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

B430364746

FACILITY: Honeywell International (Burdick & Jackson)		**SRN / ID:** B4303
LOCATION: 1953 South Harvey Street, MUSKEGON		**DISTRICT:** Grand Rapids
CITY: MUSKEGON		**COUNTY:** MUSKEGON
CONTACT: Andy Garceau , EH Manager		**ACTIVITY DATE:** 08/18/2022
STAFF: Scott Evans	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** SM OPT OUT
SUBJECT: On-site inspection to assess compliance with permit requirements and air quality rules and regulations.		
RESOLVED COMPLAINTS:		

Introduction

On August 18, 2022, State of Michigan Department of Environment, Great Lakes, and Energy Air Quality Division (AQD) staff member Scott Evans (SE) conducted an unannounced, on-site inspection of the Honeywell International facility located at 1953 South Harvey St. in Muskegon, Michigan, to assess compliance with all applicable permit requirements and air quality rules and regulations. This facility currently has five active air quality Permits to Install (PTI): PTI Nos. 554-80, 26-88, 833-91, 284-93, and 76-05C. Honeywell is classified as an opt-out source for emissions of Volatile Organic Compounds (VOCs) and Hazardous Air Pollutants (HAPs).

Honeywell International is a manufacturer of solvent chemicals. The production of these materials is accomplished through various reaction and distillation processes conducted in large tanks as needed. These processes include mixing chemicals or purifying them for uses requiring specific materials such as laboratory or medical use. The final products are placed in appropriate containers and packaged for shipping.

Upon arrival, SE conducted a view of the site perimeter, during which no odors or visible emissions (VEs) were observed. After completing this perimeter inspection, SE entered the facility and was greeted by Andy Garceau (AG). After a brief discussion to discuss the purpose of the day's visit, an inspection of the facility interior was conducted, during which all distilling, reaction, bottling, and packaging rooms were visited as well as the boiler room, thermal oxidizer room, truck loading and unloading platform, and facility roof.

PTI No. 554-80

PTI No. 554-80 was issued on August 4, 1981. It appears to be a modification of a permit by the same PTI No. that was issued in October of 1980, after a discussion between facility and state regulatory staff concluded that a change to facility operations required permit alterations that would not significantly alter emissions. The permit includes conditions applied to the bulk solvent tank farm located at the facility, which includes six 9,900-gallon tanks.

Special Condition (SC) 10 states that VEs from these tanks cannot exceed 20% opacity "except as specified in Rule 301(1a) and (b)." During the inspection no visible emissions from any tank were observed. This is compliant with the 20% opacity limit and so the exceptions allowed are not currently relevant. The facility discussed that this was normal for standard facility operations as the tanks are closed tanks with vacuum systems to reclaim any vapors resulting from filling and emptying of the tanks.

SC11 states that VOC emissions from these tanks may not exceed 135 lbs./hr or 1.1 tons per year (tpy). During the on-site inspection it was confirmed that records of this are kept by the facility. A

copy of these records was provided to the AQD digitally for a more detailed review. Review of these records found that the highest monthly VOC emissions from July 2021 to June 2022 from these tanks was 31 lbs./mo, which is less than the permitted hourly rate of 135 lbs./hr and demonstrates compliance with the limit. In that time frame the highest annual emission rate was 241 lbs. from January 2021 to December 2021. This is in compliance with the permitted limits.

SC12 states that no chemicals other than those specified in the permit application may be stored in the tanks at any time. This permitted list of chemicals includes Methylene chloride, tetrahydrofuran, chloroform, heptane, acetonitrile, and nonchlorinated wastes. It was discussed during the inspection that no chemicals other than these listed are stored in the tanks. This is compliant with the permit condition.

PTI No. 26-88

PTI No. 26-88 was first approved on January 25, 1988 for the installation of twelve 9,900-gallon storage tanks. The permit was modified on February 10, 1988 to correct an error in one of the special conditions within the permit.

SC14 states that there may not be any VEs from any of the tanks. During the inspection it could be seen that no VEs were emitting from these tanks. As with other tanks, these are closed with vacuum recapture systems to prevent vapor release. Discussions with the facility representatives confirmed that this is standard for operation of the tanks. This is compliant with the requirement.

SC15 states that the tanks may not emit more than 4 tpy of VOCs. During the on-site inspection it was confirmed that records of this are kept by the facility. A copy of these records was provided to the AQD digitally for a more detailed review. Review of these records found that the highest annual emission rate was 0.69 tons from October 2020 to September 2021. This is in compliance with the permitted limits.

SC16 states that the tanks may only be used if the conservation vents for each tank are installed and working properly. During the inspection, the vents were observed and were operating properly. Discussions confirmed that there had been no issues with the vents since the last visit by the AQD. This is compliant with the requirement.

SC17 states that compound shipment records must be maintained and kept on site for at least two years. During the on-site inspection it was confirmed that records of this are kept by the facility. A copy of these records can be provided upon request, however, copies were not retained at this time to help limit the size of this report and the extensive records required to accompany it.

SC18 states that the facility may only store materials discussed in the permit application unless the change does not significantly increase emissions and has been discussed with the AQD. The discussed list of chemicals is as follows:

- Acetone
- Acetonitrile
- Dimethyl formamide
- Ethyl acetate
- Ethyl Ether
- Heptane

- Hexane
- Methyl t-butyl ether
- Methyl Isoamyl Ketone
- Pentane
- Petroleum Ether
- N-propyl alcohol
- Isopropyl alcohol
- Tetrahydrofuran
- Toluene
- 1,1,2-trichloro trifluoroethane

It was discussed during the inspection that no chemicals other than these listed are stored in the tanks. As with many other parts of the operations in this facility, repurposing of tanks would require extensive cleaning and decontamination operations, making it highly impractical. As such, the facility keeps very clear and detailed lists of what may be in any specific tank that are attached to each tank. This is compliant with the permit condition.

PTI No. 833-91

PTI No. 833-91 was issued on December 2, 1991. It covers a thermal oxidizer unit as well as on-site bottle washing equipment.

SC14 states that there may not be any VEs from the bottle washer or thermal oxidizer. During the inspection it could be seen that no VEs were emitting from the equipment. Discussions with the facility representatives confirmed that this is standard for operation of the tanks. This is compliant with the requirement.

SC15 states that the system may not operate unless the thermal oxidizer has been preheated to operating temperatures prior to use. During the inspection it was discussed that the unit is preheated to and operated at approximately 1,335°F as is specified in manufacturer specifications. It could be seen that the unit was operating at this temperature during the inspection. The facility keeps circular dial records of temperatures that were reviewed on site and can be provided upon request if ever needed. The one currently present showed a consistent line holding at approximately 1350°F with only one dip that corresponded with a machine shutdown for routine maintenance. This is compliant with the requirement.

SC16 states that exhaust from the unit must be discharged through a stack that is no more than 24” in diameter and no less than 40’ above ground level. During the inspection, a stack was observed to service the equipment. Height and diameter were not directly measured for safety reasons, but observation appears to confirm compliance with the requirement.

SC17 states that VOC emissions from this equipment may not exceed 0.82 lbs./hr or 3.0 tpy. During the on-site inspection it was confirmed that records of this are kept by the facility. A copy of these records was provided to the AQD digitally for a more detailed review. Review of these records along with discussion of washing procedures found that the bottles are washed with minimal amounts of diluted acetone resulting in VOC emissions low enough that rounding shows zero VOC emissions from this source. This appears accurate based on discussion and observations and no additional testing is required at this time.

SC18 states that the facility may only use raw materials discussed in the permit application unless the change does not significantly increase emissions and has been discussed with the AQD. The only mentioned raw material in the application is acetone. Discussion with the facility confirmed that only acetone is used in the process as a raw material. This is compliant with the permit requirement.

SC19 states that the facility is required to maintain and follow a copy of the manufacturer specified preventative maintenance plan for thermal oxidizing unit. During the inspection, a copy of this plan was observed on site and discussion confirmed that it is presently in use. This is compliant with the permitted requirement.

PTI No. 284-93
PTI No. 284-93 was approved on May 24, 1993 as an amendment to PTI No. 554-80 for the replacement of one 9,900 gallon storage tank for one 8,000 gallon storage tank.

SC 15 states that no VEs may emit from the storage tank. During the inspection, no VEs were observed emitting from this tank. This is compliant with the permitted requirement.

PTI No. 76-05C
PTI No. 76-05C is a modified version of PTI No. 76-05, which was first approved on December 11, 2013. PTI No. 76-05C was approved on August 4, 2020. This permit includes all permitted equipment not discussed in any of the other PTIs discussed above. For a detailed list of permitted emission units, please refer to the list provided in the permit that is stored with the AQD file. This list is not included in this report for brevity. There are other chemicals and processes that are not included within the scope of this permit as they are used under permitting exemption rules. These chemicals are discussed later in this report.

<u>EUBLENDING</u>
EUBLENDING is an Emission Unit (EU) consisting of two mixing processes. One process occurs in material shipping containers with emissions controlled by a snorkel system that vents through a stack. The other process occurs in a 300-gallon tank that is vented to a waste tank with gaseous waste released through a stack.

The following table outlines the emission limits and compliance evaluation as determined by review of provided records:

Pollutant	Limit	Time Period /	Equipment	Actual Emissions (Max)	Compliant?
1. VOC	2.6 tpy	12-month rolling time period as determined	EUBLENDING	0.02 tpy	Yes
2. Chloroform	10 lb/month	Monthly Basis	EUBLENDING	0 lbs./mo	Yes
3. 1,4 dioxane	10 lb/month	Monthly Basis	EUBLENDING	0 lbs./mo	Yes
4. methylene chloride	10 lb/month	Monthly Basis	EUBLENDING	1.36 lbs./mo	Yes
5. tetrahydrofuran	10 lb/month	Monthly Basis	EUBLENDING	0 lbs./mo	Yes
6. trichloroethylene	10 lb/month	Monthly Basis	EUBLENDING	0 lbs./mo	Yes
7. triethylamine	10 lb/month	Monthly Basis	EUBLENDING	0 lbs./mo	Yes

The facility maintains records appropriate for confirming compliance with these limits. This is discussed later in this report.

The following table summarizes the material limits associated with this EU as well as the compliance determination made with provided records:

Material	Limit	Time Period /	Equipment	Recorded Value (Max)	Compliant?
1. High Purity Blends	150,000 liters per year	12-month rolling time period as determined at the end of each calendar month	HP I (shipping containers)	42,398 liters per year	Yes
2. High Purity Blends	300,000 liters per year	12-month rolling time period as determined at	HP II (300 gallon mix tank)	2,509 liters per year	Yes

		the end of each calendar month.			
3. Chloroform	12 batches per month	Monthly basis	EUBLENDING	0	Yes
4. 1,4 dioxane	31 batches per month	Monthly basis	EUBLENDING	0	Yes
5. methylene chloride	6 batches per month	Monthly basis	EUBLENDING	2	Yes
6. tetrahydrofuran	23 batches per month	Monthly basis	EUBLENDING	0	Yes
7. trichloroethylene	28 batches per month	Monthly basis	EUBLENDING	0	Yes
8. triethylamine	31 batches per month	Monthly basis	EUBLENDING	0	Yes

The facility maintains records appropriate for confirming compliance with these limits. This is discussed later in this report.

This EU has one process limit, which states that no more than 100 liters per batch be processed when chloroform, 1,4-dioxane, methylene chloride, tetrahydrofuran, trichloroethylene, or triethylamine is used. The facility maintains records appropriate for confirming compliance with these limits. This is discussed below.

This EU has the following record keeping requirements:

- Record of the number of liters processed in the EU on a monthly and 12 month rolling time period basis as determined at the end of each calendar month must be kept.
- Record of the number and size (in liters) of batches processed in the EU containing chloroform, 1,4-dioxane, methylene chloride, tetrahydrofuran, trichloroethylene or triethylamine.
- Record of all batches processed in the EU including the chemicals used, weights and volumes processed, and batch run times.
- Record of VOC emissions from EU on a monthly and 12-month rolling time period basis as determined at the end of each calendar month.

These records were observed on-site and confirmed to be present in an appropriate format. Copies of these records were sent to the AQD digitally at a later date for a detailed review. In the tables above an analysis of compliance with emission and material limits based on what is shown in these records can be seen. These records show that only two batches containing methylene chloride were produced and that all other specifically mentioned chemicals were not blended from July 2021 to June 2022.

This EU has two associated stacks with the following size requirements:

- One may not be more than 1” in diameter and must be 32.5’ above ground.
- One may not be more than 6” in diameter and must be 40.2’ above ground.

Neither stack was measured directly for safety purposes, but visual inspection appeared to confirm that each stack was connected to the proper mixing station and was meeting size requirements.

EUR-3REACTOR

This EU consists of a 300 gallon batch treatment reactor.

This EU has two VOC emission limits as follows:

- 6.0 lbs. per batch of VOCs emitted.
- 0.05 tpy per 12-month rolling time period of VOCs emitted.

Compliance with these limits is discussed below with record keeping requirements.

This EU has one process restriction, which states that chloroform, dioxane, or ethylene dichloride may not be processed in this unit. Discussions confirmed that these chemicals are not run through this reactor.

This EU must have the following records maintained for its operations:

- Record of the chemicals used, weights and volumes processed, and batch run times for each batch must be maintained.
- Record of monthly and 12-month rolling time period VOC emissions must be maintained.

These records were observed on-site and confirmed to be present in an appropriate format. Copies of these records were sent to the AQD digitally at a later date for a detailed review. The following analyses were determined from this detailed review:

- Batch data was provided. For brevity, it is not reiterated here but a copy of the records is attached to this report for detailed review.
- The following VOC data was provided:
    - The highest monthly VOC emissions were 3.29 lbs. in May of 2022.
    - The highest 12 month rolling annual VOC emissions were 11.6 lbs. from July 2021 to June 2022

These records show that the facility is compliant with all emission limit and record keeping requirements.

EUR-7REACTOR

This EU consists of a 750 gallon batch treatment reactor.

The table below is a summary of the emission limits associated with this EU:

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Recorded Value (Max)	Compliant?
1. Ethylene dichloride	20 batches	12-month rolling time period as determined at the end of each calendar month.	EUR-7REACTOR	0 batches	Yes
2. Ethylene Dichloride	133 lbs per year	12-month rolling time period as determined at the end of each calendar month.	EUR-7REACTOR	0 lbs. per year	Yes
3. 1,4-dioxane	4 batchs per month (30 batches per year)	12-month rolling time period as determined at the end of each calendar month	EUR-7REACTOR	1 batch	Yes
4. 1,4-dioxane	30 lbs per year	12-month rolling time period as determined at the end of each calendar month.	EUR-7REACTOR	0.00 lbs. per year (rounded)	Yes
5. VOC	0.38 tpy	12-month rolling time period as determined	EUR-7REACTOR	0.09 tpy	Yes

The facility provided appropriate records for the above summary, which is discussed below.

This EU has the following additional process/operational restrictions:

- No Chloroform may be processed in this EU.
- Shall not process more than four batches per month and 30 batches per 12-month rolling time period as determined at the end of each calendar month of 1,4-dioxane.
- Shall not process more than 20 batches per 12-month rolling time period as determined at the end of each calendar month of ethylene dichloride.
- No 1,4-dioxane may be processed unless a residual vacuum charging method is applied to prevent emission release.
- The permittee shall install, maintain, and operate in a satisfactory manner a vapor balance system for any drums used for transfers from the reactor during the processing of ethylene dichloride. The vapor balance system shall include the following:
  - The transfer of liquid to the drum(s) shall be carried out during reactor vessel draining so as to prevent emissions of returned vapor from the reactor vessel during the transfer process.
  - A vapor tight collection line on any drum used that includes a device to ensure that the vapor collection line shall close upon disconnection so as to prevent the release of organic vapors.
  - A device or procedure to accomplish complete drainage before the liquid line is disconnected, or a device or procedure to prevent liquid drainage from the liquid line when not in use.
- The liquid charging/transfer rates to the EU for processing steps used during ethylene dichloride processing, when the process is venting, shall not exceed an hourly average of 3.0 gallons per minute nor a total of 180 gallons for each hour of operation.

Many of these process/operational restrictions have compliance determined through record keeping requirements discussed below. The following assessments could be made without records:

- The facility and records confirmed that no chloroform has been processed in this EU, as is required by the restrictions.
- The residual vacuum recharging method was discussed and appears to comply with the operational restrictions.
- The vapor balance system was in place and appeared to meet all requirements outlined above.

This EU has the following record keeping requirements:

- Monthly transfer rates of ethylene dichloride.
- Monthly and 12 month rolling annual process records of:
  - Batches of ethylene dichloride
  - Batches of 1,4-dioxane
- Batch info as follows:
  - Chemicals used
  - Weights or volumes processed

    - Run times
- Monthly and 12 month rolling emissions for:
    - VOCs
    - Ethylene dichloride
    - 1,4-dioxane

Records for July 2021 to June 2022 were reviewed briefly on site and copies of records were provided to the AQD digitally for a detailed review at a later date. A summary of the records can be seen in the table above as well as the following additional analyses:

- No ethylene dichloride was processed at the facility during this period and, therefore, there were no records of batches or emissions reported.
- 1 batch of 1,4-dioxane was processed in December 2021. 1,4-dioxane emissions for the recorded period were 0.04 lbs./yr, all coming from the single recorded batch.
- VOC emission maximums from this EU were as follows:
    - 38.54 lbs in February 2022
    - 221 lbs/yr from March 2021 to February 2022
- Additional batch data was provided, though each chemical is not reiterated here for brevity.

This EU has one associated stack that is required to be no more than 1" in diameter and no less than 29.5' in height. One stack was observed associated with the EU. It was not directly measured for safety but appeared to meet permitted requirements.

EUR-8REACTOR

This EU consists of a 1000 gallon batch treatment reactor.

This EU has two VOC emission limits as follows:

- 18.7 lbs. per hour of VOCs emitted.
- 0.50 tpy based on a 12-month rolling time period of VOCs emitted.

Compliance with these limits is discussed below with record keeping requirements.

This EU has one process restriction, which states that chloroform, dioxane, or ethylene dichloride may not be processed in this unit. Discussions confirmed that these chemicals are not run through this reactor.

This EU must have the following records maintained for its operations:

- Record of the chemicals used, weights and volumes processed, and batch run times for each batch must be maintained.
- Record of monthly and 12-month rolling time period VOC emissions must be maintained.

These records were observed on-site and confirmed to be present in an appropriate format. Copies of these records were sent to the AQD digitally at a later date for a detailed review. The following analyses were determined from this detailed review:

- Batch data was provided. For brevity, it is not reiterated here but a copy of the records is attached to this report for detailed review.
- The following VOC data was provided:
  - The highest monthly VOC emissions were 10.02 lbs. in September 2021 which is below the hourly limit
  - The highest 12 month rolling annual VOC emissions were 91.8 lbs. per year from July 2021 to June 2022.

These records show that the facility is compliant with all emission limit and record keeping requirements.

This EU has one associated stack that is required to be no more than 1" in diameter and no less than 29.5' in height. One stack was observed associated with the EU. It was not directly measured for safety but appeared to meet permitted requirements.

EUR-9REACTOR

This EU consists of a 750 gallon reactor process.

This EU has three associated emission limits:

- 30 lbs. per year based on a 12-month rolling time period of 1,4-dioxane from the EU
- 0.077 lbs. per hour of 1,4-dioxane from the EU
- 0.38 tpy based on a 12-month rolling time period of VOCs from the EU

Compliance with these limits is assessed later in this report with a discussion of record keeping requirements for this EU.

This EU has the following process/operational limits:

- No more than 4 batches per month or 30 batches per year of 1,4-dioxane may be processed by the EU.
- 1,4-dioxane may only be processed in the EU if a residual vacuum charging method is applied to prevent emission release during recharging.
- This EU may not process chloroform or ethylene dichloride.

Batch number processing compliance is discussed below with recordkeeping requirements. The following compliances were determined during the inspection:

- The residual vacuum charging method was discussed and is compliant with the requirement.
- No chloroform or ethylene dichloride is processed by this unit, as is required.

This EU must have the following records maintained for its operations:

- Monthly and 12-month rolling batch numbers of 1,4-dioxane processed.
- Record of the chemicals used, weights and volumes processed, and batch run times for each batch must be maintained.

- Record of monthly and 12-month rolling time period VOC and 1,4-dioxane emissions must be maintained.

These records were observed on-site and confirmed to be present in an appropriate format. Copies of these records were sent to the AQD digitally at a later date for a detailed review. The following analyses were determined from this detailed review:

- No batches of 1,4-dioxane were processed from July 2021 to June 2022.
- Batch data was provided. For brevity, it is not reiterated here but a copy of the records is attached to this report for detailed review.
- The following VOC data was provided:
  - The highest monthly VOC emissions were 41.07 lbs. in January 2022.
  - The highest 12 month rolling annual VOC emissions were 328.8 lbs. from July 2021 to June 2022.
  - There were no dioxane emissions as no batches were processed.

This EU has one associated stack that is required to be no more than 1” in diameter and no less than 29.5’ in height. One stack was observed associated with the EU. It was not directly measured for safety but appeared to meet permitted requirements.

FGPACKAGING

This flexible group (FG) includes eight packaging areas where liquids are packaged into containers: EUBR1, EUBR2, EUBR3, EUCRET, EUCRWHS, EUPRR5, EUPRR3, and EUMETERS.

The following table summarizes emission limits applied to this FG as well as a summary of compliance found through provided records:

Pollutant	Limit	Time Period/	Equipment	Recorded Actuals (Max)	Compliant?
VOC plus methylene Chloride	27.5 tpy	12-month rolling time period as determined at the end of each calendar month.	FGPACKAGING	1.67 tpy	Yes
Chloroform	1,265 pounds per year			28.89 lbs. per year	Yes
1,4-Dioxane	614 pounds per year			0 lbs. per year	Yes
Ethylene Dichloride	18,000 pounds per year			0 lbs. per year	Yes
Methylene Chloride	375 pounds per year			936 lbs. per year	Yes
Tetrahydrofuran	3,988 pounds per year		EUBR1 and EUBR2 Combined EUBR3, EUPRR5, EUPRR3, and	122.71 lbs. per year	Yes
				199.15 lbs. Per year	Yes

Pyridine	1,979 pounds per day 1,725 lbs/day	Calendar Day	EUMETERS EUCRET and EUCRWHS FGPACKAGING FGPACKAGING	Combined Combined Combined	0 lbs. per day 9.3 lbs. per year 0.64 lbs. per day	Yes Yes Yes

Compliance with the pound per hour emission limits are based on stack testing.

This FG has the following process/operational restrictions:

- No 1,4-dioxane, ethylene dichloride, or pyridine may be packaged in EUMETERS
- No container larger than 20 liters may be filled at EUBR1 and EUBR2
- No decahydronaphthalene or trichloroethylene may be packaged at the EU.
- Waste shall be stored in closed containers and disposed of properly.
- No container larger than 20 liters may be used for ethylene dichloride.
- No chloroform, 1,3-dichloropropene, 1,4-dioxane, ethylene dichloride, triethylamine, or trifluoroacetic acid may be packaged in EUBR3.

Inspection and discussion of procedures with facility representatives as well as review of records as summarized above confirmed compliance with all of the above process/operational restrictions.

The facility is required to use manufacturer's formulation data to determine HAP content of any material used on site. The facility currently is compliant with these requirements as verified by maintained records on site. At this time, it is not necessary for the facility to test and verify any of this data.

The facility has the following record keeping requirements:

- Records must be kept of the manufacturer data of chemical composition of each material, including the weight percent of each component.
- Monthly records of the following must be kept:
  - ID and volume of each packaged material.
  - Vapor pressure, molecular weight, container size(s) used, and packaging location (by listed emission unit) for each material.
  - Monthly and 12 month rolling period emission rates for VOC plus methylene chloride mass emissions.
- Monthly records of the following must be kept:
  - Gallons of Chloroform, 1, 4-Dioxane, Ethylene Dichloride, Methylene Chloride, and Tetrahydrofuran packaged.
  - Monthly and 12 month rolling period emission rates for Chloroform, 1, 4-Dioxane, Ethylene Dichloride, Methylene Chloride, and Tetrahydrofuran.
- Daily records of the following must be kept:
  - Gallons of tetrahydrofuran and pyridine packaged.
  - Tetrahydrofuran and pyridine emission rates.

The facility provided all of the required records above. A copy of the provided records is included with this report and a brief analysis is written below. More detailed compliances with emission limits can be seen in the tables above.

- MSDS records are kept on site for each material used. This was reviewed and the facility is compliant with the record keeping requirement.
- All required daily and monthly records were maintained and provided in compliance with requirements. This is summarized in the table above.

This FG has the following associated stacks:

These stacks were not measured directly for safety reasons. However, each stack was observed, and all appeared to be within required parameters.

FGSTILLS

FGSTILLS is a flexible group consisting of multiple distillation units: EUS-5STILL, EUS-6STILL, EUS-7STILL, EUS-8STILL, EUS-9STILL, EUS-10STILL, EUS-11STILL, EUS-12STILL, EUS-13STILL, and EUS-14STILL. This group also contains multiple condensers.

The table below summarizes the emission limits and compliance status of the associated emission units:

Pollutant	Limit	Time Period	Equipment	Recorded Actuals (Max)	Compliant?
VOC	1.0 tpy (per still listed under equipment)	12-month rolling time period as determined at the end of each calendar month.	EUS-5STILL,	5 lbs. per year	Yes
			EUS-6STILL,	0.23 tpy	Yes
			EUS-7STILL,	0.14 tpy	Yes
			EUS-9STILL	0.32 tpy	Yes
	1.83 tpy		EUS-10STILL	0.19 tpy	Yes
	0.8 tpy		EUS-11STILL	0.28 tpy	Yes
	3.5 tpy		EUS-12STILL	0.02 tpy	Yes
1,4-dioxane	0.86 lb per batch	Batch duration	EUS-8STILL	0 batches produced	Yes
	304 lb per year	12-month rolling time period as determined at the end of each calendar month.		0 lbs. per year	Yes
VOC	1.5 tpy			0.07 tpy	Yes
Chloroform	3.46 lbs per batch	Batch duration		1.61 lbs. per batch	Yes
	1,414 lbs per year	12-month rolling time period as determined at the end of each calendar month.		23 lbs. per year	Yes
Methylene chloride	6.9 lbs per batch	Duration of batch		3.51 lbs. per batch	Yes
	2.5 lbs per batch			0.293 lbs. per batch	Yes
Chloroform	858.5 lbs per year	12-month rolling time period as determined at the end of each calendar month.	EUS-13STILL	0 lbs. per year	Yes
VOC (excluding methylene chloride)	12.4 lbs per batch			9.33 lbs. per batch	Yes

Records provided to make the above compliance assessments are discussed further below.

In addition to the limits above, the facility has the limits in the table added below. These limits are established by testing protocols outlined in the testing and sampling section of the permit, which outlines that manufacturer data may be utilized unless otherwise requested by the AQD. At this time, it is not felt that testing is necessary and so manufacturer data can be utilized. Manufacturer data was on site for review and confirmed compliance with the below limits.

Pollutant	Limit	Time Period/ Operating Scenario
1. Chloroform	0.38 pph	Test Protocol*
2. 1, 4-Dioxane	0.06 pph	Test Protocol*
3. Ethylene Dichloride	0.14 pph	Test Protocol*
4. Methylene Chloride	0.66 pph	Test Protocol*
5. Tetrahydrofuran	0.21 pph	Test Protocol*
6. Pyridine	0.03 pph	Test Protocol*
7. Chloroform	2.00 pph	Test Protocol*
8. 1, 4-Dioxane	0.33 pph	Test Protocol*
9. Ethylene Dichloride	0.14 pph	Test Protocol*
10. Methylene Chloride	3.50 pph	Test Protocol*
11. Tetrahydrofuran	1.13 pph	Test Protocol*
12. Pyridine	0.14 pph	Test Protocol*
13. Methylene Chloride	6.80 pph	Test Protocol*
14. Pyridine	0.30 pph	Test Protocol*
15. Tetrahydrofuran	2.20 pph	Test Protocol*
16. Ethylene Glycol Dimethyl Ether	1.30 pph	Test Protocol*
17. Methylene Chloride	3.78 pph	Test Protocol*

This FG has multiple process/operational restrictions limiting what chemicals may be processed in each still. For brevity, the intricacies will not be reiterated in this report. During a review of records and discussions with the facility representatives it appears the facility is in compliance with all permitted process/operational restrictions.

This FG has multiple design/equipment parameters requiring that stills not be operated unless necessary temperature control devices, temperature monitors, and secondary condensers are installed and operating properly as outlined within the PTI. All equipment was to be designed, installed, and operating as required. The following temperature readings were made during the inspection of this equipment:

- EUS-8STILL was not running but had a functional temperature monitor that was observed during the inspection to be compliant with the requirement.
- EUS-13STILL at -37.1°C, complying with requirement of -30°C or less.

- EUS-14STILL at -34.5°C, complying with requirement of -25°C or less.

This FG has extensive record keeping requirements. For brevity, a summary of these requirements is discussed in this report. For detailed requirements the PTI can be consulted. The facility is required to keep monthly and annual emission records as outlined in the table above. The facility must also keep detailed batch records that includes details regarding chemicals used and the amounts of each used. The facility must also keep temperature records for all condensers. These records were all provided adequately by the facility and used to make the above compliance evaluations. A copy of the records is included with this report.

The below table summarizes all stacks associated with this FG. All stacks were observed and appeared compliant with the requirements. No stacks were directly measured for safety reasons.

Stack & Vent ID	Maximum Exhaust Diameter / Dimensions (inches)	Minimum Height Above Ground (feet)
1. SVS-12		29
2. SVS-14	NA	29
3. SVS-15	NA	29
4. SVS-18	NA	29
5. SVS-22	1	29.5
6. SVS-21	1	29.5
7. SVS-5	1.5	30
8. SVS-17a	6	40.5
9. SVS-17b	1	29.0
10. SVS-2	2	40.5
11. SVS-3	2	40.5

FGFACILITY

The following requirements apply to all process equipment within the facility.

The following table summarizes the emission and material limits as well as summarizing compliance based on observations and provided records:

Pollutant / Materail	Limit	Time Period /	Equipment	Recorded Actuals (Max)	Compliant?
Each Individual HAP	Less than 9.0 tpy	12-month rolling time period as determined at the end of each calendar month.	FGFACILITY	0.93 tpy Methanol	Yes
Aggregate HAPs	Less than 22.5 tpy			3.47 tpy	Yes
VOC	Less than 89.0 tpy			4.66 tpy	Yes
VOC	40,000,000 liters per year			4,099,523 liters per year	Yes
HAP limits: Level 1: acetonitrile methanol methylene chloride	5,000,000 liters per year for each chemical in this level			1,666,211 liters per year acetonitrile	Yes
HAP limits: Level 2: Hexane	2,000,000 liters per year for			235, 873 liters per	Yes

Toluene	each chemical in this level 400,000 liters per year for each chemical in this level	year toluene 26,817 liters per year dimethyl formamide	Yes
HAP limits:			
Level 3:			
All other HAPs			

Records provided to make the above compliance assessments are discussed further below.

This FG has one process limit which states that all waste materials must be captured and stored in closed containers and disposed of appropriately. During the inspection closed waste containers were observed and removal was discussed and is done in an acceptable manner.

This FG is required to use manufacturer data for determination of HAP content of any used material unless further testing is requested by the AQD. The facility is using manufacturer data in accordance with this requirement. At this time further testing is not necessary.

The facility is required to keep HAP and VOC emissions data as well as usage data for HAP and VOC containing material. These records were provided for and used to make the compliance evaluations outlined in the table above. Note, for brevity only the highest individual HAP has been entered into the table for brevity. All other HAPs can be found in the attached records and show fewer emissions than what is entered in the table. The facility is compliant with record keeping requirements.

The facility is required to comply with the National Emissions Standards of Hazardous Air Pollutants (NESHAP) 40 CFR Part 63 Subpart VVVVVV as an area source for HAPs that has a chemical manufacturing processing unit that uses materials listed in Table 1 of the NESHAP. The facility provided initial notification to the AQD on February 26, 2010 as required. All equipment met the standards established in the NESHAP including covering and venting requirements of the stills. The facility has accepted throughput limits of the associated materials and provided the following emissions data for the applicable stills:

Material	**Still 8 Emissions (lbs./year)**	**Still 13 Emissions (lbs./year)**	**Still 14 Emissions (lbs./year)**
Chloroform	22.57	0	0
Methylene Chloride	21.79	284.52	0

This emissions data demonstrates that the facility is compliant with the NESHAP emission tracking requirements.

Other Items
In 2018 during the last inspection, it was discussed that the facility utilizes various exemptions for the following materials used on site:

- 2-butoxyethanol
- T-butyl alcohol
- Iso-hexane

- Methyl benzoate
- Tetradecane

A detailed analysis by the facility of these chemicals and how they meet requirements of exemption Rule 285(c)(iii) was provided on September 17, 2018. This documentation is maintained in the facility file with the AQD. Analysis of current Rule 285(c)(iii) exemptions shows that no other actions are required by the facility at this time as no additional changes have occurred.

This facility has two new boilers that were recently installed in the winter of 2021-2022 to replace older boilers that were on site. Both are rated at 5 mmBtu/hr and operated on natural gas only. These boilers are exempt from New Source Performance Standards (NSPS) 40 CFR Part 60 Subpart Dc as they are less than 10 mmBtu/hr output boilers. They are also exempt from NESHAP 40 CFR Part 63 Subpart JJJJJJ as they are gas-fired equipment.

The facility operates many pieces of equipment that utilize permitting exemption Rule 290. Documentation for all of the following equipment was provided to demonstrate compliance with this exemption rule:

- Vacuum pumps
- R2, R4, R5
- Tank Farm Hose Dry
- Novpak Puller
- Carbon Treatment
- Acetone Tank

These Rule 290 exemption records were reviewed and appear to be accurate and appropriate.

The facility completed their 2021 MAERS submission as required on time and complete.

Conclusion
At the conclusion of this inspection the facility is compliant with all permit requirements as well as all other applicable air quality rules and regulations.

NAME Scott Evans DATE 9/22/2022 SUPERVISOR HH