

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

A404366572

FACILITY: Dow Silicones Corporation		SRN / ID: A4043
LOCATION: 3901 S Saginaw Rd, MIDLAND		DISTRICT: Bay City
CITY: MIDLAND		COUNTY: MIDLAND
CONTACT: Jim Alger , Midland Area State Air Permitting Specialist		ACTIVITY DATE: 03/01/2023
STAFF: Adam Shaffer	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MEGASITE
SUBJECT: Partial Compliance Evaluation of EU303-09 and EU303-11.		
RESOLVED COMPLAINTS:		

A partial compliance evaluation (PCE) consisting of an onsite inspection and records review was conducted by Air Quality Division (AQD) staff Adam Shaffer (AS) of the Dow Silicones Corporation (DSC) site located in Midland, MI. Applicable records were requested on February 14, 2023, to verify compliance with permit to install (PTI) No. 726-78C and Renewable Operating Permit (ROP) No. MI-ROP-A4043-2019a, specifically for emission units (EU)303-09 and EU303-11. Through these two emission units, select records were requested and reviewed for flexible groups (FG)LEAKDETECTION, FGSITEBLOWER, FGTHROX, FGSITESCRUBBER, and FGMONMACT. An in-person inspection to verify onsite compliance was later completed on March 1, 2023.

Facility Description

DSC is a chemical processing facility. The facility is a mega-site and is a major source of hazardous air pollutants (HAPs), nitrous oxides (NOx), particulate matter (PM) and volatile organic compounds (VOCs). Additionally, the site is subject to various federal regulations and the site is operating under an EPA Civil Order No. 19-11880.

Offsite Compliance Review

DSC is required to submit semi-annual and annual compliance reports per Part A General Conditions 19-23 of MI-ROP-A4043-2019a. Previous reports were reviewed for select time periods. After further review, there was potentially several deviations that corresponded with EU303-09 and/or EU303-11, however, the issues noted did not appear to constitute a violation.

Based on the timing of the inspection, the 2022 Michigan Air Emissions Reporting System (MAERS) Report was reviewed. Upon review it appears DSC uses "Emission Master" software when determining emissions for each product. DSC uses MAERS emission factors for natural gas used. Additionally, fugitive emissions such as from LDAR monitoring and emissions from spills are added in as well. Upon initial review of the MAERS Report, discrepancies were noted between the emissions reported and the records provided for several recent inspections. In a follow up phone conversation on April 24, 2023, it was concluded that the discrepancies were from DSC reporting both process emissions and fugitive emissions together. Data was reviewed for several emission units inspected. Minor errors were noted, however, after further review the 2022 MAERS Report appears acceptable. Additionally, at this time the supporting documentation is acceptable, though it was stated to DSC staff moving forward that more specific supporting documentation to better understand how DSC came to the amount of emissions reported per each unit will be required.

Compliance Evaluation

A request was sent to Mr. Jim Alger, Midland Area State Air Permitting Specialist, of DSC on February 14, 2023, for records required by ROP No. MI-ROP-A4043-2019a, specifically for units EU303-09, EU303-11, FGLEAKDETECTION, FGSITEBLOWER, FGTHROX, FGSITESCRUBBER, and FGMONMACT. The onsite inspection was later completed on March 1, 2023.

AQD staff AS arrived at the facility at 8:20am. Weather conditions at the time of the inspection were cloudy skies, snow showers and temperatures in the low 30's degrees Fahrenheit. Upon arrival AS met with Mr. Alger and several other company staff to initially go over records and later was provided a tour of the site, specifically of EU303-09 and EU303-11. Follow up items requested were provided by Mr. Alger and site-specific questions were answered by company staff at the time of the inspection.

As mentioned above DSC is a chemical processing facility. During the inspection, various components pertaining to EU303-09 and EU303-11 were reviewed and discussed at length with company staff.

ROP No. MI-ROP-A4043-2019a

EU303-09

This emission unit is for the flake resin hydrolysis process. This emission unit is subject to the requirements of 40 CFR Part 63, Subpart FFFF. EU303-09 is also subject to the requirements of 40 CFR Part 64 (CAM).

Onsite observations

Per Special Condition (SC) III.1, the permittee shall not operate equipment in EU303-09 that exhausts directly to either condenser 24697, FGTHROX, or FGSITESCRUBBERS unless one of the following is completed: the condenser 24697 exit gas temperature is 95°F or less, FGTHROX is operated properly, or the two site scrubbers in FGSITESCRUBBERS are operated in a satisfactory manner. At the time of the inspection, EU303-09 was not in operation, however, the condensers were noted to be running. Records were reviewed for select time periods while onsite. Of the records reviewed, one time (less than 15 minutes in duration) was noted where the exit gas temperature was over 95°F, which appeared to be when the site was down for annual maintenance. No additional times were noted that appeared to be a concern. Based on the records reviewed and verification by DSC staff, there appeared to be no times reviewed when EU303-09 was in operation and the three applicable control devices were not operating in a satisfactory manner.

Per SC III.2, the permittee shall not operate equipment in EU303-09 that exhausts first to condenser 3458 and then either to FGTHROX or FGSITESCRUBBERS unless the following is met: the condenser 3458 exit gas temperature is 10°C or less, and FGTHROX is operated properly or FGSITESCRUBBERS are operated properly. At the time of the inspection, EU303-09 was not in operation, however, the condensers were noted to be running. While speaking with company staff it was verified that at least for 2022, condenser 3458 was in operation, however, was not used to control EU303-09. The condenser 3458 was determined to be used to control EU303-06. The primary condenser used to control EU303-09 is condenser 24697 and condenser 3458 would only be used if 24697 is down. Temperature records were noted being taken, and several deviations from the temperature limit were identified. DSC staff intended to report those time periods as deviations. After further review, no further action is necessary at this time.

Per SC III.3, the permittee shall not operate EU303-09 unless the pressure drop across cyclone 3446 / reverse jet fabric filter 22770 is between 0"-20" of water column. It was noted during the inspection that the cyclone and reverse jet fabric filter each have their own pressure drop monitor. Records were reviewed for select time periods during the course of the inspection. After further review, based on the records reviewed and verification by DSC staff, there appeared to be no times when EU303-09 was in operation and the cyclone 3446 / reverse jet fabric filter 22770 was not operating properly.

Per SC IV.1, the permittee shall not operate equipment in EU303-09 that exhausts directly to either condenser 24697 / FGTHROX or FGSITESCRRUBBERS unless the respective air pollution control equipment is operating properly as specified in this special condition. As mentioned above, based on the records reviewed and observations made at the time of the inspection, the unit appeared to be operating in a satisfactory manner.

Per SC IV.2, the permittee shall not operate equipment in EU303-09 that exhausts directly to condenser 3458 and then either to FGTHROX or FGSITESCRRUBEERS unless the respective air pollution control equipment is operating properly as specified in this special condition. As mentioned above, the condenser was not used as a control for EU303-09 for the select time periods reviewed.

Per SC IV.3 / 5, the permittee shall install devices to monitor the exit gas temperature for condensers 24697 / 3458 and pressure drop monitors to measure the pressure drop for cyclone 3446 / reverse jet fabric filter 22770. Monitor devices were noted for all four pieces of air pollution control equipment at the time of the inspection. Readings taken from each monitor at the time are listed below and as mentioned above EU303-09 was not in operation at the time of the inspection.

Condenser 24697 – 24.87°C

Condenser 3458 – 1°C

Cyclone 3446 – -0.021 inch of water column

Reverse jet fabric filter 22770 – 0.014 inch of water column

Per SC IV.4, the permittee shall not operate EU303-09 unless the cyclone / reverse jet fabric filter 3446 / 22770 is installed and operating in a satisfactory manner. At the time of the inspection, EU303-09 was not in operation, however, the pressure drop meters were running. Additionally, records were reviewed for select time periods while onsite. Based on the records reviewed and verification by DSC staff, there appeared to be no times when EU303-09 was in operation and the applicable pollution control equipment was not operating in a satisfactory manner. It was also noted during the inspection that the immediate area around the cyclone / reverse jet fabric filter 3446 / 22770 was clean and also indicated satisfactory operation.

There are eleven stacks associated with this emission unit, though three of the stacks are for the THROX and site scrubbers, and were not reviewed. Photo verification of the stack exhaust dimensions for EU303-09 were requested and later reviewed. Based on the observations made, the stack dimensions appear to be consistent with what is identified in MI-R0P-A4043-2019a.

Recordkeeping

Per SC I.1, this emission unit is subject to a VOC emission limit of 3.47 tons per year (tpy) per a 12-month rolling time period. Records were requested and reviewed for select time periods. For the month of December 2022, 8.1 lbs of VOC emissions were reported. As of December 2022, 104.19 lbs of VOCs were reported per a 12-month rolling time period which is within the permitted limit. Previous 12-month rolling time periods reviewed also appeared to be within the permitted limit.

Per SC VI.2, the permittee shall monitor and record on a continuous basis, the exit gas temperature of condensers 3458 and 24697 with instrumentation acceptable to the AQD. Records were requested and reviewed at length for select time periods at the time of the inspection. Based on the records reviewed, DSC appeared to be keeping track of exit gas temperature records for the two condensers.

Per SC VI.3, the permittee shall monitor and record on a continuous basis, the pressure drop readings for the cyclone / reverse jet fabric filter 3446 / 22770 with instrumentation acceptable to the AQD. Records were requested and reviewed for select time periods at the time of the inspection. Based on the records reviewed, DSC appears to be keeping track of pressure drop readings for the cyclone / reverse jet fabric filter.

Per SC VI.4, the permittee shall keep track of monthly / 12-month rolling time period VOC emission records for EU303-09. Records were requested and reviewed for select time periods. Based on the records reviewed, DSC appears to be keeping track of applicable VOC emission records.

EU303-11

This emission unit is for a T57 waste tank. This emission unit is exempt from air permit to install requirements pursuant to Rule 284. This emission unit is subject to the requirements of 40 CFR Part 61, Subparts A, J, and V.

Onsite Observations

This emission unit consists of one tank; however, several additional tanks appear to have been added with this tank (group) for a total of six tanks with two of them being compartmentalized. The tanks were observed during the course of the inspection. Several of the tanks were stated by DSC staff to be controlled by EUTHROX. Dates of the installation for the tanks was requested and provided. The six tanks were installed over the course of three dates (1968 / 2000 / 2012). Additionally, even though several tanks are connected to EUTHROX, it does not appear the company takes credit for that control.

Recordkeeping

The company uses the Rule 284(2)(i) exemption for the tanks observed. A list of tank sizes were provided that showed a range of 189.18 gallons to 23,206.99 gallons which is in the 40,000-gallon size requirement. The vapor pressures for the materials stored in the tanks ranged from 0.065 psia – 1.17 psia which is within the 1.5 psia. The materials stored in the tanks were all described as VOC / non-carcinogenic containing materials. Following the inspection, Safety Data Sheets (SDS) were requested for several of the tanks to verify the information identified was correct. Information was provided and after further review, the tanks would appear to be exempt per Rule 284(2)(i). It was noted that some information for

tank materials is collected from an "Emission Master Program". This program appears to collect information from several sources on thousands of different chemicals. This appears acceptable.

FGLEAKDETECTION

This flexible group is for emission units subject to the requirements of 40 CFR Part 61, Subpart A (General Provisions), Subpart J (National Emission Standard for Equipment Leaks (Fugitive Emission Sources) of Benzene), and Subpart V (National Emission Standard for Equipment Leaks (Fugitive Emissions Sources)).

It should be noted that only portions of this flexible group were reviewed in order to verify that EU303-11 is in compliance with FGLEAKDETECTION.

It was verified, specifically for EU303-11, for select time periods requested and reviewed, that there were no leaks for this emission unit.

FGSITEBLOWER

This flexible group is for the site vent consolidation and blower system that collects vapor streams from numerous emission units and vents throughout the facility and routes them to either the on-site thermal oxidizer with heat recovery (EUTHROX) or to a site-wide water scrubber system. There are two parts to the site vent consolidation and blower system: a dry vent header system for water reactive vent and wet vent header system for vents that can contain water.

It should be noted that only portions of this flexible group were reviewed in order to verify that EU303-09 and EU303-11 are in compliance with FGSITEBLOWER.

Per SC IV.1, the permittee shall not operate the emission units in FGSITEBLOWER unless they are routed to EUTHROX or the site wide water scrubbers except as further described in this condition, and the control device is installed, maintained and operated in a satisfactory manner in accordance with the sites Malfunction Abatement Plan (MAP). Dates of any events where emissions from FGSITEBLOWERS being sent to EUTHROX / site wide scrubbers when EUTHROX / site wide scrubbers were not in operation were requested for select time periods. It was verified by company staff that no incidents occurred in 2022. This appears acceptable.

Per SC VI.1, the permittee shall record the time and duration of each bypass episode wherein the vents comprising FGSITEBLOWER are not routed to EUTHROX. Records were requested and provided for bypass episodes that would involve EU303-09 and EU303-11. Records provided showed that there were five instances in 2022 that emissions from EU303-09 were vented to FGSITESCRUBBERS instead of EUTHROX. Each of the events were noted to not last more than an hour and were further described as an issue with EUTHROX that was resolved and resumed operation or EU303-09 was shut down per the Startup Shutdown Malfunction Plan (SSMP). The tanks associated with EU303-11 are exempt and it initially appeared that DSC does not keep track of bypass episodes for the tanks connected to EUTHROX. It was later determined that for the tanks connected to the EUTHROX all outages would be considered bypass episodes and are recorded. For the tanks not connected to EUTHROX, since the tanks are considered exempt per Rule 284(2) (i), there are no emission limits for this exemption which would require control. The exact

reasoning some tanks are connected / not connected to the EUTHROX is unclear, however, at this time, it appears acceptable, and no further action is necessary.

FGSITESCRUBBER

This flexible group is for the site-wide water scrubber system. FGSITESCRUBBERS will remove HCl and chlorosilanes from the FGSITEBLOWER consolidated vent system prior to discharge to atmosphere when the site wide thermal oxidizer system is not operating properly.

It should be noted that only portions of this flexible group were reviewed in order to verify that EU303-09 and EU303-11 are in compliance with FGSITESCRUBBERS.

Per SC I.1, this flexible group is subject to a 7.1 pounds per hour (pph) benzene emission limit per testing protocol and/or the Benzene Emissions Management and Monitoring Plan (BEMMP). Records were requested and reviewed for select time periods. The highest pph noted for 2022 was 5.4 pph which is well within the permitted limit. It was later noted that this value is the worst case of each vent for that particular time period (month) and not necessarily were all vent emissions on the same day. This appears to show that even adding together the worst-case emissions for that time period, DSC is still in compliance. Based on the records reviewed, it appears that DSC is meeting this emission limit.

Per SC III.2, the permittee shall not bypass EUTHROX unless the vents listed in this flexible group are routed to either the site wide scrubbers or the control equipment specified in these vents' emission unit tables in ROP No. MI-ROP0A4043-2008 (or subsequent revisions) and the control equipment is installed, maintained, and operated in a satisfactory manner. Records were requested for time periods where emissions from the applicable vents were controlled by EUTHROX or site wide scrubbers or local control where it was not operating properly. It was verified by DSC staff that in 2022, there were no instances where at least one of the three control methods (EUTHROX, FGSITESCRUBBER, and/or local control) was not operating properly. This appears acceptable.

Per SC III.5, proper operation of the site wide water scrubbers includes the total scrubber water flow rate shall not be less than the minimum flow rates specified in the MAP, dated February 14, 2018. As discussed above, it was verified by DSC staff that in 2022 there were instances when emissions were rerouted from going to the THROX to the site wide scrubbers and when EU303-09 and/or EU303-11 would have been being controlled by the mentioned equipment. Flow rates during those time periods were requested and reviewed. The MAP requires each section of the scrubbers to have a minimum flow rate of 50 gallons per minute when accepting emissions and the combined flow rate from the recycle and city water shall be 100 gallons per minute. Flow rate records reviewed for the select times that emissions were being vented to FGSITESCRUBBERS appeared to show that the applicable flow rates were being met. After further review this appears acceptable.

Per SC VI.2, the permittee shall keep track, in a satisfactory manner, of continuous records of scrubber flow rates for the site wide water scrubbers. As mentioned above, records for when FGSITESCRUBBERS were being used to control emissions were requested and provided. Based on the records provided, DSC appears to be meeting this condition.

Per SC VI.3, the permittee shall keep, in a satisfactory manner, records demonstrating that the BEMMP is being implemented and maintained as required by SC III.1. As discussed above, applicable records were requested for select time periods to verify the hourly

benzene emission rate. Based on the records provided, DSC appears to be meeting the requirements for this condition. It was also verified by DSC staff that the BEMMP dated February 14, 2018, is being followed.

FGTHROX

This flexible group is for the site wide thermal oxidizer system. The THROX will remove VOC, HAPs, PM10, hydrogen chloride, and other toxic air contaminants from the FGSITEBLOWER consolidated vent system prior to discharge to atmosphere. This flexible group is subject to the requirements of 40 CFR Part 63, Subpart FFFF. FGTHROX is a CAM subject emission unit subject to the requirements of 40 CFR Part 64.

It should be noted that only portions of this flexible group were reviewed in order to verify that EU303-09 and EU303-11 are in compliance with FGTHROX.

Per SC IV.1, the permittee shall not route process vents to EUTHROX unless the burner, quencher, absorber, and two 2-stage ionizing wet scrubbers (IWS) in series are installed, maintained, and operated in a satisfactory manner. Satisfactory operation includes various criteria that are then listed in this condition. Temperature records for EUTHROX were requested and provided for select time periods.

Regarding EU303-09, it was verified that for the time periods reviewed, local controls were operating in a satisfactory manner. Therefore, the emissions from EU303-09 did not need to be controlled by EUTHROX. Regarding EU303-11 / the several tanks that would be controlled by EUTHROX for select time periods, it would appear that any times the EUTHROX was not operating properly, applicable corrective actions were taken. Additionally, it was determined that tanks associated with EU303-11 that are connected to EUTHROX would always be controlled by the THROX unless they were empty.

FGMONMACT

This flexible group applies to miscellaneous organic chemical manufacturing process units (MCPU) that are located at, or are part of, a major source and meet the criteria specific in 40 CFR Part 63 Subpart FFFF (NESHAP Subpart FFFF).

It was verified by company staff that the two emission units EU303-09 and EU303-11 are categorized as Group 2 per the NESHAP Subpart FFFF. The emission units EU303-02, EU303-11, EU303-14, EU303-17 and EU303-18 are part of miscellaneous organic chemical manufacturing process units (MCPU)-032. DSC provided verification on how this MCPU is not subject to Group 1 requirements. DSC takes the total estimated production and applicable emissions for all units for that year and multiplies by three. The projected emissions for 2022 and 2023 for MCPU-032 are 2,341 lbs/yr which is within the 75% setpoint it appears the company has established and well within the 10,000 lbs/yr limit to qualify as a Group 2 per the NESHAP Subpart FFFF. This appears acceptable.

Additional Observation

It was noted in the most recent PTI No. 726-78C for EU303-09 that SC IV.1 incorrectly labels condenser 24697 as 24597. This would appear to have been an error during the permitting process. Moving forward this shall be addressed appropriately.

Conclusion

Based on the observations made and records reviewed, DSC appears to be in compliance with MI-ROP-A4043-2019a, specifically the portions related to EU303-09 and EU303-11.

NAME Adam J. Miller

DATE 05/22/23

SUPERVISOR C. Lane