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

| A404362128 | | | | |
|---|--|---------------------------|--|--|
| 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: 03/09/2022 | | |
| STAFF: Gina McCann COMPLIANCE STATUS: Compliance | | SOURCE CLASS: MEGASITE | | |
| SUBJECT: EU324-01, EU324-08, EU324-11, and EU324-18 | | | | |
| RESOLVED COMPLAINTS: | | | | |

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

- Gina McCann (EGLE-AQD, Senior Environmental Quality Analyst)
- Amanda Karpas (Dow-Air Specialist)
- Lexi Helminski (324 Building Production Engineer-Transitioning to)
- Connor Kneip (324 Building Production Engineer-Transitioning from)
- Brandonw Bishop (Dow-Environmental Specialist)-via Teams call

This inspection consisted of four emission units, EU324-01, EU324-08, EU324-11 and EU324-18. All were in compliance with their associated permits at the time of the inspection.

EU324-01

This emission unit is the 4820 batch kettle process that produces silane and siloxane products. Emissions are controlled by service water condenser 4818 and chilled condensers 4804 and 4807. The chilled condensers alternate in operation. This emission unit is subject to the requirements of 40 CFR Part 63, Subparts FFFF and to the equipment leak provisions of 40 CFR Part 63, Subpart UU. The most recent PTI for this emission unit is PTI No. 15-13A.

The plant submitted a permit application to provide information supporting permit updates due to the updating of emission calculations form the consent decree (19-11880) with US EPA and to support process changes at the building. The PTI was issued June 29, 2021 with a R216 (2) minor modification request received September 16, 2021.

Special condition (SC) I.1 restricts VOC emissions to 9.56 ton per year (tpy) based on a 12month rolling time period as determined at the end of each calendar month. SC VI.3 is the associated monitoring and recordkeeping requirement that requires the plant to calculate the VOC emission rate from EU324-01 monthly, for the preceding 12-month rolling time period, using a method acceptable to the AQD District Supervisor. VOC emissions for the 12-month rolling time period ending January 2022 were 0.04 tpy.

We discussed how emissions were calculated for this unit and the emission factors from the model take into account both the 324-042 and 324-048 vent calculations. When the reaction is occurring, the emissions are sent to the 324-042 vent and when they are pulling vacuum emissions go to 324-048 vent.

Emissions are controlled by the service water condenser (4818) and a set of chilled condensers (4804 and 4807) that alternate in operation. Compliance regarding the shared condensers can

be found below.

SC III.2. restricts operation of EU324-01 unless the exit coolant temperature of the service water condenser 4818 is 40° C or less. SC VI.2. is the associated monitoring and recordkeeping requirement that requires the plant to monitor and record, in a satisfactory manner, the exit gas temperatures for chilled condensers 4804 and 4807 and service water condenser 4818 on a continuous basis. For the purposes 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 exit coolant temperatures on the 4818 condenser for the time period starting January 1, 2021 through March 8, 2022. On October 4, 2021 there appeared to be a deviation from this requirement. However, further investigation showed this was an instantaneous reading, for 4 minutes and the requirement is to record a 15 minute block average. The system in place did not flag this as a deviation, and it shouldn't, because the 15-minute average was below 40° C.

During the inspection I observed the following.

| Pollution Control Device | Process/Operational Restriction | SPA | Temperature Observed |
|---------------------------------------|---|-------|---|
| Service Water Condenser (4818) | the exit coolant temperature of the service water condenser 4818 is 40° C or less | 35°C | 24.66°C (not in operation at the time of the inspection) |
| Chilled Condensers (4804 and 4807) | exit coolant temperature of each condenser -8°C or less | -10°C | -26°C |

To ensure the temperature probes are reading accurate readings, SC IV.2 requires the plant to calibrate the temperature indicators for each condenser (4804, 4807, and 4818) in a satisfactory manner acceptable to the AQD District Supervisor. Calibrations were performed on the dates provided in the table.

Recent Temperature Calibrations

| EU | Transmitter | Transmitter Description | Maintenance Date | Maintenance Activity | |
|--------|-------------|-------------------------|---------------------|-------------------------|--|
| Shared | TT-1151 | | 8/29/2018 | Calibration | |

https://intranet.egle.state.mi.us/maces/WebPages/ViewActivityReport.aspx?ActivityID=24... 3/15/2022

| | | 4804/4807 condenser coolant return temperature transmitter | | |
|--------------|---------|--|-----------|-------------|
| Shared | TT-1151 | 4804/4807 condenser coolant return temperature transmitter | 2/10/2021 | Calibration |
| EU324- 01 | TT-1158 | 4818 condenser service water return temperature transmitter | 1/17/2018 | Calibration |
| EU324- 01 | TT-1158 | 4818 condenser service water return temperature transmitter | 2/4/2020 | Calibration |

<u>EU324-08</u>

This emission unit is the 5617 batch kettle process that produces silane and siloxane products and is controlled by condenser 5618 and, if pulling vacuum, chilled condensers 4804 and 4807, which alternate in operation. This emission unit 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. 14-13A.

The plant submitted a permit application to provide information supporting permit updates due to the updating of emission calculations form the consent decree (19-11880) with US EPA and to support process changes at the building. The PTI was issued October 18, 2021 with a R216(2) minor modification request received November 17, 2021.

SC I.1 restricts VOC emissions to 0.2 tpy based on a 12-month rolling time period as determined at the end of each calendar month. SC VI.4 is the associated monitoring and recordkeeping requirement that requires the plant to calculate the VOC emission rate from EU324-08 monthly, for the preceding 12-month rolling time period, using a method acceptable to the AQD District Supervisor. Since this unit was re-permitted during the last 12-month rolling time period, the plant is only required to comply with this limit effective the date of the modification request. However, the VOC emissions are calculated for the 12-month rolling time period, which includes emissions calculations performed under a previous permit. VOC emissions for the 12-month rolling time period ending January 2022 were 0.03 tpy.

Emissions are controlled by the service water condenser (5618) and a set of chilled condensers (4804 and 4807) that alternate in operation. Compliance regarding the shared condensers can be found below.

SC III.1. restricts operation of EU324-08 unless the service water exit temperature of condenser 5618 is 30°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 service water exit temperature of condenser 5618 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 service water exit temperature of condenser 5618 for the time period starting January 1, 2021 through March 8, 2022. On February 16, 2022 at 9:11 a.m. to February 16, 2022 at 11:19 a.m. there appeared to be a deviation from this requirement. However, further investigation showed the kettle was not running the entire time of the high temperature scenario.

| Pollution Control Device | Process/Operational Restriction | SPA | Temperature Observed |
|---|---|--------|-------------------------|
| Chilled Condenser (4804 and 4807) | the coolant exit temperature minus 13°C (-13°C) or less when conducting vacuuming stripping | -10°C | -26.3°C |
| Service Water | unless the service | 35°C * | 24.58°C |

temperature 30°C or

During the inspection I observed the following operations.

*interlocks at 30°C, but alarm still needs updating due to PTI issuance

water exit

less

To ensure the temperature probes are reading accurate readings, SC IV.3 requires the plant to calibrate the temperature indicators for condenser 5618 in a satisfactory manner acceptable to the AQD District Supervisor. Likewise, SC IV.4 requires the plant to equip and maintain chilled condensers 4804 and 4807 with a device to continuously monitor and record the condenser coolant exit temperature of the condenser to which the exhaust is being directed, when vacuum stripping. The permittee shall calibrate the coolant exit temperature indicator in a satisfactory manner acceptable to the AQD District Supervisor. Calibrations were performed on the dates provided in the table.

Recent Temperature Calibrations

Condenser

(5618)

TransmitterMaintenance MaintenanceEUTransmitter DescriptionDateActivity

| Shared | TT-1151 | 4804/4807 condenser coolant return temperature transmitter | 8/29/2018 | Calibration | |
|--------------|---------|---|-----------|-------------|----------|
| Shared | TT-1151 | 4804/4807 condenser coolant return temperature transmitter | 2/10/2021 | Calibration | |
| EU324- 08 | TT-1157 | 5618 condenser service water return temperature transmitter | 8/29/2018 | Calibration | |
| | | | | | FU224 40 |

<u>EU324-18</u>

This emission unit is the 25156 batch kettle in 324 building, which consists of a reactor, heat exchanger, and a receiver. Emissions are controlled by a service water cooled condenser and two parallel chilled condensers. This emission unit 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. 19-14C.

The plant submitted a permit application to provide information supporting permit updates due to the updating of emission calculations form the consent decree (19-11880) with US EPA and to support process changes at the building. The PTI was issued October 13, 2021 with a R216(2) minor modification request received November 17, 2021.

SC I.2 restricts VOC emissions to 23.03 tpy based on a 12-month rolling time period as determined at the end of each calendar month. SC VI.4 is the associated monitoring and recordkeeping requirement that requires the plant to calculate the VOC emission rate from EU324-18 monthly, for the preceding 12-month rolling time period, using a method acceptable to the AQD District Supervisor. VOC emissions for the 12-month rolling time period ending January 2022 were 6.54 tpy.

Emissions are controlled by the service water cooled condenser (25159) and a set of chilled condensers (4804 and 4807) that alternate in operation. Compliance regarding the shared condensers can be found below.

SC III.2. restricts operation of EU324-18 unless the service water condenser (25159) outlet coolant temperature is 45°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, except when producing 204 fluid, the chilled condenser pair (4804/4807) outlet coolant temperature with instrumentation acceptable to the AQD. For the purposes 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 the service water outlet coolant temperature of condenser 25159 for the time period starting January 1, 2021 through March 8, 2022. The plant was meeting the requirements of the permit during this time period.

| Pollution Control Device | Process/Operational Restriction | SPA | Temperature Observed |
|---------------------------------------|---|-------|-------------------------|
| chilled condenser pair (4804/4807) | outlet coolant temperature is -8°C or less | -10°C | -26.3°C |
| service water condenser (25159) | outlet coolant temperature is 45°C or less. | 37°C | 23.45°C |

During the inspection I observed the following operations.

4804/4807 Shared Condenser Set

The chilled condenser set is shared with EU324-01, EU324-08, and EU324-18. SC III.1. restricts operation of EU324-01 unless the exit coolant temperature of each condenser (4804 and 4807 is - 8°C or less. Likewise, EU324-18 has the same operating restriction, except when producing 204 fluid. The plant does not produce 204 fluid and has not in years. They maintain this operational flexibility in the permit. SC III.2. for EU324-08 has a similar restriction on the exit coolant temperature of each condenser (4804 and 4807), however the restriction is more restrictive at - 13°C. The plant operates as if each unit has the -13°C restriction.

I reviewed the chilled condenser pairs exit coolant temperature for the time period starting January 1, 2021 through March 8, 2022. There were six apparently high temperature scenarios. All were during times when the process was down for various troubleshooting and maintenance activities. The plant was in compliance for each emission unit special condition, restricting operation of the 4804/4807 shared condenser set, at the time of the inspection.

Calibration of the temperature transmitters on condenser 4804/4807 were performed on the dates provided in the table.

| Recent Temperature Calibrations | | | | | |
|---------------------------------|-------------|--|------------------|----------------------|--|
| EU | Transmitter | Transmitter Description | Maintenance Date | Maintenance Activity | |
| Shared | TT-1151 | 4804/4807 condenser coolant return temperature transmitter | 8/29/2018 | Calibration | |

Shared TT-11514804/4807 condenser coolant2/10/2021Calibrationreturn temperature transmitter

<u>EU324-11</u>

This emission unit is a batch distillation kettle 4895 including 4896 distillation column and 24924/24925/4898 overhead receivers. This emission unit 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. 152-20. No pollution control is associated with this emission unit.

The plant submitted a permit application to provide information supporting permit updates due to the updating of emission calculations form the consent decree (19-11880) with US EPA and to support process changes at the building. The PTI was issued August 11, 2021 with a R216(2) minor modification request received September 13, 2021.

SC I.2. restricts VOC emissions to 3.37 tpy based on a 12-month rolling time period as determined at he end of each calendar month. SC VI.2. is the associated monitoring and recordkeeping requirement that requires the plant to calculate the VOC emission rate from EU324-11 monthly, for the preceding 12-month rolling time period, using a method acceptable to the AQD District Supervisor. VOC emissions for the 12-month rolling time period ending January 2022 were 0.44 tpy.

During the inspection we viewed a process flow diagram for EU324-11. We discussed why heat exchanger 4895 was not considered an air pollution control device. This is a reflux condenser which recovers cyclics for the process and as a result may incidentally control VOC emissions, but the process would not operate without it.

NAME

DATE 3/15/2022

Chris Hare SUPERVISOR