DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Scheduled Inspection

A404324896

FACILITY: Dow Corning - Midland Plant		**SRN / ID:** A4043
LOCATION: 3901 S Saginaw Rd, MIDLAND		**DISTRICT:** Saginaw Bay
CITY: MIDLAND		**COUNTY:** MIDLAND
CONTACT: Mike Gruber , Air & Water Team Leader		**ACTIVITY DATE:** 03/19/2014
STAFF: Jennifer Lang	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MEGASITE
SUBJECT: EU502-01, EU502-07, EU505-01 & EU515-01 - Scheduled Inspection		
RESOLVED COMPLAINTS:		

Inspection date: 3/19/14
Inspection started: 9:00 am
Inspection ended: 12:00 pm

Dow Corning and MDEQ-AQD staff present during the inspection.

Jenny Lang (MDEQ-AQD, Environment Engineer Specialist)
Steve Moser (Dow Corning, Assistant General Council)
Mike Gruber (Dow Corning, Air & Water Team Leader)

EU502-01

Compliance Status: Compliance

Items noted during the inspection.

1. EU502-01 covers the 502 chlorosilane distillation manufacturing process, including distillation columns, tanks, purification beds, loading and unloading stations, condensers, scrubbers, and related equipment. EU502-01 is equipped with the following air pollution control (APC) equipment: 304 vent recovery system, 337 wet scrubber and FG325-01 (i.e., carbon bed and scrubber system – historically used when 304 vent recovery is down). According to the ROP renewal application received by the MDEQ-AQD on 3/4/13, EU502-01 also vents to FGTHROX, FGSITESCRUBBERS, FGSITEBLOWER and FGBULKMOVE. FGTHROX and FGSITESCRUBBERS are the primary control devices for EU502-01. 304 vent recovery, the 337 wet scrubber and FG325-01 are legacy control devices associated with the emission unit, and they're used when the primary control devices are down. This operational scenario is covered by the facility's malfunction abatement plan (MAP).

   I did not inspect FGTHROX, FGSITESCRUBBERS, FGSITEBLOWER and FGBULKMOVE (flexible groups associated with EU502-01) during my inspection as I previously inspected them on 11/13/13 and found them to be in compliance with air quality rules and regulations. The THROX and FGSITESCRUBBERS were operational at the time of my inspection.

2. Condition no. VI.1 of table EU502-01 of ROP No. MI-ROP-A4043-2008 (hereinafter "ROP") states, within 30 days following the end of each calendar month, Dow Corning (DC) shall calculate and record emissions from the process for the previous month to demonstrate compliance with the 12-month rolling time period emission limit specified in the table. Condition no. I.2 of the same table in the ROP limits VOC emissions from EU502-01 to 22.8 tpy (based on a 12-month rolling time period as determined at the end of each calendar month). During the inspection, I asked for the 12-month rolling total VOC emissions through January 2014 for EU502-01. On 4/9/14, I received the requested information. According to data provided by DC (see attached), the 12-month rolling total VOC emissions through January 2014 for EU502-01 was 0.66 tpy.

3. Condition no. VI.3 of table EU502-01 of the ROP states, DC shall monitor and record, on a continuous basis (i.e., at least once every 15-minutes), the exit gas temperature of condenser 2044 (FG304VENTRECOVERY) and the liquid flow rate for the 337 wet scrubber (FG337SCRUBBER). Condition no. III.1 of the same table in the ROP states, proper operation of the refrigerated vent condenser (2044)

means the exit gas temperature will not exceed -76 degrees C. Condition no. III.2 of the same table in the ROP states, proper operation of the 337 wet scrubber (spray towers 9950 and 9960) means a minimum flow rate of 45.0 gpm. I did not inspect FG304VENTRECOVERY and FG337SCRUBBER (flexible groups associated with EU502-01) during my inspection as I previously inspected them on 11/26/13 and found them to be in compliance with air quality rules and regulations.

4. Condition no. VII.5 of table EU502-01 of the ROP states, each semiannual report of deviations shall include summary information on the number, duration and cause of CAM excursions and/or exceedances and the corrective actions taken. Condition no. VII.6 of the same table states, each semiannual report of deviations shall include summary information on the number, duration and cause (including unknown cause, if applicable) for CAM monitor downtime incidents (other than monitor downtime associated with zero and span or other daily calibration checks, if applicable). According to the latest ROP deviation report received on 3/14/14 for reporting period 1/1/13 through 12/31/13, DC had the following CAM excursion/exceedance on 8/7/13 at EU502-01. There were no monitor downtime incidents for EU502-01 during the reporting period.

   - *Process vents from 304 vent recovery were diverted from THROX to the 337 scrubber (9960) without any water flow going to the scrubber. This occurred flowing maintenance on 9960 scrubber. The lockout was removed without verifying that the feed valve to the scrubber was closed. Upon discovery of the incident, water flow to the scrubber was turned on and the feed valve to the scrubber was closed, sending vents back to THROX. A project is currently underway to add interlocks to the scrubbers that would prevent vents from being diverted to the scrubbers without adequate water flow. The duration of the event was 25 minutes.*

   In my opinion, this incident has been sufficiently resolved. Therefore, no further action regarding enforcement will be taken by me at this time.

5. Table EU502-01 in the ROP lists FGLEAKDETECTION (40 CFR 61, Subparts A, J and V) as an applicable requirement. According to the ROP renewal application received by the MDEQ-AQD on 3/4/13, this does not apply as EU502-01 does not have any equipment in benzene service.

6. Condition nos. VI.2, VII.4 and IX.2 of table EU502-01 of the ROP requires DC to comply with 40 CFR Part 60, Subpart Kb for the following storage vessels: DV100, DV102, DV106, DV150, DV151, DV154, DV159, DV256, DV25-100 and DV25-101. During the inspection, I requested the following information for these vessels: design capacity, material stored and vapor pressure. On 4/9/14, I received the requested information (see attached). Based upon this information, on 4/11/14, I asked DC whether or not vessel nos. DV100, DV102, DV150, DV25-100 and DV25-101 at EU502-01 are equipped with one of the following:

   - A fixed roof in combination with an internal floating roof, or
   - An external floating roof, or
   - A closed vent system and control device

   According to an email from Steve Moser (DC, Assistant General Council) on 4/16/14, vessel nos. DV100, DV102, DV150, DV25-100 and DV25-101 at EU502-01 are equipped with a closed vent system and a control device. Based upon the type of device the vessel is equipped with, certain testing and recordkeeping provisions apply. Compliance with these provisions was not evaluated during the inspection. However, assuming the control device is the THROX or the site-wide scrubbers (FGSITESCRUBBERS), compliance for these control devices was previously determined on 11/13/13, and they were found them to be in compliance with air quality rules and regulations.

EU502-07

Compliance Status: Compliance

Items noted during the inspection.

1. EU502-07 covers trichlorosilane (TCS) distillation equipment used for purifying crude TCS into various grades (electronic, chemical, and plant grade) of TCS product. This process is equipped with the following air pollution control equipment: 304 vent recovery system, 337 wet scrubber, tanker trailer vapor equalization and FG325-01 (i.e., carbon bed and scrubber system – historically used when 304 vent recovery is down). According to the ROP renewal application received by the MDEQ-AQD on 3/4/13, EU502-07 also vents to FGTHROX, FGSITESCRUBBERS, FGSITEBLOWER and FGBULKMOVE. FGTHROX and

FGSITESCRUBBERS are the primary control devices for EU502-07. 304 vent recovery, the 337 wet scrubber and FG325-01 are legacy control devices associated with the emission unit, and they're used when the primary control devices are down. This operational scenario is covered by the facility's malfunction abatement plan (MAP).

I did not inspect FGTHROX, FGSITESCRUBBERS, FGSITEBLOWER and FGBULKMOVE (flexible groups associated with EU502-07) during my inspection as I previously inspected them on 11/13/13 and found them to be in compliance with air quality rules and regulations. The THROX and FGSITESCRUBBERS were operational at the time of my inspection.

2. Condition no. VI.1 of table EU502-07 of the ROP states, DC shall keep a record of the total number of hours during the current 12-month rolling time period that tank no. 153 has been filled with chlorosilanes while the 304 vent recovery system is not installed and operating properly. Condition no. IX.2 of the same table in the ROP states, for up to 336 hours per 12-month rolling time period as determined at the end of each calendar month, DC may fill tank no. 153 with chlorosilanes while the 304 vent recovery system is not installed and operating properly, if emissions from such filling are exhausted to the back-up control devices (presumably FG325-01). According to Mike Gruber, tank no. 153 now vents to the site scrubber (FGSITESCRUBBER) more than 99% of the time. This vent scenario is covered by FGBULKMOVE under PTI no. 91-07E. The previous vent scenario was covered by PTI no. 185-07). Based upon the block flow diagram provided to me on 4/10/11 (see attached), tank no. 153 vents to the site scrubber as its primary control device, 304 vent recovery as its secondary control device, and 325 carbon beds as its tertiary control device. Further, based upon information presented by DC on 4/9/14 (see attached), the total number of hours during the 12-month rolling time period through January 2014 that tank no. 153 has been filled with chlorosilanes while the 304 vent recovery is not installed and operating properly (i.e., emissions are vented to the 325 carbon beds) was 0 hours. Now that the site-scrubber is the primary control device for tank no. 153, it rarely vents to the 325 carbon beds.

3. Condition no. VI.2 of table EU502-07 of the ROP states, within 30 days following the end of each calendar month, Dow Corning (DC) shall calculate and record emissions from the process for the previous month to demonstrate compliance with the 12-month rolling time period emission limit specified in the table. Condition no. I.1 of the same table in the ROP limits TCS and tetratrichlorosilane emissions from EU502-07 to 6.0 tpy (based on a 12-month rolling time period as determined at the end of each calendar month). During the inspection, I asked for the 12-month rolling total emissions through January 2014 for EU502-07. On 4/9/14, I received the requested information. According to data provided by DC (see attached), the 12-month rolling total TCS and tetratrichlorosilane emissions through January 2014 for EU502-07 was 0.021 tpy.

4. Condition nos. VI.3, VII.4 and IX.4 of table EU502-07 of the ROP requires DC to comply with 40 CFR Part 60, Subpart Kb for the following storage vessels: DV153, DV155, DV252, DV25-102, DV25-105 and DV25-107. During the inspection, I requested the following information for these vessels: design capacity, material stored and vapor pressure. On 4/9/14, I received the requested information (see attached). Based upon this information, none of these tanks store a VOL (volatile organic liquid) subject to the provisions of 40 CFR Part 60, Subpart Kb. According to DC, all of the aforementioned tanks store trichlorosilane.

EU505-01

Compliance Status: Compliance

Items noted during the inspection.

1. EU505-01 covers resin and coating manufacturing including reactors, kettles, storage tanks, condensers, scrubber, drum off, vacuum system and related equipment. This process is equipped with the following air pollution control equipment:

   - Chilled condensers (16092, 25094, 6553, and 5-510). These condensers are legacy control equipment and emissions are vented through them prior to the THROX. Condenser 16092 is a backup to condenser 25094. Condenser 25094 was operating at the time of my inspection. It should be noted that the air permit does not allow DC to exceed the temperature requirement for condenser 5-510 when venting to the THROX.
   - Vapor balance system
   - Water scrubber 6547. Scrubber vents directly to atmosphere.
   - Carbon adsorbers. Controls emissions from tank nos. 5-508 and 5-509.

- FGTHROX (site-wide THROX)
- FGSITESCRUBBERS (site-wide scrubber)

I did not inspect FGTHROX or FGSITESCRUBBERS during my inspection as I previously inspected them on 11/13/13 and found them to be in compliance with air quality rules and regulations. The THROX and FGSITESCRUBBERS were operational at the time of my inspection.

2. Air Permit to Install (PTI) No. 169-12 covers EU505-01. This permit was issued on 2/19/13. ROP modification application no. 201300048 was received by the MDEQ-AQD on 3/7/13. This application covers the addition of PTI 169-12 to the ROP. To date, the PTI has not been rolled into the ROP. For the purpose of determining compliance during the inspection, PTI 169-12 was used instead of table EU505-01 in the current ROP.

3. Condition no. VI.1 of table EU505-01 of the ROP states, in part, DC shall monitor and record, on a continuous basis (i.e., at least once every 15-minutes), the coolant exit temperature of condenser nos. 6553, 16092 and 25094. Condition no. III.2 of the same table in the ROP states, unless these condensers are venting to the THROX and the THROX is installed an operating properly, the coolant exit temperature of each condenser shall not exceed 7 degrees C. At approximately 10:55 am, I observed the following operational parameter data for the condensers in the control room for EU505-01 at Building 505. Nirav Patel (DC Manufacturing Engineer) provided the data. Condenser 6553 controls emissions from tanks and kettles. Condenser 16092 is a backup to condenser 25094. Condenser 25094 controls emissions from kettles and tanks (i.e., storage tanks and a blend tank). DC was operating equipment which vents to condenser nos. 6553 and 25094 at the time of my inspection.

Operational Parameter	Observed Value	Alarm Set Point**
Condenser 6553 coolant exit temperature	-20.8 degrees C (instantaneous)	≥ 7 degrees C
Condenser 16092 coolant exit temperature (backup to condenser 25094)	-11.8 degrees C (instantaneous)	≥ 7 degrees C
Condenser 25094 coolant exit temperature	-21.1 degrees C (instantaneous)	≥ 7 degrees C

**All alarm set points are instantaneous.

4. Condition no. VI.1 of table EU505-01 of the ROP states, in part, DC shall monitor and record, on a continuous basis (i.e., at least once every 15-minutes), the coolant return temperature of condenser no. 5-510. Condition no. III.3 of the same table in the ROP states, if the coolant return temperature of condenser no. 5-510 exceeds 7 degrees C, the permittee shall implement corrective action and maintain a record of action taken to prevent reoccurrence. It should be noted that the air permit does not allow DC to exceed the temperature requirement for condenser 5-510 when venting to the THROX. At approximately 10:55 am, I observed the following operational parameter data for condenser 5-510 in the control room for EU505-01 at Building 505. Nirav Patel (DC Manufacturing Engineer) provided the data. Condenser 5-510 controls emissions from a waste tank and the tank farm. DC was operating equipment which vents to condenser no. 5-510 at the time of my inspection.

Operational Parameter	Observed Value	Alarm Set Point**
Condenser 5-510 coolant return temperature	-16.5 degrees C (instantaneous)	≥ 7 degrees C

**All alarm set points are instantaneous.

5. Condition no. VI.1 of table EU505-01 of the ROP states, in part, DC shall monitor and record, on a continuous basis (i.e., at least once every 15-minutes), the liquid flow rate of scrubber no. 6547. Condition no. III.4 of the same table in the ROP states, if the liquid flow rate of scrubber no. 6547 is less than 5 gpm, the permittee shall implement corrective action and maintain a record of action taken to prevent reoccurrence. At approximately 10:55 am, I observed the following operational parameter data for the scrubber in the control room for EU505-01 at Building 505. Nirav Patel (DC Manufacturing Engineer) provided the data. Scrubber no. 6547 controls emissions from the hydrolysis loop. DC was operating equipment which vents to the scrubber at the time of my inspection.

Operational Parameter	Observed Value	Alarm Set Point**
Scrubber 6547 liquid flow rate	9.8 gpm (instantaneous)	≤ 7 gpm

**All alarm set points are instantaneous.

6. Condition no. VI.2 of table EU505-01 of the ROP states, DC shall make available production records on a monthly basis and other records necessary to demonstrate compliance with emission limits in EU505-01 SC I.1 and I.2. I did not request a copy of this information during my inspection as it's confidential, and it's my assumption that this information is included in the 12-month rolling time period emission calculation discussed in item no. 8 below.

7. Condition no. VI.3 of table EU505-01 of the ROP states, DC shall maintain a record of tank dimensions and capacity for tank nos. 5-508 and 5-509. However, during the inspection, Mike informed me that the requirements of Kb were superseded with the requirements of the OLD MACT (40 CFR 63, Subpart EEEE). Therefore, Kb is no longer applicable.

8. Condition no. VI.4 of table EU505-01 of the ROP states, within 30 days following the end of each calendar month, DC shall calculate the VOC emission rate from EU505-01 monthly, for the preceding 12-month rolling time period. Condition no. I.2 of the same table in the ROP limits VOC emissions from EU505-01 to 11.2 tpy (based on a 12-month rolling time period as determined at the end of each calendar month). During the inspection, I asked for the 12-month rolling total VOC emissions through January 2014 for EU505-01. On 4/9/14, I received the requested information. According to data provided by DC (see attached), the 12-month rolling total VOC emissions through January 2014 for EU505-01 was 1.95 tpy.

9. Condition no. VI.6 of table EU505-01 of the ROP states, pursuant to the requirements of 40 CFR 63.2390(b) (OLD MACT), DC shall monitor and record, on a monthly basis, the weight of the carbon drums associated with storage tanks 5-508 and 5-509, to detect breakthrough of the associated carbon totes. According to DC, the control system for each tank is made up of a carbon tote and drum in series. During the inspection, DC provided me with the required records for the months of January, February and March, 2014. Copies of the records were received on 4/9/14 (see attached). Based upon these records, DC is complying with the requirements of condition no. VI.6 of table EU505-01 of the ROP. With regard to the February 2014 record, the carbon drums for tank nos. 5-508 and 5-509 were not changed out as the weight gain in each drum (< 1 lb.) was assumed to be due to ice and snow build up on the drums.

   According to an OLD MACT semi-annual compliance report received by the AQD on 9/16/08 for reporting period 1/1/08 through 6/30/08:

   The carbon totes on tanks 5-508 and 5-509 will be weighed monthly to ensure saturation. If the carbon totes have gained 80 lbs. or more since installation, then the totes will be replaced within three days. According to DC's vent calculations, the carbon totes will only need to be changed bi-annually assuming that the months of June, July, August, and September are divided evenly among the six month periods. Peak emissions will not normally be experienced during loading of the tanks since vapor balancing will continue to be utilized during normal loading of tanks 5-508 and 5-509.

   A desorption schedule is not applicable since all carbon totes will be sent offsite for disposal or regeneration.

10. According to an OLD MACT semi-annual compliance report received by the AQD on 9/16/08 for reporting period 1/1/08 through 6/30/08:

    As of 2/1/08, DC began use of carbon as control on the vents from tanks 5-508 (toluene) and 5-509 (xylene). As of 10/1/08, DC plans to change the carbon control system from totes and drums in series to only totes. DC will continue to utilize the work practice of vapor balancing during the normal loading of these tanks.

    In an email dated 3/24/14, I asked DC to confirm whether or not it was a tote and drum in series, or only totes in series, as I was told during the inspection that it was a tote and drum in series. In an email dated 4/9/14 (see attached), DC verified that it is a tote and drum in series.

11. According to the latest NOCSR (notification of compliance status report) for the OLD MACT dated 10/4/07:

As required by 63.2382(d)(2)(ii), tanks 5-508 (toluene) and 5-509 (xylene) will utilize vapor balancing to comply with 40 CFR 63, Subpart EEEE. Tanks 5-508 and 5-509 high pressure relief valves relieve at less than 2.5 psig. At this time, DC believes this to be adequate as numerous sources draw from these tanks on a regular basis. The pressures in both tanks are monitored and recorded on a continuous basis. DC will review the pressure trends for these tanks and continue to evaluate if transfers into the tanks or daily temperature variations cause pressures to approach the relief pressures.

Following the inspection in an email dated 3/24/14, I requested DC send me 15-minute data collected for tank nos. 5-508 and 5-509 on 3/19/14 as well as their alarm setpoints. On 4/9/14, I received the requested information (see attached). Based upon this information, high and low alarm setpoints have been established at 8 and 1 inches of water column, respectively. Based upon the 15-minute pressure data provided by DC for tank nos. 5-508 and 5-509, the pressure of both tanks remained within the established setpoints on 3/19/14.

12. On 3/14/14, the MDEQ-AQD received the latest semi-annual OLD MACT compliance report for reporting period 7/1/13 through 12/31/13. According to this report, there were emissions to the air from both tanks due to high pressure events. DC also reported emissions to the air as a result of high pressure events for these tanks in their prior Subpart EEEE semi-annual compliance report covering reporting period 1/1/13 through 6/30/13. Although, it should be noted that some of the events in the first semi-annual report period carried over into the second semi-annual report period. The reported deviations were discussed with Chris Hare, AQD District Supervisor, and it was determined that the non-compliance issues were sufficiently resolved as described in the semi-annual reports. Therefore, a violation notice will not be written at this time. However, AQD staff will monitor future OLD MACT semi-annual reports for similar deviations and a violation notice will be written if appropriate.

13. Condition no. VII.1 of table EU505-01 of the ROP states, each semiannual report of deviations shall include summary information on the number, duration and cause of CAM excursions and/or exceedances and the corrective actions taken. Condition no. VII.2 of the same table states, each semiannual report of deviations shall include summary information on the number, duration and cause (including unknown cause, if applicable) for CAM monitor downtime incidents (other than monitor downtime associated with zero and span or other daily calibration checks, if applicable). According to the latest ROP deviation report received on 3/14/14 for reporting period 1/1/13 through 12/31/13, there were no CAM excursions and/or exceedances or monitor downtime incidents for EU505-01.

14. Condition no. IX.2 of table EU505-01 of the ROP states, for storage tank nos. 5-508 and 5-509, DC shall replace the activated carbon for the tanks within 3 days after breakthrough of the carbon tote is detected in the carbon drum. Following the inspection in an email dated 3/24/14, I asked DC to provide me with breakthrough detection dates for 2013 and 2014, as well as when the carbon drum was replaced. According to information provided by DC on 4/9/14, all carbon drum replacements occurred the same day breakthrough was detected.

15. EU505-01 is subject to the requirements of 40 CFR Part 61, Subparts A, J and V (FGLEAKDETECTION). The latest semi-annual report for FGLEAKDETECTION was received by the MDEQ -AQD on 2/18/14. This report covers reporting period 8/1/13 through 1/31/14. Based upon this report, no leaks were found during the reporting period.

EU515-01

Compliance Status: Undetermined – Will be determined at a later date.

Items noted during the inspection.

1. EU515-01 covers the Grignard process for production of chlorosilanes and related materials including reactors, distillation, filtration, drying, vacuum system, condensers, hoppers, dust collectors, scrubber and related equipment. Upon arrival at the emission unit, I was informed by Mike Harding, DC Manufacturing Engineer, that the process had been shutdown for the last month and was expected to startup next week. As a result, I decided to postpone my inspection of the facility until the process is up and running.

NAME Jennifer Long DATE 4/16/14 SUPERVISOR C. Hare

Lang, Jennifer (DEQ)

From: steve.moser@dowcorning.com
Sent: Wednesday, April 09, 2014 5:37 PM
To: Lang, Jennifer (DEQ)
Cc: mike.gruber@dowcorning.com
Subject: RE: 3-19-14 Inspection Follow Up
Attachments: DC006091 - DC006093 Follow up to 3-19-2014 Inspection.pdf; DC006094 - DC006096 Carbon Drum Weight Tanks 5-508 and 5-509.pdf; DC006097 - DC006099 March 19 Pressure Data_Tanks 5-508 and 5-509.pdf

Jennifer,

Attached is the information you requested, with one exception. We will present the block flow diagram/written description for tank no. 153 at the meeting tomorrow, April 10. My apologies for not getting this material to you sooner. Thank you for your patience and understanding.

Stephen V. Moser
Assistant General Counsel
Dow Corning Corporation
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From: Lang, Jennifer (DEQ) [mailto:LANGJ1@michigan.gov]
Sent: Wednesday, April 09, 2014 10:13 AM
To: GRUBER, MICHAEL E. (MEGRUBER); MOSER, STEPHEN V. (SVMOSER)
Subject: 3-19-14 Inspection Follow Up

Mike & Steve,

If possible, I'd like to begin our inspection tomorrow by wrapping up the items listed in the attached document from the inspection on 3/19/14. Once I have this information, I'll be able to close out the inspection report and send you a copy.

Thanks

Jennifer Lang, P.E.
Environmental Engineer Specialist
MDEQ - Air Quality Division
989-894-6216 (office)
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langj1@michigan.gov

7 of 19

Wrap up items from inspection on 3/19/14

EU502-01 (502 chlorosiliane distillation mfg. process)

1. 12-month rolling total VOC emissions through January 2014. (SC I.2 & VI.1)

VOC Emissions (12-month rolling total as of end of January 2014): 0.66 TPY (1,328.3 lbs/yr)

2. Design capacity, material stored and vapor pressure for the following vessels. (SC VI.2, VII.4 & IX.2)

- DV100
- DV102
- DV106
- DV150
- DV151
- DV154
- DV159
- DV256
- DV25-100
- DV25-101

Tank #	Tank Capacities (Gals.)	Chemicals Stored	Volatile Organic Liquid Vapor Pressure (PSIA)
DV100	40,000	Methyltrichlorosilane	3.25
DV102	60,000	Methyldichlorosilane	8.16
DV106	NA	Tetrachlorosilane	NA (Not a VOL)
DV150	20,000	Dimethylchlorosilane	10.18
DV151	20,000	Dimethyldichlorosilane	2.78
DV154	NA	Tetrachlorosilane	NA (Not a VOL)
DV159	NA	Tetrachlorosilane	NA (Not a VOL)
DV256	20,000	Hazardous Waste	1.13
DV25-100	60,000	Trimethychlorosilane	5.46
DV25-101	60,000	Hazardous Waste	4.56

EU502-07 (TCS distillation equipment for purifying TCS into various grades of TCS product)

1. Block flow diagram or written description of vent scenarios for tank no. 153.

Information to be presented at 4/11/2014 inspection meeting.

2. Total number of hours during the 12-month rolling time period through January 2014 that tank no. 153 has been filled with chlorosilanes while 304 vent recovery system is not installed and operating properly. (SC VI.1.b & IX.2)

Total hours that tank no. 153 has been filled with chlorosilanes while 304 vent recovery system is not installed and operating properly (February 2013 through January 2014) = 0.0

3. 12-month rolling total TCS and tetratrichlorosilane emissions through January 2014. (SC I.1 & VI.2)

TCS and STC Emissions (12-month total as of end of January 2014): 0.021 TPY (42.1 lbs/yr)

4. Design capacity, material stored and vapor pressure for the following vessels. (SC VI.3, VII.4 & IX.4)

- DV153
- DV155
- DV252
- DV25-102
- DV25-105
- DV25-107

Tank #	Tank Capacities (Gals.)	Chemicals Stored	Volatile Organic Liquid Vapor Pressure (PSIA)
DV153	NA	Trichlorosilane	NA (Not a VOL)
DV155	NA	Trichlorosilane	NA (Not a VOL)
DV252	NA	Trichlorosilane	NA (Not a VOL)
DV25-102	NA	Trichlorosilane	NA (Not a VOL)
DV25-105	NA	Trichlorosilane	NA (Not a VOL)
DV25-107	NA	Trichlorosilane	NA (Not a VOL)

<u>EU505-01 (resin & coating mfg.)</u>

1. 12-month rolling total VOC emissions through January 2014. (SC I.2 & VI.4)

VOC Emissions (12-month rolling total as of end of January 2014): 1.95 TPY (3,901 lbs/yr)

2. Carbon drum monthly weight records presented during inspection. (SC VI.6)

Attached (Bates-stamped DC 006094 - DC 006096).

3. Additional information requested in emails (2) dated 3/24/14 at 4:06 and 4:28 pm. Information request pertains to pressure monitoring for tank nos. 5-508 and 5-509 and the associated carbon control system.

A. 15-minute data for tank nos. 5-508 and 5-509 on 3/19/14 and respective alarm setpoints:

Attached (Bates-stamped DC 006097 - DC 006099).

B. Also, according to an OLD MACT semi-annual compliance report received by the AQD on 9/16/08 for reporting period 1/1/08 through 6/30/08, as of 10/1/08, DC plans to change the carbon control system from totes and drums in series to only totes. However, during the inspection, I was informed that it was a tote and drum in series for each tank. Could you verify the control setup for me?

There is a tote followed by a drum.

C. Condition no. IX.2 of table EU505-01 of the ROP states, for storage tank nos. 5-508 and 5-509, DC shall replace the activated carbon for the tanks within 3 days after breakthrough of the carbon tote is detected in the carbon drum. Can you provide me with the breakthrough detection dates for 2013 and 2014, as well as when the carbon was replaced?

Toluene tank (5-508)

Date of Carbon Drum/Tote Breakthrough	Date of Carbon Drum/Tote Replacement	Comments
6/13/2013	6/13/2013	
7/3/2013	7/3/2013	
1/12/2014	1/12/2014	

Xylene tank (5-509)

Date of Carbon Drum/Tote Breakthrough	Date of Carbon Drum/Tote Replacement	Comments
	9/14/2013	New drum placed in service, but not due to weight gain/breakthrough

		Toluene tank (5-508)	Xylene tank (5-509)
Hi pressure SPA (alarm setpoint)		8" H2O column	8" H2O column
Lo pressure SPA (alarm setpoint)		1" H2O column	1" H2O column
Date	Time	508 tank blanket pressure (inches H2O column)	509 tank blanket pressure (inches H2O column)
3/19/2014	12:00:00 AM	2.0	2.1
3/19/2014	12:15:00 AM	2.0	2.0
3/19/2014	12:30:00 AM	2.0	2.0
3/19/2014	12:45:00 AM	2.0	1.9
3/19/2014	1:00:00 AM	2.0	2.0
3/19/2014	1:15:00 AM	2.0	2.1
3/19/2014	1:30:00 AM	2.0	2.0
3/19/2014	1:45:00 AM	2.0	2.0
3/19/2014	2:00:00 AM	2.0	1.9
3/19/2014	2:15:00 AM	2.2	2.3
3/19/2014	2:30:00 AM	2.6	2.8
3/19/2014	2:45:00 AM	2.6	2.8
3/19/2014	3:00:00 AM	2.5	2.3
3/19/2014	3:15:00 AM	2.2	1.9
3/19/2014	3:30:00 AM	2.5	2.4
3/19/2014	3:45:00 AM	2.6	2.7
3/19/2014	4:00:00 AM	2.1	2.0
3/19/2014	4:15:00 AM	2.2	2.0
3/19/2014	4:30:00 AM	2.1	2.2
3/19/2014	4:45:00 AM	2.1	2.2
3/19/2014	5:00:00 AM	2.0	2.3
3/19/2014	5:15:00 AM	2.0	2.0
3/19/2014	5:30:00 AM	2.1	2.1
3/19/2014	5:45:00 AM	2.0	2.1
3/19/2014	6:00:00 AM	2.0	2.2
3/19/2014	6:15:00 AM	2.0	2.1
3/19/2014	6:30:00 AM	2.0	2.2
3/19/2014	6:45:00 AM	2.0	2.3
3/19/2014	7:00:00 AM	2.1	2.2
3/19/2014	7:15:00 AM	2.2	2.4
3/19/2014	7:30:00 AM	2.0	2.1
3/19/2014	7:45:00 AM	2.0	2.2
3/19/2014	8:00:00 AM	2.0	2.0
3/19/2014	8:15:00 AM	2.0	2.2
3/19/2014	8:30:00 AM	2.0	2.3
3/19/2014	8:45:00 AM	2.1	2.2
3/19/2014	9:00:00 AM	2.1	1.9
3/19/2014	9:15:00 AM	2.1	2.1
3/19/2014	9:30:00 AM	2.2	2.3

		Toluene tank (5-508)	Xylene tank (5-509)
Hi pressure SPA (alarm setpoint)		8" H2O column	8" H2O column
Lo pressure SPA (alarm setpoint)		1" H2O column	1" H2O column
Date	Time	508 tank blanket pressure (inches H2O column)	509 tank blanket pressure (inches H2O column)
3/19/2014	9:45:00 AM	2.2	2.4
3/19/2014	10:00:00 AM	2.2	1.9
3/19/2014	10:15:00 AM	2.6	2.7
3/19/2014	10:30:00 AM	2.8	3.0
3/19/2014	10:45:00 AM	2.3	2.3
3/19/2014	11:00:00 AM	2.4	2.6
3/19/2014	11:15:00 AM	2.4	2.6
3/19/2014	11:30:00 AM	2.2	2.2
3/19/2014	11:45:00 AM	2.0	2.4
3/19/2014	12:00:00 PM	2.1	2.2
3/19/2014	12:15:00 PM	2.1	2.5
3/19/2014	12:30:00 PM	2.2	2.8
3/19/2014	12:45:00 PM	2.4	2.3
3/19/2014	1:00:00 PM	2.9	2.7
3/19/2014	1:15:00 PM	3.4	3.2
3/19/2014	1:30:00 PM	3.6	2.9
3/19/2014	1:45:00 PM	3.7	3.2
3/19/2014	2:00:00 PM	3.2	3.4
3/19/2014	2:15:00 PM	2.9	2.7
3/19/2014	2:30:00 PM	2.6	2.7
3/19/2014	2:45:00 PM	2.2	2.3
3/19/2014	3:00:00 PM	2.0	2.1
3/19/2014	3:15:00 PM	2.0	2.0
3/19/2014	3:30:00 PM	2.0	2.0
3/19/2014	3:45:00 PM	2.1	2.0
3/19/2014	4:00:00 PM	2.0	2.0
3/19/2014	4:15:00 PM	2.0	2.0
3/19/2014	4:30:00 PM	2.0	2.0
3/19/2014	4:45:00 PM	2.0	2.0
3/19/2014	5:00:00 PM	2.0	1.9
3/19/2014	5:15:00 PM	1.9	2.1
3/19/2014	5:30:00 PM	2.0	2.0
3/19/2014	5:45:00 PM	2.0	1.9
3/19/2014	6:00:00 PM	2.0	2.1
3/19/2014	6:15:00 PM	1.9	2.1
3/19/2014	6:30:00 PM	2.0	2.0
3/19/2014	6:45:00 PM	2.0	2.0
3/19/2014	7:00:00 PM	2.0	2.0
3/19/2014	7:15:00 PM	2.0	2.0

		Toluene tank (5-508)	Xylene tank (5-509)
Hi pressure SPA (alarm setpoint)		8" H2O column	8" H2O column
Lo pressure SPA (alarm setpoint)		1" H2O column	1" H2O column
Date	Time	508 tank blanket pressure (inches H2O column)	509 tank blanket pressure (inches H2O column)
3/19/2014	7:30:00 PM	2.0	2.1
3/19/2014	7:45:00 PM	2.0	1.9
3/19/2014	8:00:00 PM	2.0	2.0
3/19/2014	8:15:00 PM	2.0	2.0
3/19/2014	8:30:00 PM	2.0	2.0
3/19/2014	8:45:00 PM	2.0	2.0
3/19/2014	9:00:00 PM	2.0	2.0
3/19/2014	9:15:00 PM	2.0	2.0
3/19/2014	9:30:00 PM	2.0	2.0
3/19/2014	9:45:00 PM	2.0	2.0
3/19/2014	10:00:00 PM	2.0	2.0
3/19/2014	10:15:00 PM	2.0	2.0
3/19/2014	10:30:00 PM	2.0	2.0
3/19/2014	10:45:00 PM	2.0	2.0
3/19/2014	11:00:00 PM	2.0	2.0
3/19/2014	11:15:00 PM	2.0	2.1
3/19/2014	11:30:00 PM	2.0	2.1
3/19/2014	11:45:00 PM	2.0	2.0
3/20/2014	12:00:00 AM	2.0	2.0

~~Do Cumming~~ FINAL

5-508 & 5-509 Carbon Absorber Inspection Log

Bldg. 505 Month Jan Year 2014

Tank: **5-508**

	1 Date	2 Time	3 Initials	4 Proper valving	5 Hose connections and piping	6 Comments
Week 1						
Week 2	1/14	0900	KK	✓	✓	
Week 3	1/20	2300	BS	✓	✓	
Week 4	1/31	1445	JV	✓	✓	
Week 5						

Beginning carbon drum weight: 148.7
End carbon drum weight: 151.8
Date carbon drum weighed: 1-31-14

Beginning carbon tote weight: ~~2460~~ 2200 lbs
End carbon tote weight: 965.1 Kg
Date carbon tote weighted: 2/3

Did carbon drum gain weight? (Y) N

If yes:
Date carbon tote and drum replaced: 2/3/14
Beginning carbon drum weight:

Tank: **5-509**

	1 Date	2 Time	3 Initials	4 Proper valving	5 Hose connections and piping	6 Comments
Week 1						
Week 2	1/14	0900	KK	✓	✓	
Week 3	1/20	2300	BS	✓	✓	
Week 4	1/31	1445	JV	✓	✓	
Week 5						

Beginning carbon drum weight: 160
End carbon drum weight: 160.9
Date carbon drum weighed: 1-31-14

Beginning carbon tote weight: 2100 lbs
End carbon tote weight: 957.2 Kg
Date carbon tote weighted: 2/3

Did carbon drum gain weight? (Y) N

If yes:
Date carbon tote and drum replaced: 2/5/14
Beginning carbon drum weight:

NOTE** Carbon totes are not in SAP, need to contact 501 at 496-6917 and ask them to send one. Carbon drums are in SAP Material# 3320260, need to contact 2602 bldg to obtain them.

~~Dow Corning~~ ~~MSD~~

5-508 & 5-509 Carbon Absorber Inspection Log

Bldg. 505 Month Feb Year 2014

Tank: **5-508**

	1	2	3	4	5	6
	Date	Time	Initials	Proper valving	Hose connections and piping	Comments
Week 1	2/3	1845	CS	✓	✓	
Week 2	2/10	2030	DC	✓	✓	
Week 3	2/18	2200	DC	✓	✓	
Week 4	2/24	2030	DC	✓	✓	
Week 5						

Beginning carbon drum weight: 2/3/14 ~~116.2~~ 119.4 - forgot to weigh with fittings. NO pallet

End carbon drum weight: ~~119.4~~

Date carbon drum weighed: 3/2

Beginning carbon tote weight: 976 Kg

End carbon tote weight: _____

Date carbon tote weighted: _____

Did carbon drum gain weight? (Y) N

Snow Buildup on Drum. Less than 1lb. gained.

If yes:

Date carbon tote and drum replaced: _____

Beginning carbon drum weight: _____

Tank: **5-509**

	1	2	3	4	5	6
	Date	Time	Initials	Proper valving	Hose connections and piping	Comments
Week 1	2/3	1845	CS	✓	✓	
Week 2	2/10	2030	DC	✓	✓	
Week 3	2/18	2200	DC	✓	✓	
Week 4	2/24	2030	DC	✓	✓	
Week 5						

Beginning carbon drum weight: 2/3 126.1 - NO pallet

End carbon drum weight: 126.4

Date carbon drum weighed: 3/2

Beginning carbon tote weight: 969.9

End carbon tote weight: _____

Date carbon tote weighted: _____

Did carbon drum gain weight? (Y) N

SNOW buildup

If yes:

Date carbon tote and drum replaced: _____

Beginning carbon drum weight: _____

NOTE** Carbon totes are not in SAP, need to contact 501 at 496-6917 and ask them to send one. Carbon drums are in SAP Material# 3320260, need to contact 2602 bldg to obtain them.

5-508 & 5-509 Carbon Absorber Inspection Log

Bldg. 505 Month March Year 2014

Tank: **5-508**

	1	2	3	4	5	6
	Date	Time	Initials	Proper valving	Hose connections and piping	Comments
Week 1	3/3	1945	CS	✓	✓	
Week 2	[illegible]	[illegible]	[illegible]	✓	✓	
Week 3	3/17	0530	CS	✓	✓	
Week 4						
Week 5						

Beginning carbon drum weight: 119.4
End carbon drum weight: _____
Date carbon drum weighed: _____

Beginning carbon tote weight: 976
End carbon tote weight: _____
Date carbon tote weighted: _____

Did carbon drum gain weight? Y N

If yes:
Date carbon tote and drum replaced: _____
Beginning carbon drum weight: _____

Tank: **5-509**

	1	2	3	4	5	6
	Date	Time	Initials	Proper valving	Hose connections and piping	Comments
Week 1	3/3	1945	CS	✓	✓	
Week 2	[illegible]	[illegible]	[illegible]	✓	✓	
Week 3	3/17	0530	CS	✓	✓	
Week 4						
Week 5						

Beginning carbon drum weight: 126.1
End carbon drum weight: _____
Date carbon drum weighed: _____

Beginning carbon tote weight: 969.9
End carbon tote weight: _____
Date carbon tote weighted: _____

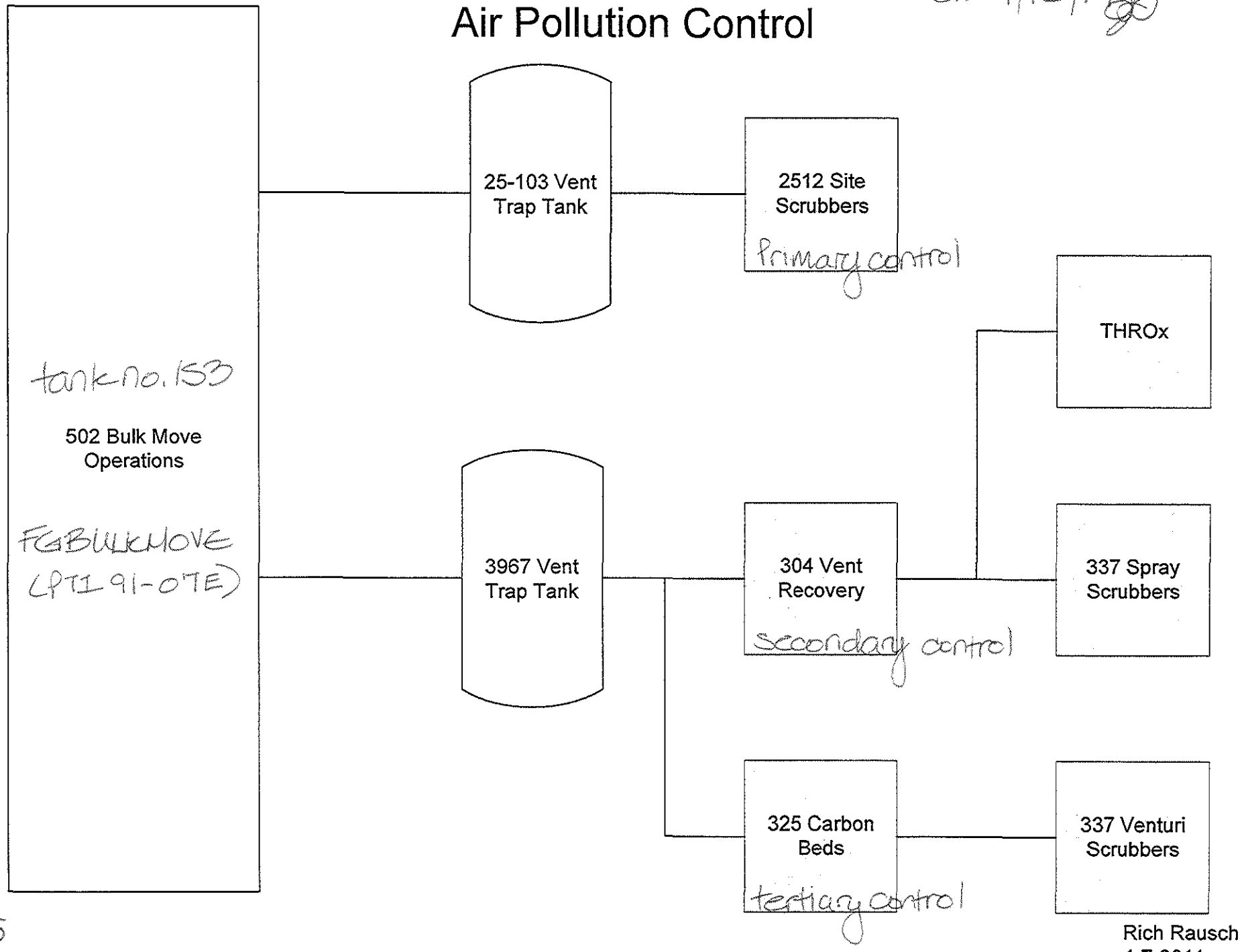
Did carbon drum gain weight? Y N

If yes:
Date carbon tote and drum replaced: _____
Beginning carbon drum weight: _____

NOTE* *Carbon totes are not in SAP, need to contact 501 at 496-6917 and ask them to send one. Carbon drums are in SAP Material# 3320260, need to contact 2602 bldg to obtain them.*

RCV'D BY MDEQ-AQD on 4/10/14 gd

502 Bulk Move
Air Pollution Control



Rich Rausch
4-7-2011

DC 006102

General Process Description:

EU502-07

This emission unit consists of three Electronic Grade Trichlorosilane (EG TCS) distillation trains and the associated feed, intermediate and product storage tanks. The first step in the distillation process is a crude separation of trichlorosilane (TCS) from silicon tetrachloride (STC). The first column is fed by T-153 which holds crude TCS. The TCS separated in the first step is sent to an intermediate storage tank T-155 before downstream distillation provides further purification by removing low level contaminants and separation into various grades: Electrical Grade (EG), Chemical Grade (CG) and Plant Grade (PG). The EG TCS product is cooled, condensed and sent to tanks T25-105, T25-107 and T25-109 in the 2500 block tank farm. The CG TCS by-product is cooled, condensed and sent to T25-102 in the 2500 block tank farm. The PG TCS is cooled, condensed and sent to T-252 in the 500 block tank farm. Products and by-products are stored in these tanks until they are loaded into railcars and tank trucks or off-site use. Vents from the TCS distillation/purification process and chlorosilane bulk loading/unloading operations undergo chlorosilane removal before venting to the atmosphere. This emission unit vents to both the 304 vent recovery system and the 337 wet scrubber or THROX in series. In the event 304 vent recovery goes down, the emission unit vents to the air pollution control (APC) train described in FG325-01. This APC train is comprised of a carbon bed and scrubber system which operate in series to control emissions.

EU502-01

The TCS Distillation Train consists of two chlorosilane feed tanks and a series of distillation columns to separate trichlorosilanes (TCS) from silicon tetrachloride (STC). The chlorosilanes are condensed and sent to product tanks in the 500 and 2500 block tank farms. Chlorosilanes from the storage tanks are loaded into railcar stations and trailer cars for off-site use.

Vents from the TCS distillation/purification process and chlorosilane bulk loading/unloading operations undergo chlorosilane removal before venting to the atmosphere. This emission unit vents to both the 304 vent recovery system and the 337 wet scrubber or THROX in series. In the event 304 vent recovery goes down, the emission unit vents to the air pollution control (APC) train described in FG325-01. This APC train is comprised of a carbon bed and scrubber system which operate in series to control emissions.

FGBULKMOVE

The bulk move operations from TCS distillation include: storage tank loading/unloading and railcar and trailer operations. These operations are currently permitted as ancillary equipment under EU502-01, EU502-07 and FGRULE290 of MI-ROP-A4043-2008. The vents from these operations are currently routed to 304 Vent Recovery then to the THROX or 337 Scrubbers. These lines contain chlorosilanes with no HAPS. It is found when chlorosilanes are burned in the THROX, HCl and SiO_2 are created. The HCl causes internal corrosion and the SiO_2 is a source of particulate emissions. As part of a THROX reliability project, these operations will be routed directly to the site scrubbers, FGSITESCRUBBERS. In the event FGSITESCRUBBERS is inoperable, vents from these bulk move operations may be routed to the control scheme of EU502-01 and EU502-07.

TRAILER and RAIL STATIONS: The 502 area has multiple tank trailer and railcar loading and unloading stations. Many stations have multiple uses and therefore have multiple vent header connections. The operators loading and unloading railcars and tank trucks choose the appropriate vent header depending on the transfer being made. Moves involving TCS and STC will be directed to the TCS Bulk Move Vent header. Moves involving methyl chlorosilanes will be directed to the Methyl Bulk Move Vent header. Moves involving

RCVD By MDEQAQD on 4/10/14

hazardous waste or any other moves requiring HAP destruction will be directed to the Hazardous Waste Vent header. See Table 1 for a detailed listing of which transfer operations are performed at the various stations. Enclosure 2: Process Diagram shows the locations of the stations.