with the conditions associated with it. Likewise, FGSITESCUBBERS, was last inspected October 17, 2019. FGSITESCUBBERS were found to be operating in a satisfactory manner when accepting exhaust from EU321-01.

To determine the accuracy of the data reviewed we require the plant calibrates parameter indicators at an appropriate frequency. SC IV.7. requires the plant to calibrate the coolant return temperature indicator of condenser 24623. SC IV.8 requires the liquid flow rate indicators for each of the scrubbers (7170, 4776, 7159) is calibrated. SC VI.9. requires the activated carbon bed scales are maintained and calibrated. Table 2 shows the frequency of these calibrations are occurring at least every four years or more frequently.

Table 2		
	Date 1	Date 2

Control Device		
7170	3/24/2022	6/27/2020
24623	9/28/2020	8/8/2016
5141	12/13/2021	12/28/2019
7158	2/26/2022	3/28/2020
4776	4/16/2021	3/30/2017
N Carbon Scale	3/30/2021	3/30/2020
S Carbon Scale	2/29/2022	2/10/2021

Compliance Reporting

EU321-01 had two deviations reported in the 2021 Annual ROP deviation report. One was associated with the LDAR program. It was discovered that two dual mechanical seal pumps were being inspected weekly, but the inspection checklist did not include the required seal fluid drip rate. Pumps were found to be leak free. To prevent recurrence, the site fugitive emissions database was updated to ensure these pumps follow the single mechanical seal pump requirements for routine monitoring which will eliminate the weekly visual inspection.

The other reported deviation was for the vent stack SV321-005 being at a lower height than what is required by the permit. PTI174-12B resolved this deviation.

EU321-02

This emission unit is a capped resin manufacturing process including jacketed reactors, process condensers, a receiver, and auxiliary equipment. During FGTHROX downtime, Group 1 MON processes are shut down. Non-Group 1 processes may continue to operate and vent locally or to FGSITESCUBBERS. This EU is subject to the requirements of 40 CFR Part 63, Subparts FFFF and UU. The most recent PTI for this emission unit is PTI No. 176-20.

Emissions are controlled by several control devices; venturi scrubbers 7170 and 4776, which are shared with EU321-01, and scrubber 7158.

SC I.1. restricts VOC emissions to 0.56 tpy. SC VI.3. is the associated monitoring and recordkeeping requirement that requires the calculate and keep, in a satisfactory manner, records of monthly and 12-month rolling time period VOC emissions for

EU321-02 using production records, operating records, and/or other data acceptable to the AQD District Supervisor. For the 12-month rolling time period ending February 2022, VOC emissions were 0.19 tpy.

SC III.1. restricts operation of the equipment in EU321-02 that exhausts to scrubber 7158 unless the scrubber liquid flow rate is 3 gpm or more. SC VI. 2. Is the associated monitoring and recordkeeping requirement that requires the plant to monitor and record, on a continuous basis, the liquid flow rate of each scrubber (7158, 7170, 4776) with instrumentation acceptable to the AQD. For the purpose of this condition, "on a continuous basis" is defined as an instantaneous data point recorded at least once every 15 minutes. The permittee may record block average values for 15 minute or shorter periods calculated from all measured data values during each period. I reviewed liquid flow rates for scrubber 7158 for the time period August 1, 2021 through April 25, 2022. The scrubber operated at 3.0 gpm or more during this time period.

Table 3 shows the operating parameters observed during the inspection.

Table 3			
Pollution Control Device	Process/Operational Restriction	Value Observed	Secure Process Alarm (SPA)
Scrubber 7170	liquid flow rate is 4.8 gallons per minute or more	5.6 gpm	4.8 gpm
Scrubber 4776	liquid flow rate is 1.9 gallons per minute or more	3.3 gpm	1.9 gpm
Scrubber 7158	liquid flow rate is 3.0 gallons per minute or more	3.3 gpm	3.0 gpm

Discussions regarding compliance of scrubbers 7170 and 4776 can be found under the EU321-01 heading.

SC III.5 restricts EU321-02 from exhausting any equipment through scrubber 11476. During the inspection we viewed the physical position of this valve in the field and it was not open and able to receive exhaust from EU321-02.

To determine the accuracy of the data reviewed we require the plant calibrates parameter indicators at an appropriate frequency. SC IV.5. requires the plant to calibrate the liquid flow rate indicators for each of the scrubbers (7170, 4776, 7158) is calibrated. Table 4 shows the frequency of these calibrations are occurring at least every four years or more frequently.

Table 4		
Control Device	Date 1	Date 2
7170	3/24/2022	6/27/2020
7158	2/26/2022	3/28/2020
4776	4/16/2021	3/30/2017

Compliance Reporting

EU321-02 did not report deviations in the 2021 Annual ROP deviation report.

EU321-11

This emission unit is a capped resin manufacturing process including jacketed reactors, process condensers, a receiver, and auxiliary equipment. During FGTHROX downtime, Group 1 MON processes are shut down. Non-Group 1 processes may continue to operate and either vent locally or to FGSITESCRUBBERS. This EU is subject to the requirements of 40 CFR Part 63, Subparts FFFF and UU. The most recent PTI for this emission unit is PTI No. 175-20.

Emissions are controlled by several control devices; venturi scrubbers 7170 and 4776, which are shared with EU321-01, and scrubber 7158 which is shared with EU321-02. Condenser 5141 is a control device dedicated to this emission unit.

SC I.1. restricts VOC emissions to 0.44 tpy. SC VI.4. is the associated monitoring and recordkeeping requirement that requires the calculate and keep, in a satisfactory manner, records of monthly and 12-month rolling time period VOC emissions for EU321-11 using production records, operating records, and/or other data acceptable to the AQD District Supervisor. For the 12-month rolling time period ending February 2022, VOC emissions were 0.14 tpy.

Discussions regarding compliance of scrubbers 7170 and 4776 can be found under the EU321-01 heading and compliance discussions of scrubber 7158 can be found under the EU321-02 header.

SC III.4. restricts operation of equipment in EU321-11 that exhausts to condenser 5141 unless the coolant return temperature is 2°C or less. I reviewed coolant return temperatures for condenser 5141 for the timeframe August 1, 2021 through April 26, 2022. The plant was in compliance with this condition during the time period reviewed.

Table 5 shows the operating parameters observed during the inspection.

Table 5			

Pollution Control Device	Process/Operational Restriction	Value Observed	Secure Process Alarm (SPA)
Scrubber 7170	liquid flow rate is 4.8 gallons per minute or more	5.6 gpm	4.8 gpm
Scrubber 4776	liquid flow rate is 1.9 gallons per minute or more	3.3 gpm	1.9 gpm
Scrubber 7158	liquid flow rate is 3.0 gallons per minute or more	3.3 gpm	3.0 gpm
Condenser 5141	Coolant return temperature is 2°C	-1.4°C	2°C

To determine the accuracy of the data reviewed we require the plant calibrates parameter indicators at an appropriate frequency. SC IV.6. requires the plant to calibrate the liquid flow rate indicators for each of the scrubbers 7158, 7170, 4776 is calibrated and SC IV. requires calibration of the coolant return temperature indicator for condenser 5141. Table 6 shows the frequency of these calibrations are occurring at least every four years or more frequently.

Table 6		
Control Device	Date 1	Date 2
7170	3/24/2022	6/27/2020
7158	2/26/2022	3/28/2020
4776	4/16/2021	3/30/2017
5141	12/13/2021	12/28/2019

Compliance Reporting

EU321-11 did not report deviations in the 2021 Annual ROP deviation report.

NAME


DATE 5/16/2022

SUPERVISOR

