# Engineering Analysis

Huntsman Advanced Materials
Washington County
108-0022

On June 13, 2023, the Department received an application from Huntsman Advanced Materials ("Huntsman") located in McIntosh, Alabama. In this application, Huntsman requests the issuance of a Synthetic Minor Operating Permit (SMOP), and thus, the reclassification from a major source to an area source for hazardous air pollutants (HAPs).

## Background

This facility is a specialty organic chemical manufacturing plant which produces epoxy resins. The facility is allowed to operate 8760 hours per year. Huntsman currently operates under the third renewal of Major Source Operating Permit Number 108-022. The permit was originally issued on March 13, 2002. In December 2022, Huntsman made the business decision to decommission the following existing manufacturing operations: Area 12 Basic Liquid Resin (BLR) and Electrical Insulating Materials (EIM) operations and Area 19, Line 2 operations. With no plans to bring any decommissioned equipment back on site, the facility has submitted an application to convert to a synthetic minor (area) source for HAPs.

## Emissions

*Point Source Emissions*
Point source emission points include the Area 19 Thermal Oxidizer with Tail Gas Scrubber, the Area 19 Flare (back up to the thermal oxidizer), and six baghouses. Point source emission totals can be seen in the table below. The maximum individual HAP for point source emissions is hydrogen chloride (HCl). These emissions come from the combustion of halogenated organic compounds (allyl chloride and epichlorohydrin) in the Area 19 Thermal Oxidizer.

| Point Source Potential Emissions | | |
|---|---|---|
| Pollutant | Potential Emissions (TPY) | Title V Major Source Threshold |
| PM | 4.08 | 100 |
| $PM_{10}$ | 4.08 | 100 |
| $PM_{2.5}$ | 4.08 | 100 |
| $SO_2$ | 0.02 | 100 |
| VOC (total) | 0.21 | 100 |
| CO | 13.87 | 100 |
| $NO_X$ | 18.9 | 100 |
| Pb | 1.31E-05 | 100 |
| HAPs (HCl) | 9.39 | 10 |

*Fugitive Emissions*

Fugitive emissions make up most of the HAP emissions from the facility. Fugitive emissions are calculated using the Synthetic Organic Chemical Manufacturing Industry (SOCMI) Screening Ranges Emission Factors (kg/hr/component) for total organic compounds found in Table 2-5 of "Protocol for Equipment Leak Emission Estimates", EPA-453/R-95-017, November 1995. The results are displayed below.

| | Component Count | | | Emission Factor | | Potential Emissions | |
|---|---|---|---|---|---|---|---|
| Component Type | Sub Type | Number of Components in HAP service | Number of Components in VOC service | $\frac{\text{kg}}{\text{hr} \cdot \text{count}}$ | $\frac{\text{lb}}{\text{hr} \cdot \text{count}}$ | HAP service (TPY) | VOC service (TPY) |
| Valves | Gas/Vapor | 739 | 908 | 0.000131 | 0.0003 | 0.93 | 1.15 |
| | Light Liquid | 2,397 | 2,835 | 0.000165 | 0.0004 | 3.82 | 4.52 |
| | Heavy Liquid | 63 | 366 | 0.00023 | 0.0005 | 0.14 | 0.81 |
| Pumps | Light Liquid | 20 | 25 | 0.00187 | 0.0041 | 0.36 | 0.45 |
| | Heavy Liquid | 1 | 14 | 0.00210 | 0.0046 | 0.02 | 0.28 |
| Connectors | All | 9,627 | 12,679 | 0.0000810 | 0.0002 | 7.53 | 9.92 |
| Pressure Relief Devices | All | 16 | 25 | 0.04470 | 0.0985 | 6.91 | 10.79 |
| Agitators | All | 40 | 45 | 0.00187 | 0.0041 | 0.72 | 0.81 |
| **Total** | | | | | | **20.43** | **28.73** |

Huntsman calculated fugitive emissions for each individual HAP using the same emission factors displayed above. The only single HAP with fugitive emissions above the 10 TPY major source threshold is toluene. The table below displays component counts and potential fugitive emissions for toluene.

| | Component Count | | Emission Factor | | Potential Emissions | |
|---|---|---|---|---|---|---|
| Component Type | Sub Type | Number of Components in Toluene service | $\frac{\text{kg}}{\text{hr} \cdot \text{count}}$ | $\frac{\text{lb}}{\text{hr} \cdot \text{count}}$ | (lb/hr) | (TPY) |
| Valves | Gas/Vapor | 560 | 0.000131 | 0.0003 | 0.16 | 0.71 |
| | Light Liquid | 1,624 | 0.000165 | 0.0004 | 0.59 | 2.59 |
| | Heavy Liquid | 62 | 0.00023 | 0.0005 | 0.03 | 0.14 |
| Pumps | Light Liquid | 13 | 0.00187 | 0.0041 | 0.05 | 0.23 |
| | Heavy Liquid | 1 | 0.00210 | 0.0046 | 0.00 | 0.02 |
| Connectors | All | 6,283 | 0.0000810 | 0.0002 | 1.12 | 4.91 |
| Pressure Relief Devices | All | 4 | 0.04470 | 0.0985 | 0.39 | 1.73 |
| Agitators | All | 30 | 0.00187 | 0.0041 | 0.12 | 0.54 |
| **Total** | | | | | | **10.87** |

Potential toluene emissions calculated above assume 8,760 hours per year in operation. Although these potential fugitive toluene emissions exceed the 10 TPY major source threshold, actual emissions will be less than 10 TPY since Huntsman will utilize actual hours in service for their calculations. Huntsman will update product stream speciation within the facility's LDAR management software in order to obtain more accurate calculations when necessary. Although this calculation method still yields emissions above 10 TPY for toluene, it successfully demonstrates that implementation of a facility wide LDAR program for components in 5 wt% or greater HAP service and 10 wt% VOC service, combined with actual emissions calculations that incorporate stream speciation and hours in service, will successfully limit actual emissions to levels below major source thresholds for VOCs and HAPs.

The following table displays the plant-wide potentials and permit limits for each pollutant.

| Plant Wide Potential Emissions | | | |
|---|---|---|---|
| Pollutant | Potential Emissions (TPY) | Permit Limited Emissions (TPY) | Title V Major Source Threshold |
| PM | 4.08 | - | 100 |
| $PM_{10}$ | 4.08 | - | 100 |
| $PM_{2.5}$ | 4.08 | - | 100 |
| $SO_2$ | 0.02 | - | 100 |
| CO | 13.87 | - | 100 |
| $NO_X$ | 18.9 | - | 100 |
| Pb | 1.31E-05 | - | 100 |
| VOC | 39.6 | - | 100 |
| Total HAPs | 29.82 | 24.4 | 25 |
| Single HAP | 10.87 | 9.4 | 10 |

Based on the SMOP application, this facility is no longer a major source for HAPs. Since the potential HAP emissions rely so heavily on fugitive emission calculations, Huntsman proposes to continue the LDAR program currently in place for Miscellaneous Organic National Emission Standards for HAPs (MON) compliance at the facility as a means of "controlling" the potential emissions from fugitive sources.

**Prevention of Significant Deterioration (PSD)**

Huntsman is currently considered a synthetic minor source with respect to PSD. There will not be a project that would result in an increase in emissions from the facility. The facility would remain a synthetic minor source with respect to PSD. Therefore, a PSD review would not be required at this time.

**National Emission Standards for HAPs (NESHAP)**

*40 CFR 63 Subpart ZZZZ for Stationary Reciprocating Internal Combustion Engines (RICE)*
The Area 19 Generator is subject to 40 CFR 63 Subpart ZZZZ and the requirements listed in Table 2d and Table 6 of that subpart. This includes the following: change oil and filter every 500 hours of operation or annually, whichever comes first; inspect air cleaner every 1,000 hours of operation or annually, whichever comes first, and replace as necessary; inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary; operate and maintain the stationary RICE according to manufacturer's emission related operation and maintenance instructions.

*40 CFR 63 Subpart FF for Benzene Waste Operations*
As a chemical plant, Huntsman is subject to this regulation. The site maintains a current total annual benzene (TAB) calculation. The current TAB for the site remains less than 1 TPY. As such, there are no applicable ongoing reporting requirements or control requirements at the time the application was submitted. If process changes that would generate potential benzene containing waste occur, Huntsman will repeat the determination.

*40 CFR 63 Subpart VVVVVV for Chemical Manufacturing Area Sources*
Huntsman does not have any of the HAPs listed in Table 1 to this subpart present in their processes. Therefore, this subpart is not applicable.

The following regulations no longer apply to this facility as a result of area source reclassification:
40 CFR 63 Subpart A - General Provisions
40 CFR 63 Subpart H - NESHAP for Equipment leaks
40 CFR 63 Subpart W - NESHAP for Epoxy Resins Production and Non-Nylon Polyamides Production
40 CFR 63 Subpart SS - NESHAP for Closed Vent Systems, Control Devices, Recovery Devices, and routing to a Fuel Gas system or a process
40 CFR 63 Subpart FFFF - NESHAP from Miscellaneous Organic Chemical Manufacturing

**New Source Performance Standards (NSPS)**

*40 CFR 60 Subpart IIII for Compression Ignition Internal Combustion Engines*
The Data Center Emergency Generator is subject to 40 CFR 60 Subpart IIII. It will meet the requirements of Table 4 to this subpart by complying with the requirements of 40 CFR 63 Subpart ZZZZ.

*40 CFR 60 Subpart Kb for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, Or Modifications Commenced After July 23, 1984*
The tanks presented in the following table are storage vessels that will remain subject to 40 CFR Part 60, Subpart Kb. The tank documentation (storage material, vapor pressure, etc.) must be maintained for the life of the tanks.

| Tank No. | Tank Size (gallons) | Material In Tank | Maximum Vapor Pressure (psia) | Control Technique | Standard |
|---|---|---|---|---|---|
| 12-V-3400 | 80,000 | Isopropyl Alcohol | | | |
| 12-V-3600 | 50,000 | Epichlorohydrin | N/A | N/A | 335-3-10-.02(9)(b) |
| 19-V-995 | 500,000 | VOC | N/A | N/A | 335-3-10-.02(9)(b) |
| 19-V-996 | 500,000 | VOC | N/A | N/A | 335-3-10-.02(9)(b) |

**Title V**

Huntsman currently holds a Title V Major Source Operating Permit. With the proposed emission estimates and synthetic minor limitations (LDAR Program), Huntsman will now be considered an area source for HAPs. Criteria pollutant emissions from the facility are also below the Title V major source threshold. Therefore, Huntsman will be considered a synthetic minor source with respect to Title V. Huntsman will accept synthetic minor permit limits, and compliance with these limits will be demonstrated by incorporating a facility-wide LDAR program that is equivalent to the requirements in 40 CFR 63 Subpart H (rev. 11/19/2020). Upon issuance of the SMOP, Huntsman's Title V permit will be voided.

**Recommendation**

Since it appears that operations at the facility no longer produce emissions above the major source threshold for any pollutant, and all affected units would still be capable of meeting all state and federal regulations, I recommend that Huntsman be issued Synthetic Minor Source Operating Permit Number 108-0022-X023, pending the results of a required 15-day public comment period.

| | |
|---|---|
| 108-0022-X023 | Area 12: Waterborne Resins Unit<br>Area 19: Line 1 and Short Path Distillation, Line 3, Line 4M, Line 4R, Line 5, Line 6, Line 7 |

Holly T. Yeargan

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Chemical Branch
Air Division

September 1, 2023
Date

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