WISCONSIN DEPARTMENT OF NATURAL RESOURCES
COMPLIANCE MONITORING REPORT (CMR)

FID: 154062150	**Site Visit Date: June 23, 2023**

Facility Name and Location:
Evonik Corporation
337 Vincent St
Milton, WI 53563-1146

County:	Rock

Air Compliance Evaluation Type:	**Full Compliance Evaluation (FCE)**
EPA Committed Compliance Evaluation:	**Yes, Committed**
Announced Compliance Evaluation:	**Yes**
Compliance Assistance Provided:	**Yes**
Credentials Shown:	**Yes**
Codes and Description:	**SIC[1]:** 2843 Surface Active Agents **NAICS[2]**: 325613 Surface Active Agent Manufacturing
EPA Class Code:	**SM80**

Compliance Monitoring Report (CMR) Conclusion:

This compliance evaluation was based upon a site visit and the review of Evonik Corporation records, and operation permit 15406215A-P21 issued 12/07/2022.

Air Pollution Control Permits:
For the basis of this inspection report, permits and applications found at the following DNR Air Management link were utilized: https://dnr.wi.gov, search "air permits" and choose Search for a permit. Once on the facility page, choose the "Permits and Permit Application" tab.

Emission Inventory Reports:
For the basis of this inspection report, emission inventories for years 2020 through 2022 found at the following DNR Air Management link were utilized: https://dnr.wi.gov, search "air permits" and choose Search for a permit. Once on the facility page, choose the "Emission Inventory Reports" tab.

Contact Information:

Responsible Corporate Official	Facility Air Management Contact
Scott Gestrich, Plant Manager (608) 868-8257 scott.gestrich@evonik.com	Sondra Klipp, Sr. Environmental Specialist (608) 868-8225 Sondra.klipp@evonik.com

[1] SIC: Standard Industrial Classification
[2] NAICS: North American Industry Classification System

Primary Inspection Participants:

Sondra Klipp, Evonik Samuel Saeian, WDNR

Applicable Programs

☒	**SIP**	☐	**P62 NESHAP**
☒	**Part 70**	☐	**P63 NESHAP (MACT)**
☐	**NR 445**	☒	**P63 NESHAP (GACT)**
☐	**NR 405 PSD**	☒	**P64 CAM**
☐	**NR 408 NAA**	☐	**P75 CEM**
☒	**P60 NSPS**	☐	**P76 ACID RAIN**
☐	**P61 NESHAP**		

40 CFR Part 60, Subpart DC or Small Industrial-Commercial-Institutional Steam Generating Units
40 CFR Part 63, Subpart VVVVVV for Chemical Manufacturing Area Sources

Pollutant Specific Source Classifications:

PM	PM10	PM2.5	SO2	NOx	VOC	CO	Federal HAPs
B	B	B	B	B	SM	B	SM80

INSPECTOR SIGNATURE: Samuel Saeian **SIGNATURE DATE:** 07/19/2023
TITLE: **Air Management Engineer**

SUPERVISOR SIGNATURE: Barbara Pavliscak **SIGNATURE DATE:** 07/19/2023
TITLE: **Supervisor**

CC: **Bureau of Air Management**
Scott Gestrich and Sondra Klipp, Evonik Corporation

FACILITY DESCRIPTION

Evonik Corporation (Evonik or the facility) produces specialty chemicals, primarily sold as components to formulators, fuel and lube additives, mining flotation reagents and polyurethane manufacture. The permittee uses natural and synthetic alcohols, oils and fatty acids to manufacture a wide range of amines and amine derivatives. These materials are commonly known as cationic and amphoteric surfactants. Products are used as components in household, industrial and institutional cleaners as well as mining, roof coatings, asphalt, and other industrial applications.

Raw materials are received in drums and tank wagons on rail cars. The drums of raw materials are stored inside warehouses. Bulk raw materials are stored in tanks. Some of the raw material tanks are dedicated-service tanks, while others are swing tanks, which are used for a variety of materials. All swing tanks have been combined under one tank designation as T30.

Usually, products are made by reacting the raw materials under elevated temperatures and pressures in one of eight multi-purpose reactors, P01, P02, P03, P04, P13, P60, P70 and P80. Reaction chemistry includes alkoxylation, quaternization with methyl chloride, cyanoethylation, hydrogenation, and formation of salts and amphoterics. Reaction of urea and dimethylaminopropylamine and a glycol which produces ammonia as a byproduct is also performed. Emissions from reactors are controlled using an ammonia recovery system C80, or a cryogenic vapor recovery system C70.

The process drumming hood emissions from handling low VOC materials are uncontrolled and emissions from handling high VOC materials are controlled under process P09. Emissions from loading finished products onto tank wagons are covered under process P31 and are controlled by the cryogenic condensation system (C70) or the ammonia control system (C80) depending on the type of batch reaction employed in the process.

The permittee also makes some products in blend tanks. Blend tanks are included under one process description P08, with working and breathing losses emitted, through a placeholder stack, S08 uncontrolled except the emissions from four of the blend tanks (TK204, TK205, TK209 and TK210). The emissions from these four tanks are controlled by the cryogenic vapor system, with stack S70.

Intermediate and finished products are stored in swing tanks or are put into 55-gallon drums or totes. Products are shipped to customers primarily in tank wagons, totes and drums.

Two natural gas fired boilers (B02/S12 and B03/S13) provide power and steam for process heating and freeze protection. These boilers each rated at greater than 10 MMBtu/hr are subject to the new source performance standards (NSPS Subpart DC).

Stack and Process Index:

A. B02/S12 - Natural Gas Fired Boiler Rated at 12.6 MMBtu/hr. Last Constructed/Modified 1990.
   B03/S13 - Natural Gas Fired Boiler Rated at 14.5 MMBtu/hr. Last Modified 1996.
B. P08/S08 - 10 Blend Tanks. Last Constructed/Modified 1980.
C. P09/S09 - Process Drumming Hood. Last Constructed/Modified 2000.
   P31/S31 - Tankwagon Loading. Last Constructed/Modified 2006.
D. P01 - Amine Derivatives Reactor R-1 and ancillary equipment including D-126. Last Constructed/Modified 1973.
   P02 - Hydrogenation and Derivatives Reactor R-2 and ancillary equipment including TK 805 and D-126. Last Constructed/Modified June 26, 1995.
   P03 - Hydrogenation Reactor R-3 and ancillary equipment including TK 805 and D-3. Last Constructed/Modified 1978.
   P04 – Intermediate s and Amine Derivative Reactor R-4. Last Constructed/Modified 1978.
   P13 - Hydrogenation Reactor R-5 and ancillary equipment including TK 805 and D-5. Last Constructed/Modified August 31, 1992.
   P60 - Batch Chemical Reactor R-6 and ancillary equipment including D-6. Last Constructed/Modified 2006.
   P70 - Hydrogenation Reactor R-7 and ancillary equipment including TK 807 and D-7. Last Constructed/Modified June 26, 1997.
   P80 - Hydrogenation Reactor R-8 and ancillary equipment including TK 808, D-8. Last Constructed/Modified

October 2005.

E. T03 - Propylene Oxide Storage Tank. Installed/last Modified 2001.

F. T06 - Acrylonitrile Storage Tank. Installed/last modified 1994.

G. T11 - Ethylene Oxide Storage Tank. Constructed 1998.
T112 – Two Ethylene Oxide Intermediate Transfer Tanks. Constructed 1998.

H. T30/S30 or S80 - 32 Swing tanks store various chemicals including Nitriles, Amines, and Alcohols; and 7 Isocontainers used as storage tanks. Last constructed/modified 2006. Emissions are uncontrolled except when stored chemical products containing greater 1% of ammonia is used and ammonia emissions are controlled using C80.

I. T92 - Hazardous Waste Storage Tank. Last constructed/modified 1994.

J. P99/F99 - Fugitives Emissions from Equipment Leaks.

ZZ. Conditions Applicable to the Entire Facility

ZZZ. Operating Requirements

Emissions from P01, P02, P03, P04, P31, P60, P70 and P80 are controlled using Cryogenic Condenser C70 or Ammonia Control System C80, as appropriate.

Emissions from P01, P02, P03, P04, P31, P60, P70 and P80 are controlled using Cryogenic Condenser C70 or Ammonia Control System C80, as appropriate.

Emissions from T03, T06, T11, T112 and T92 are controlled using Cryogenic Condensation System C70.

Facility Observations:

☒Time of arrival 12:45 PM
☒Check in time (1:00 PM)
☐Facility security orientation
☒Weather conditions (85ºF, 5-10 mph winds and mostly sunny skies.)
☒Sights and sounds observed (no visible emissions and no odors were observed from the perimeter of the facility.)
☐Photos/videos taken

Records reviewed during this compliance evaluation:

☒Malfunction Prevention and Abatement Plan	☒NESHAP Records
☒Malfunction Prevention and Abatement Plan Records	☐PSD Records
☐Fugitive Dust Control Plan	☐PSD Source Obligation Records
☐Fugitive Dust Control Plan Records	☐Non-Attainment Area Records
☒CAM Plan	☒Results of Monitoring Reports
☒CAM Plan Records	☒Compliance Certification
☐SSM Plan	☒Emission Inventory Submittal
☐SSM Plan Records	☒Next Business Day Deviations
☐Acid Rain Plan	☐NESHAP Compliance Reports
☐Acid Rain Plan Records	☐NSPS Compliance Reports
☐QA/QC Plan	☐PSD Compliance Reports
☐QA/QC Plan Records	☐SSM Compliance Reports
☐Odor Control Plan	☒CAM Compliance Reports
☐Odor Control Plan Records	☐CEM Compliance Reports
☒Compliance Monitoring Report History	☐Fuel Sampling and Analysis Reports (FSA)
☒Complaint History	☒1-Bromopropane Outreach
☒NSPS Records	☐Other (Identify)

General Facility Comments and Findings:

Malfunction Prevention and Abatement Plan/Records

The permittee last updated the Malfunction Prevention and Abatement Plan for the facility in September 2022. The plan outlines a description of the facility, the purpose of the plan, the interlocks detailed in the plan, the general provisions of the plan and the corrective actions to be taken to a malfunction. The plan has a thorough maintenance plan for each equipment that pertains to air management. The permittee notes the spare parts maintained onsite to reduce downtime for routine repairs and minimize emission releases. The plan details actions that are taken on a routine schedule to decrease the likelihood of a malfunction. The permittee developed a checklist that identifies if components need replacement or not.

Compliance Monitoring Report History

The permittee has a requirement to submit semi-annual monitoring reports to the department. The permittee has submitted the monitoring reports as required on the semi-annual schedule.

Complaint History

The department has not received any complaints from the operation of the facility.

Results of Monitoring Reports

The permittee has noted continuous and intermittent compliance in monitoring reports since the beginning of 2020. The permittee provides monitoring records for the temperature of the cryogenic condenser, Leak Detection and Repair records of components across the facility, the VOC emissions generated from reactor vessels, the pH of reactor vessel TK803, the temperature records of the catalytic oxidizer, the temperature and pressure for the ethylene oxide storage tank, monthly blend tank VOC emissions generated each day, drumming operation and emission generated, methyl chloride emissions generated each month, batch records from production in reactor vessels, and CAM quarterly records. Instances of deviations were of short duration. One instance on 12/16/2020 is where the tank TK 803 was locked out for 2.5 hours and the pH exceeded 7.0. Other deviations were instances where the SAP failed to notify staff of routine maintenance.

Compliance Certification

The permittee has noted continuous and intermittent compliance in compliance certifications since the beginning of 2020. The permittee was encouraged to utilize the e-signature delivery option instead of mailing the hard copies.

Emission Inventory Submittal

The permittee has submitted emission inventory to the department in a timely manner. The emission inventory submissions demonstrate the permittee is properly classified a synthetic major source for air emissions. All emission inventory fees have been paid in a timely manner.

	CO (Tons)	NOx (Tons)	PM (Tons)	VOC (Tons)	SO_2 (Tons)	Ethylene Oxide (Pounds)
2022	2.13	2.54	1.03	3.11	0.001	190
2021	2.27	2.70	1.04	3.94	0.001	162
2020	2.46	2.93	1.06	6.39	0.002	176

CAM Plan/CAM Compliance Reports

The permittee has a CAM plan for the cryogenic condenser for the control of methyl chloride and VOCs. The permittee notes the quarterly testing of the interlock system that does not emissions from the reactor vessels unless the cryogenic condenser is -112°F or colder. The permittee completes annual calibrations of the temperature monitoring device of the cryogenic condenser.

1-Bromopropane Outreach
The department brought attention to EPA's reclassification of 1-Bromopropane to be a federal HAP. The permittee committed to review products used on-site to quantify 1-Bromopropane containing product emissions.

Compliance Emission Testing Since Previous Inspection:

Compliance Emission Testing Comments:

No stack test has been required over the compliance of this evaluation. No stack test has been completed by the permittee since 2007.

Enforcement History (past 10 years): None

Safety Equipment Required for Site Visit:

☒Hearing Protection
☒Hard Hat
☒Safety Glasses
☒Safety Shoes
☒Safety Vest (Fire Resistant)
☐Other (hair net, dust mask, etc.)

PROCESS INFORMATION

A. B02/S12 Natural Gas Fired Boiler Rated at 12.6 MMBtu/hr. Constructed/ Last Modified 1990; and B03/S13 - Natural Gas Fired Boiler Rated at 14.5 MMBtu/hr. Constructed/Last Modified 1996.

PROCESS DESCRIPTION:
These boilers are subject to the NSPS for Small Industrial-Commercial-Institutional Steam Generating Units.

OBSERVATIONS:
No visible emissions were seen from the stacks. The boilers were not operating at the time of the inspection.

RECORDS REVIEWED:
- Stack height drawings indicate boiler B02 is 21 feet above the ground. Stack height drawings indicate boiler B03 is 23 feet above the ground.
- The permittee only fires natural gas in these two boilers.

FINDINGS:
No evidence of violations.

B. P08/S08/S70 - 11 Blend Tanks. Constructed/Last Modified after 1980

OBSERVATIONS:
The cryogenic condenser was receiving a delivery of liquid nitrogen at the time of the inspection. The condenser temperature was being monitored from the control room. The temperature reading of the cryogenic condenser in the control room was -135°F and the set point was -120°F. The permittee continuously tracks the pH of tank TK803 from the control room. The pH at time of the inspection was 6.8. The operators noted that more acid would be added soon to reduce the pH in the solution. No odors were identified around the blend tanks. The permittee has identification tags on each connection, valve and other components.

RECORDS REVIEWED:
- The permittee tracks the amount of volatile organic compound emissions from each of the 11 blend tanks every day. The facility tracks the types of batches that are blended each day. The permittee has emission factors that are used for each batch. The permittee vents emissions to the cryogenic condenser when volatile organic compounds are present. The permittee tabulates the monthly volatile organic compound emissions generated from each blend tank in the monitoring reports. Of the records reviewed of the monthly volatile organic compound emissions in the monitoring reports, the use of cryogenic condenser maintained the volatile organic compound emissions below 15 pounds per day.
- The temperature history of the cryogenic condenser was reviewed. The cryogenic condenser has a set point of -120°F. The temperature of the cryogenic condenser oscillates with time. The permittee has an interlock that will not allow volatile organic compound emissions to be vented until the cryogenic condenser is -112°F or colder. The cryogenic condenser's temperature is not maintained at below -112°F when non-volatile organic compound containing batches are in operation. However, it appears that the temperature of the cryogenic condenser was maintained below -112°F at all times when volatile organic compounds were present. Volatile organic compound containing materials will not be vented until the temperature reaches the -112°F threshold. The permittee continuously tracks and records the temperature in the last stage of the cryogenic condenser.
- The permittee tracks the monthly emissions from TK209 and TK210. Of the monthly volatile organic compound emissions from TK209 and TK210 the monthly emissions did not exceed 182 pounds per month on a 12-month rolling average after control of emissions from the cryogenic condenser.
- The permittee completes routine tank inspections and maintenance as outlined in the compliance assurance monitoring and malfunction prevention and abatement plans. The permittee tracks each completed inspection of components in the malfunction prevention and abatement plan checklist and includes the date of completion. The permittee tracks all work orders in the facility's systems application and products database. For work completed by third party contractors, the permittee includes the invoices in the monitoring reports.
- The permittee only manufactures nitriles and adducts in TK204 and TK205. This is a requirement of the permittee's permit.
- The permittee only manufactures amphoteric products in TK204, TK205, TK209, and TK210.
- The permittee vents emissions to the cryogenic condenser when acrylonitrile emissions are present in TK204, TK205, TK209, and TK210. This is a requirement of the permittee's permit.
- Of the records reviewed, the permittee maintained the pH of the phosphoric acid solution below 7.0 at all times in the last three years except for a 2.5 hour period on 12/16/2020. The permittee continuously monitors the pH in TK803. The permittee changes the solution every few weeks to maintain low pH solutions in TK803.

FINDINGS:
No evidence of violations.

C. P09/S09 - Process Drumming Hood. Constructed/Last Modified 2000; and P31/S31 - Tankwagon Loading. Constructed/Last Modified 2006.

OBSERVATIONS:

The cryogenic condenser was receiving a delivery of liquid nitrogen at the time of the inspection. The condenser temperature was being monitored from the control room. The temperature reading of the cryogenic condenser in the control room was -135ºF and the set point was -120ºF. The permittee continuously tracks the pH of tank TK803 from the control room. The pH at time of the inspection was 6.8. The operators noted that more acid would be added soon to reduce the pH in the solution. No odors were identified around the drumming operation. The permittee has identification tags on each connection, valve and other components.

RECORDS REVIEWED:

- The permittee tracks the daily volatile organic compound emissions from the drumming process. The permittee notes each product that is drummed and notes if volatile organic compounds are present. The permittee has emission factors for each product drummed if volatile organic compounds are present. Of the records reviewed of monthly volatile organic compound emissions generated each month from drumming process in the last two years, no month had more than 38 pounds of volatile organic compound emissions. The permittee has a limit to not emit more than 15 pounds of volatile organic compound emissions per day. No day of drumming volatile organic compound emissions exceeded the 15 pound per day limit.
- The temperature history of the cryogenic condenser was reviewed. The cryogenic condenser has a set point of -120ºF. The temperature of the cryogenic condenser oscillates with time. The permittee has an interlock that will not allow volatile organic compound emissions to be vented until the cryogenic condenser is -112ºF or colder. The cryogenic condenser's temperature is not maintained at below -112ºF when non-volatile organic compound containing batches are in operation. However, it appears that the temperature of the cryogenic condenser was maintained below -112ºF at all times when volatile organic compounds were present. Volatile organic compound containing materials will not be vented until the temperature reaches the -112ºF threshold. The permittee continuously tracks and records the temperature in the last stage of the cryogenic condenser.
- The permittee completes routine inspections of the drumming operation and maintenance as outlined in the compliance assurance monitoring and malfunction prevention and abatement plans. The permittee tracks each completed inspection of components in the malfunction prevention and abatement plan checklist and includes the date of completion. The permittee tracks all work orders in the facility's systems application and products database. For work completed by third party contractors, the permittee includes the invoices in the monitoring reports.
- Of the records reviewed, the permittee maintained the pH of the phosphoric acid solution below 7.0 at all times in the last three years except for a 2.5 hour period on 12/16/2020. The permittee continuously monitors the pH in TK803. The permittee changes the solution every few weeks to maintain low pH solutions in TK803.
- The tankwagon loading process P31 does not have methyl chloride concentrations greater than 1%. As a result, emissions are rarely vented to the cryogenic condenser.

FINDINGS:

No evidence of violations.

D. S80 and S70, P01 - Amine Derivatives Reactor R-1 and ancillary equipment including D-6. Constructed/Last Modified 1973;
P02 - Hydrogenation and Derivatives Reactor R-2 and ancillary equipment including D-123. Constructed/Last Modified June 26, 1995;
P03 - Hydrogenation Reactor R-3 and ancillary equipment including TK 805. Constructed/Last Modified 1978;
P04 - Intermediates and Amine Derivatives Reactor R-4. Constructed/Last Modified 1978;
P13 - Hydrogenation Reactor R-5 and ancillary equipment including TK 805, D-5. Constructed/Last Modified August 31, 1992;
P60 - Batch Chemical Reactor R-6 and ancillary equipment including D-6. Constructed/Last Modified 2006;
P70 - Hydrogenation Reactor R-7 and ancillary equipment including TK 807, D-7 Constructed/Last Modified June 26, 1997; and
P80-Hydrogenation Reactor R-8 and ancillary equipment including TK 808, D-8. Constructed/Last Modified October 2005.

OBSERVATIONS:

The cryogenic condenser was receiving a delivery of liquid nitrogen at the time of the inspection. The condenser temperature was being monitored from the control room. The temperature reading of the cryogenic condenser in the control room was -135°F and the set point was -120°F. The permittee continuously tracks the pH of tank TK803 from the control room. The pH at time of the inspection was 6.8. The operators noted that more acid would be added soon to reduce the pH in the solution. No odors were identified around the reactor vessels. The permittee has identification tags on each connection, valve and other components. The catalytic oxidizer was not operating at the time of the inspection.

RECORDS REVIEWED:

- The permittee tracks the amount of volatile organic compound emissions from each of the reactor vessels every day. The facility tracks the types of batches that are blended each day. The permittee has emission factors that are used for each batch. The permittee vents emissions to the cryogenic condenser when volatile organic compounds are present. The permittee tabulates the monthly volatile organic compound emissions generated from each blend tank in the monitoring reports. Of the records reviewed of the monthly volatile organic compound emissions in the monitoring reports, the use of cryogenic condenser maintained the volatile organic compound emissions below 15 pounds per day.
- The oxidizer operates for short periods every few days of operation as needed by the presence of volatile organic compounds. The emissions have an interlock that do not allow emissions to the oxidizer unless the temperature reaches a minimum of 545°F. Of the records reviewed of the oxidizer, it appears the oxidizer is usually not operating. A typical run of the oxidizer appears to last for only a few hours. There is a period of ramping up until the oxidizer reaches a temperature between 650°F and 700°F. The oxidizer is only used when daily volatile organic compound emissions would exceed 15 pounds.
- The temperature history of the cryogenic condenser was reviewed. The cryogenic condenser has a set point of -120°F. The temperature of the cryogenic condenser oscillates with time. The permittee has an interlock that will not allow volatile organic compound emissions to be vented until the cryogenic condenser is -112°F or colder. The cryogenic condenser's temperature is not maintained at below -112°F when non-volatile organic compound containing batches are in operation. However, it appears that the temperature of the cryogenic condenser was maintained below -112°F at all times when volatile organic compounds were present. Volatile organic compound containing materials will not be vented until the temperature reaches the -112°F threshold. The permittee continuously tracks and records the temperature in the last stage of the cryogenic condenser.
- All reactors have an interlocked pressure switch. When Methyl Chloride is present, emissions must be vented to the cryogenic condenser. When Ammonia is present, emissions must be vented to the ammonia control unit C80.
- The permittee completes routine reactor inspections and maintenance as outlined in the compliance assurance monitoring and malfunction prevention and abatement plans. The permittee tracks each completed inspection of components in the malfunction prevention and abatement plan checklist and includes the date of completion. The permittee tracks all work orders in the facility's systems application and products database. For work completed by third party contractors, the permittee includes the invoices in the monitoring reports.
- P04 does not have a pressure switch but routes all emissions to the cryogenic condenser unit. No ammonia containing materials are placed in reactor P04. The permittee does not hydrogenate ether nitriles or adducts in P04.
- The permittee vents emissions to the ammonia control unit (C80) whenever ammonia emissions are present.
- The permittee vents emissions to the cryogenic condenser (C70) whenever methyl chloride emissions are present.

D. S80 and S70, P01 - Amine Derivatives Reactor R-1 and ancillary equipment including D-6. Constructed/Last Modified 1973;
P02 - Hydrogenation and Derivatives Reactor R-2 and ancillary equipment including D-123. Constructed/Last Modified June 26, 1995;
P03 - Hydrogenation Reactor R-3 and ancillary equipment including TK 805. Constructed/Last Modified 1978;
P04 - Intermediates and Amine Derivatives Reactor R-4. Constructed/Last Modified 1978;
P13 - Hydrogenation Reactor R-5 and ancillary equipment including TK 805, D-5. Constructed/Last Modified August 31, 1992;
P60 - Batch Chemical Reactor R-6 and ancillary equipment including D-6. Constructed/Last Modified 2006;
P70 - Hydrogenation Reactor R-7 and ancillary equipment including TK 807, D-7 Constructed/Last Modified June 26, 1997; and
P80-Hydrogenation Reactor R-8 and ancillary equipment including TK 808, D-8. Constructed/Last Modified October 2005.

- Each of the batch reactors are equipped with a pressure switch except for P04.
- Of the records reviewed, the permittee maintained the pH of the phosphoric acid solution below 7.0 at all times in the last three years except for a 2.5 hour period on 12/16/2020. The permittee continuously monitors the pH in TK803. The permittee changes the solution every few weeks to maintain low pH solutions in TK803.
- The permittee last updated and submitted a compliance assurance monitoring plan to the Department in December of 2022.

FINDINGS:
No evidence of violations.

E. T03 - Propylene Oxide Storage Tank. Constructed/Last Modified 2001

OBSERVATIONS:
The propylene oxide storage tank was observed at the time of the inspection. No odors or visible emissions were identified around the propylene oxide storage tank. The cryogenic condenser was receiving a delivery of liquid nitrogen at the time of the inspection. The condenser temperature was being monitored from the control room. The temperature reading of the cryogenic condenser in the control room was -135ºF and the set point was -120ºF. The permittee has identification tags on each connection, valve and other components.

RECORDS REVIEWED:

- The permittee has a checklist that must be completed for all incoming deliveries of propylene oxide.
- The permittee has installed OPW Engineered Systems' Kamvalok dry fittings on all connections that are related to propylene oxide. The permittee transports propylene oxide using a closed loop submerged fill pipe transfer system.
- The permittee completes routine tank inspections and maintenance as outlined in the compliance assurance monitoring and malfunction prevention and abatement plans. The permittee tracks each completed inspection of components in the malfunction prevention and abatement plan checklist and includes the date of completion. The permittee tracks all work orders in the facility's systems application and products database. For work completed by third party contractors, the permittee includes the invoices in the monitoring reports. The interlocks are tested every quarter to vent propylene oxide emissions to the cryogenic condenser.
- The temperature history of the cryogenic condenser was reviewed. The cryogenic condenser has a set point of -120ºF. The temperature of the cryogenic condenser oscillates with time. The permittee has an interlock that will not allow volatile organic compound emissions to be vented until the cryogenic condenser is -112ºF or colder. The cryogenic condenser's temperature is not maintained at below -112ºF when non-volatile organic compound containing batches are in operation. However, it appears that the temperature of the cryogenic condenser was maintained below -112ºF at all times when volatile organic compounds were present. Volatile organic compound containing materials will not be vented until the temperature reaches the -112ºF threshold. The permittee continuously tracks and records the temperature in the last stage of the cryogenic condenser.

FINDINGS:
No evidence of violations.

F. T06 - Acrylonitrile Storage Tank. Constructed/Last Modified 1994

OBSERVATIONS:

The acrylonitrile storage tank was observed at the time of the inspection. No odors or visible emissions were identified around the acrylonitrile storage tank. The cryogenic condenser was receiving a delivery of liquid nitrogen at the time of the inspection. The condenser temperature was being monitored from the control room. The temperature reading of the cryogenic condenser in the control room was -135°F and the set point was -120°F. The permittee has identification tags on each connection, valve and other components.

RECORDS REVIEWED:

- The permittee vents all acrylonitrile emissions from the tank to the cryogenic condenser.
- The permittee only stores acrylonitrile in tank T06.
- The permittee has a checklist that must be completed for all incoming deliveries of acrylonitrile.
- The permittee has installed OPW Engineered Systems' Kamvalok dry fittings on all connections that are related to acrylonitrile. The permittee transports acrylonitrile using a closed loop vapor return system.
- The permittee completes routine tank inspections and maintenance as outlined in the compliance assurance monitoring and malfunction prevention and abatement plans. The permittee tracks each completed inspection of components in the malfunction prevention and abatement plan checklist and includes the date of completion. The permittee tracks all work orders in the facility's systems application and products database. For work completed by third party contractors, the permittee includes the invoices in the monitoring reports. The interlocks are tested every quarter to vent acrylonitrile emissions to the cryogenic condenser.
- The temperature history of the cryogenic condenser was reviewed. The cryogenic condenser has a set point of -120°F. The temperature of the cryogenic condenser oscillates with time. The permittee has an interlock that will not allow volatile organic compound emissions to be vented until the cryogenic condenser is -112°F or colder. The cryogenic condenser's temperature is not maintained at below -112°F when non-volatile organic compound containing batches are in operation. However, it appears that the temperature of the cryogenic condenser was maintained below -112°F at all times when volatile organic compounds were present. Volatile organic compound containing materials will not be vented until the temperature reaches the -112°F threshold. The permittee continuously tracks and records the temperature in the last stage of the cryogenic condenser.

FINDINGS:

No evidence of violations.

G. T11 - Ethylene Oxide Storage Tank. Constructed 1998; and T112 - Ethylene Oxide Intermediate Storage Transfer Tanks. Constructed 1998.

OBSERVATIONS:

The ethylene oxide storage tank was observed at the time of the inspection. No odors or visible emissions were identified around the ethylene oxide storage tank. A rail car of ethylene oxide was delivered and transferred to the storage tank earlier the week of the inspection and was onsite. The ethylene oxide storage tank pressure was 40 psi. The ethylene oxide storage tank temperature was 48.6ºF. The permittee has identification tags on each connection, valve and other components.

RECORDS REVIEWED:

- The permittee completes routine tank inspections and maintenance as outlined in the compliance assurance monitoring and malfunction prevention and abatement plans. The permittee tracks each completed inspection of components in the malfunction prevention and abatement plan checklist and includes the date of completion. The permittee tracks all work orders in the facility's systems application and products database. For work completed by third party contractors, the permittee includes the invoices in the monitoring reports. The interlocks and equipment are inspected and tested every quarter. The technicians note if the system passes operation standard.
- The permittee has installed OPW Engineered Systems' Kamvalok dry fittings on all connections that are related to ethylene oxide. The permittee uses four magnetic drive pumps in EHS service that do not have a leak interface. For ethylene oxide transfers, the permittee uses dual mechanical glycol sealed pumps. The dual mechanical glycol sealed pumps were recommended from the ethylene oxide supplier. These pumps operate with the seal at a higher pressure than contents and internal pressure sensors that interlock should a break in seal pressure be detected. The permittee has designed all equipment that handle ethylene oxide service to minimize sources of emissions by using Cam-tight Environmental Bonneted valves to eliminate potential leak points. The permittee has been replacing older lines containing threaded pipe service valves with welded flanged pipe and environmental bonnet valves with projects affecting the area and will continue to update the valves and connections. Any repair activities are completed with emissions vented through the acid scrubber.
- Of the records reviewed during the period of 2020, 2021, 2022 and through May of 2023, all storage temperatures of tank T112 were below 120ºF.
- Of the records reviewed during the period of 2020, 2021, 2022 and through May of 2023, all gage pressure records were below 90 PSI for tank T112.
- The permittee maintains the pressure relief valve in accordance with Leak Detection and Repair (LDAR) requirements. The permittee inspects the components used for ethylene oxide each month as required by LDAR has implemented enhanced LDAR. The permittee identifies a leak with a reading of greater than 100 ppm. See Part J for a review of the LDAR reports.

FINDINGS:

No evidence of violations.

H. T30 - Series of 32 Swing Tanks. Constructed/Last Modified 1997; and Series of 7 Isocontainers Constructed/Last Modified 2006.

OBSERVATIONS:

The permittee continuously tracks the pH of tank TK803 from the control room. The pH at time of the inspection was 6.8. The operators noted that more acid would be added soon to reduce the pH in the solution. No visible emissions were identified around the 32 swing tanks. There was a slight odor around the 32 swing containers.

RECORDS REVIEWED:

- All reactors have an interlocked pressure switch. When Ammonia is present emissions must be vented to the ammonia control unit(C80).
- Of the records reviewed, the permittee maintained the pH of the phosphoric acid solution below 7.0 at all times in the last three years except for a 2.5 hour period on 12/16/2020. The permittee continuously monitors the pH in TK803. The permittee changes the solution every few weeks to maintain low pH solutions in TK803.
- The permittee raised the stack height to 76 feet above the ground by September 2022.
- The permittee transfers materials from the tanks to reactors using submerged fill pipes.
- The permittee tracks the monthly amount of acrylonitrile emissions generated from the 32 swing tanks. In 2020 there was 21 pounds of acrylonitrile emissions generated from the 32 swing tanks. In 2021 there was 161 pounds of acrylonitrile emissions generated from the 32 swing tanks. In 2022 there was 189 pounds of acrylonitrile emissions generated from the 32 swing tanks. Through the Month of May of 2023, there has been 21.8 pounds of acrylonitrile emissions generated from the 32 swing tanks.

FINDINGS:

No evidence of violations.

I. T92 - Hazardous Waste Storage Tank. Constructed/last Modified 1994.

OBSERVATIONS:

The permittee has identification tags on each connection, valve and other components around the storage tank. There was a slight odor around the storage tank. The storage tank appeared in good structural integrity.

RECORDS REVIEWED:

- The permittee completes routine tank inspections and maintenance as outlined in the compliance assurance monitoring and malfunction prevention and abatement plans. The permittee tracks each completed inspection of components in the malfunction prevention and abatement plan checklist and includes the date of completion. The permittee tracks all work orders in the facility's systems application and products database. For work completed by third party contractors, the permittee includes the invoices in the monitoring reports. The interlocks and equipment are inspected and tested every quarter. The technicians note if the system passes operation standard.
- All emission due to breathing, standing and working from hazardous waste storage tank T92 is vented to the cryogenic condenser.
- The temperature history of the cryogenic condenser was reviewed. The cryogenic condenser has a set point of -120ºF. The temperature of the cryogenic condenser oscillates with time. The permittee has an interlock that will not allow volatile organic compound emissions to be vented until the cryogenic condenser is -112ºF or colder. The cryogenic condenser's temperature is not maintained at below -112ºF when non- volatile organic compound containing batches are in operation. However, it appears that the temperature of the cryogenic condenser was maintained below -112ºF at all times when volatile organic compounds were present. The permittee continuously tracks and records the temperature in the last stage of the cryogenic condenser.

FINDINGS:

No evidence of violations.

J. F99 - Fugitive Emissions from Piping, Pumps, Valves, etc.

OBSERVATIONS:

The permittee has identification tags on each of the components across the facility. The representative of Montrose Air Services had completed monitoring of the components for the month and noted that there were no leaks identified above the background concentration.

RECORDS REVIEWED:

- The permittee completes Leak Detection and Repair (LDAR) each month or quarter as required by outcomes of past LDAR events. The permittee monitors up to thousands of components during each LDAR event. The permittee has self-imposed themselves to be subject to LDAR VV standard which is for 10,000 ppm detection. The permittee performs repairs for detections of 100 ppm or more. Readings of 500 ppm or more are noted as a leak in their monitoring reports for components that do not contain ethylene oxide. The permittee contracts Montrose Air Services to complete LDAR monitoring. Montrose Air Services uses a TVA 2020 analyzer to complete the LDAR monitoring. The analyzer is calibrated each day prior to monitoring with the appropriate calibration gases. The contractor notifies the maintenance staff of any leaks as the leaks are identified. This allows the maintenance staff to initiate corrective actions and have a second monitoring event for the component. The permittee corrects most leaks the same day a leak is detected if possible.
- The permittee has worked with their contractor to obtained new monitoring equipment that had a lower level of noise at low background readings. The permittee monitors all components where ethylene oxide can be present to enhanced LDAR requirements of 100 ppm leak thresholds and with monthly monitoring events. The permittee initiates corrective actions with any value greater than background readings. Since the enhanced LDAR monitoring for ethylene oxide components was implemented in 2021, there has been three instances where leaks have exceeded 100 ppm. The permittee corrected each of the leaks within five days of detection.
- The permittee has caps at the end of each open-ended valve. The valve makes the system enclosed at all times. All emissions are vented to the appropriate control device prior to release.
- The permittee records volatile organic compound PPM readings after removing the background concentration.
  Summary of LDAR reports:
  January through May of 2023: The permittee completed monitoring each month. There were five leaks identified during the LDAR events. The five leaks were repaired within 15 days. No components were added or removed during this period.
  July-December of 2022: The permittee completed monitoring each month. There were no leaks identified during the LDAR events. No components were added or removed during this period.
  January-June of 2022: The permittee completed monitoring each month. There were three leaks identified during the LDAR events. The three leaks were repaired within 15 days. No components were added or removed during this period.
  July-December of 2021: The permittee completed monitoring each month. There were no leaks identified during the LDAR events. The permittee added 184 new components and removed 22.
  January-June of 2021: The permittee completed monitoring each month. There were three leaks identified during the LDAR events. The three leaks were repaired within 15 days. No components were added or removed during this period.
  July-December of 2020: The permittee completed monitoring each month. There were two leaks identified during the LDAR events. The leaks were corrected within 15 days of detection. The permittee added 24 new components and removed 77.
  January-June of 2020: The permittee completed monitoring each month. There were no leaks identified during the LDAR events. The permittee added 15 new components and did not remove any components.

FINDINGS:

No evidence of violations.

ZZ. Conditions Applicable to the Entire Facility

RECORDS REVIEWED:

- The permittee completes quarterly LDAR monitoring events for all connections, valves, pumps and reactors that contains all compounds except ethylene oxide. The permittee completes monthly LDAR monitoring for all components that ethylene oxide can be present.
- The permittee calculates the rolling monthly emissions of methyl chloride each month. Of the records reviewed for the years of 2020, 2021, 2022 and through May of 2023, methyl chloride emissions have not exceeded 900 pounds in a month.
- The permittee tracks monthly emissions of propylene oxide, and acrylonitrile each month. The permittee uses emission factors developed for the different batch reactions to quantify emissions. The permittee emitted 6.02 pounds of propylene oxide in 2022 and 2.64 pounds through May of 2023. The permittee emitted 2.28 pounds of acrylonitrile in 2022 and 0.89 pounds through May of 2023.
- The permittee uses the data from the monthly batch history and LDAR events to quantify monthly ethylene oxide emissions. Since permit 15406215A-P21 was issued on December 7, 2022, 49 pounds of ethylene oxide emissions have been emitted from stack S70 at the facility.

FINDINGS:

No evidence of violations.

ZZZ. Operating Requirements

OBSERVATIONS:

The stack used to the swing tanks appears to have been raised to greater than 75 feet above the ground. No rain hat or other device was noticed on stacks across the facility.

RECORDS REVIEWED:

- The permittee has technical drawings that demonstrate that stacks are constructed to the correctly permitted heights.

FINDINGS:

No evidence of violations.

PART III - COMPLIANCE ASSURANCE MONITORING PLAN

RECORDS REVIEWED:

- The permittee has a compliance assurance monitoring plan that outlines how the cryogenic condenser is to be operated to control methyl chloride and other volatile organic compound emissions. The cryogenic condenser is set to maintain a minus 120^{o}F temperature, and the inlet flow is controlled to setpoint 50 SCFM. The permittee continuously monitors the pressure differential across the main condensing heat exchanger.
- The permittee completes an annual calibration of the temperature sensor.
- The permittee completes quarterly testing on the interlocks of the system. The permittee has an interlock that will not allow volatile organic compound emissions to be vented to the cryogenic condenser unless the temperature minus 80^{o}C or below. The permittee last completed a quarterly check on April 27, 2023.

FINDINGS:

No evidence of violations.

Emission Units, Operations and Activities Listed under s. NR 407.05(4)(c)9. Wis. Adm. Code:

Maintenance of grounds, equipment, and buildings
Stockpiled contaminated soils
Boiler, turbine, and HVAC system maintenance
Pollution control equipment maintenance
Internal combustion engine used for warehouse and material transfers
Fire control equipment
Janitorial services
Office activities
Convenience water heating
Convenience space heating (< 5 MMBtu/hr)
Demineralization and oxygen scavenging of water for boilers
Sanitary sewer and plumbing venting
10,000 gallon cooling tower
Wastewater sump
Research and development facilities
Quality control lab
P10 - Charging Process Vessels from Drums
The following tanks/vessel are insignificant source of emission:

Vessel	**Capacity (gal)**	**Material Stored**
TK101	30000	Methyl chloride
TK115 (T02)	7600	Diethylene triamine
TK120	14100	Wastewater
TK130	11600	Tallow diamine
TK135	11600	Hard tallow amine
TK140	11600	Coconut Oil
TK145 (T04)	10000	Glacial acetic acid
TK170	15000	Soya amine
TK155 (T01)	8500	Isopropyl alcohol
TK165	11375	Amine
TK900	9000	Nitrogen by VOC
TK601, 602 A, and 602 B	15000, 8000, and 8000	Wastewater
TK904	3000	Nitrogen
TK905	12000	Hydrogen
TK900	500	Nitrogen
TK175	14,000	Dimethylaminopropylamine
TK207		Nonvolatile amine
TK706	260	Condensate – Hazardous waste
D802	1000	Hazardous waste
TK700	1000	Recovered methyl Chloride

Vessel	Capacity (gal)	Material Stored
TK800	12,376	Anhydrous Ammonia Storage Tank