NORTH CAROLINA
DIVISION OF AIR QUALITY
Application Review

Issue Date: xx

Region: Wilmington Regional Office
County: New Hanover
NC Facility ID: 6500083
Inspector's Name: Ashby Armistead
Date of Last Inspection: 12/11/2020
Compliance Code: 3 / Compliance - inspection

Facility Data

Applicant (Facility's Name): Stepan Company

Facility Address:
Stepan Company
4600 Highway 421 North
Wilmington, NC 28401

SIC: 2824 / Organic Fibers, Noncellulosic
NAICS: 325222 / Noncellulosic Organic Fiber Manufacturing

Facility Classification: Before: Title V **After:** Title V
Fee Classification: Before: Title V **After:** Title V

Permit Applicability (this application only)

SIP: 02Q .0315, .0317, and .0711
NSPS: N/A
NESHAP: 6V
PSD: N/A
PSD Avoidance: Yes
NC Toxics: No
112(r): N/A
Other: None

Contact Data

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Application Data

Application Number: 6500083.20A
Date Received: 10/05/2020
Application Type: Modification
Application Schedule: TV-Significant

Existing Permit Data
Existing Permit Number: 00164/T55
Existing Permit Issue Date: 03/12/2021
Existing Permit Expiration Date: 09/30/2022

Total Actual emissions in TONS/YEAR:

CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2020	0.1400	23.49	20.47	23.02	3.22	1.84	1.08 [Dioxane, 1,4-]
2019	0.1800	30.44	28.48	32.47	3.75	1.86	0.9516 [Dioxane, 1,4-]
2018	0.1400	24.07	23.07	24.11	3.30	4.64	3.87 [Dioxane, 1,4-]
2017	0.1400	22.08	33.98	24.86	3.07	2.29	1.57 [Dioxane, 1,4-]
2016	0.1200	20.45	33.53	26.26	3.01	1.72	1.08 [Dioxane, 1,4-]
2015	0.0800	15.58	4.66	16.50	1.79	0.9192	0.5883 [Dioxane, 1,4-]

Review Engineer: Rahul Thaker	Comments / Recommendations:
Review Engineer's Signature: Date: February 10, 2022	Issue 00164/T56 Permit Issue Date: xx Permit Expiration Date: xx

1. Purpose

Stepan Company submitted a permit application to reclassify its Wilmington NC facility from major source to area source with respect to Hazardous Air Pollutants (NESHAPs). The application also includes a request for changing the corporate name (not an ownership change) from "INVISTA, S.àr.l." to "INV Performance Surfaces, LLC". The application was later amended to add a request to increase the facility's production level. The requested changes are significant changes to the existing monitoring, record keeping, and reporting requirements. Therefore, the application will be processed in accordance with the 15A NCAC 02Q .0516 and 02Q .0501(c)(1).

It needs to be stated at the outset that the application was submitted under the name of "INVISTA, S.àr.l. – Wilmington". Since then, the facility has been renamed as "Stepan Company". The current owner of the facility is Stepan Company. DAQ issued an air quality permit 00164T55 on March 12, 2021 to Stepan Company by separately processing an ownership change application (6500083.21A) which was submitted after the subject application (6500083.20A). The DAQ believes that since the current permit is issued to Stepan Company (current owner), as stated above, this corporate name change is not needed, and the issue included in the subject application is moot.

It should also be noted that the facility will still be required to hold a Title V permit pursuant to the area source NESHAP requirement even after the change of status (major to area) is approved.

2. Facility Description

The facility manufactures aromatic polyester polyols (PP) which are used in the manufacturing of rigid board or spray insulation foam. Products made at this site include Terate and Stepanpol Products.

3. Application Chronology

October 5, 2020	Application received.
June 30, 2021	Discussed the emissions calculations with the applicant. Sent an email on issues on air toxics, synthetic minor limits, lack of inclusion of emissions estimates for site remediation activities and organic liquid distribution (OLD) sources in potential to emit, and lack of emissions estimates for greenhouse gases (GHG), and numbers of storage tanks exceeding 20,000 gallons capacity.
July 7, 2021	Continued discussions with the facility on many different issues.
July 16, 2021	Discussed with the facility NESHAP 6V requirements.
July 16, 2021	Received the requested information on some specific questions raised by DAQ.
August 25, 2021	Received the information on revisions to the emissions estimates for the increased production level, listing of 6V applicability for insignificant activities, and other issues.
December 23, 2022	Received the information on change in actual emissions for the triggered pollutants for minor source baseline date and increase in production level v. previous (before modification) production level.
January 11, 2022	Received the information on correct SIC (Standard Industrial Classification) and NAICS (North American Industrial Classification System) codes for the facility.
January 21, 2022	Received the information on T6109R tank, and transfer operations, transfer rack, surge control vessel, or bottoms receiver, as regulated under 6V NESHAP.
February 1, 2022	Received the emissions estimate for the repurposed tank T-6109R.
February 2, 2022	Sent the pre-public notice version of the draft permit documents for review to the supervisor, DAQ Technical Services, regional office, and the applicant.
xx	Draft permit sent for public comment. Public comment period beings.

xx EPA review period begins.
xx DAQ issued the final permit.

4. Statement of Compliance

The Wilmington Regional Office conducted a full compliance inspection on December 11, 2020. The inspection report indicated that "the facility appeared to be operating in compliance with their air permit at the time of the inspection". In addition, the responsible official (RO) of the facility certified the facility compliance with the applicable requirements via the completed Form E5 "Title V Compliance Certification".

5. Modifications/Changes

The facility requested to change the major source applicability for HAPs emissions from "National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing (40 CFR 63, Subpart FFFF)" to "National Emission Standards for Hazardous Air Pollutants for Chemical Manufacturing Area Sources (40 CFR 63, Subpart VVVVVV)" by becoming an area source. The facility previously was deemed a major source for HAPs; thus, it was required to comply with the above referenced NESHAP along with all applicable General Provisions (Subpart A) in Part 63.

The applicant states that the facility has remained a synthetic minor source for HAPs since it had requested and obtained a synthetic minor status for PSD (Prevention of Significant Deterioration) in 2014. The applicant adds that the facility has implemented many changes over the last few years that have allowed it to continue to remain an area source for HAPs. But based on the EPA's prior policy, commonly known as "Once In, Always In (OIAI)[1]", and as required by the DAQ-issued air permits, the facility continued complying with the major source NESHAP (4F). Now based on the EPA's current policy[2], the facility is requesting to reclassify it as an area source and comply with the area source NESHAP (6V) instead of NESHAP (4F). This policy has since been codified through a formal rulemaking[3] which is commonly known as MM2A ("Major Maximum Achievable Control Technology (MACT) to Area"). It should be noted that through the issuance of the current policy, the EPA has withdrawn the previously issued OIAI policy. This EPA rulemaking has given a legal effect to the policy. In sum, the DAQ will review the submitted application based on the above MM2A rule and the 6V NESHAP.

The following Table 5-1 provides the emissions summary based on the potential emissions before control/limitations and after control/limitations for pollutants regulated under the Title V, PSD and hazardous air pollutants programs, and NC's air toxics program.

Table 5-1 Potential Emissions Rates

Regulated Air Pollutant	Potential Emissions Before Control/Limitations Tons Per Year	Potential Emissions After Control/Limitations Tons Per Year
PM	81.81	52.9
PM_{10}	65.48	36.6
$PM_{2.5}$	53.60	24.8
SO_2	210.98	< 100
NOx (as NO_2)	365.77	< 100
CO	195.80	< 100
VOC	272.54	< 100
Lead	0.02	0.02

[1] *"Potential to Emit for MACT Standards -- Guidance of Timing Issues"*, John S. Seitz, Director, Office of Air Quality Planning and Standards, EPA, May 16, 1995.
[2] *"Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act"*, William L. Wehrum, Assistant Administrator of Office of Air and Radiation, EPA, January 25, 2018. Notice was issued for this guidance at 83 FR 5543, February 8, 2018.
[3] *"Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act"*, 85 FR 73854, November 19, 2020 (2020-22044.pdf (govinfo.gov).

Regulated Air Pollutant	Potential Emissions Before Control/Limitations Tons Per Year	Potential Emissions After Control/Limitations Tons Per Year
GHG as CO_{2e}	345,628.00	345,628.00
Single HAP (1,4 Dioxane)	167.58	< 10
Total HAPs	176.3	< 25

The potential emissions above have been estimated based upon the increased production ("maximum possible production) level of 175,000 metric tonnes (MT) (or 192,900 short tons) from the previous production level of 60,000 metric tonnes (or 66,140 short tons). All input parameter values, used for estimating the potential emissions, are provided below:

Table 5-2 Input Parameter Values

Description	Unit(s)	Maximum Permitted
Combustion Devices		
Boiler 1 Natural Gas	kscf	1,707,602
Boiler 1 No. 2 Fuel Oil	kgal	12,696
Boiler 5 Natural Gas	kscf	2,100,351
Boiler 5 No. 2 Fuel Oil	kgal	15,616
B7600 Natural Gas	kscf	187,836
B7600 No. 2 Fuel Oil	kgal	1,397
G1955 Flare	kscf	170,760
1FT01570	kscf	143,385
HT Production		
Production	metric tonnes pounds	175,000 385,808,959
Silo Throughput	pounds	82,615,511
Process Water Generated	gallons	3,396,590
Wastewater to Truck	gallons	141,111
Total Water in Wastewater Treatment	gallons	88,188,242
Engines		
EG125	hours	500
EG20	hours	500
FP-1500-E through FP-1500-H	hours	500
Fugitive Emissions		
Not Related to Production; Numbers of Components	Nos.	1,500

Regarding the emissions rates/factors, the Permittee has utilized the AP-42 emissions factors for combustion sources (boilers, process heater, flare, engines)[4]. The PP production emissions have been estimated using this literature[5]. Fugitive (VOC/HAPs) emissions have been based upon the industry database[6], which incorporates the EPA's SOCMI (synthetic organic chemical manufacturing industry) default emissions rates. The applicant applied a safety factor of 2 to these default emissions rates. Various storage tanks' emissions are based upon AP-42 emissions factors for

[4] Section 1.3 Fuel Oil Combustion, 5/10, Section 1.4 Natural Gas Combustion, 7/98, and Section 3.3 Gasoline and Diesel Industrial Engines, 10/96.
[5] Yaws Handbook of Physical Properties for Hydrocarbons and Chemicals, 2015, and Yaws Handbook for Vapor Pressure Antoine Coefficient, 2015.
[6] LeakDAS, for managing fugitive emission compliance operations for leak detection and repair (LDAR) operations.

storage tanks[7]. The raw material storage silo's emission rate is based upon AP-42 emissions factors[8]. Wastewater treatment units' emissions are based on EPA wastewater treatment model[9].

Finally, the emissions estimate for both the VOC and HAPs account for 98 percent reduction in emissions with the operation of the installed flare for the manufacturing sources, associated with PP production.

Regarding the increase in PP production, it should be noted that Stepan is not making any physical changes to the permitted equipment or requesting any new equipment to increase the production level ("maximum possible production"). The only operational change (shorter batch time) is described below by the applicant:

> Stepan's polyester polyols manufacturing is a batch process, not continuous. Prior to the sale to Stepan, the fastest batch times were such that maximum production was 60 k[M]T polyol/year, which was never realized due to a multitude of reasons mainly demand. The new Stepan products are very chemically similar to the historical "Terates" that have been produced at the site for many years, and they use the same or similar raw materials. The main difference is the Stepan products have much faster batch times. The faster batch times allow more production in the same period. There are no physical changes necessary other than some minor piping connections to keep products separate.

For the changes described above, this application review will include the discussions on applicability of 02D .1111 (Maximum Achievable Control Technology), 02Q .0317 (Avoidance of PSD), and 02Q .0315 "Synthetic Minor Facilities".

15A NCAC 02D .1111 "Maximum Achievable Control Technology"

As stated above, the facility is currently required to comply with the major source requirements in §112 of Clean Air Act (CAA) for HAP emissions (i.e., MACT, 40 CFR 63 Subpart FFFF "National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing"). But, as stated above, with the change in major to area source classification, the facility will be required to comply with the area source requirements in CAA §112 (i.e., 40 CFR 63, Subpart VVVVVV, "National Emission Standards for Hazardous Air Pollutants for Chemical Manufacturing Area Sources"). All applicable requirements under this Subpart are discussed below:

§63.11494(a) and (b) - Applicability

The facility is subject to this Subpart because it owns a chemical manufacturing process unit (CMPU) which is located at an area source of HAPs that generates as a byproduct at least one Table 1 organic HAP (such as acetaldehyde) at an individual concentration of at least 0.1 percent by weight.

The CMPU is defined as "all process vessels, equipment, and activities necessary to operate a chemical manufacturing process that produces a material, or a family of materials described by North American Industry Classification System (NAICS) code 325. A CMPU consists of one or more unit operations and any associated recovery devices. A CMPU also includes each storage tank, transfer operation, surge control vessel, and bottoms receiver associated with the production of such NAICS code 325 materials."

The CMPU for the Stepan facility produces a family of materials described by NAICS code 325 and is located at an area source of HAPs. It includes the following emissions sources and control devices:

One Chemical Manufacturing Process Unit (CMPU)

- Reactor (ID No. R7100A) via reactor reflux column with vent condenser **(ID No. A-7100-2A)** via cooling vessel **(ID No. T-7100-4A)**
- Reactor **(ID No. R-7100B)** via reactor reflux column with vent condenser **(ID No. A-7100-2B)** via cooling vessel **(ID Nos. T-7100-4B/T7105)**

[7] Section 7.1 Organic Liquid Storage Tanks, 6/20.
[8] Section 6.11, Terephthalic Acid, 5/83 (Organic Chemical Process Industry).
[9] WATER9.

- Reactor **(ID No. R-7100C)** via reactor reflux column with vent condenser **(ID No. A-7100-2C)** via cooling vessel **(ID No. T-7100-4C)**
- Reactor **(ID No. R-7100D)** via reactor reflux column with vent condenser **(ID No. A-7100-2D)** via cooling vessel **(ID No. T-7100-4D)**
- Evaporators **(ID Nos. E-7103 and A-7010/T-7010-4)**
- Molten feed tank **(ID No. T-7102)**

  All above via VOC catch tank **(ID No. T-7100-12)** and emissions controlled via a flare **(ID No. G-1955)**.

- Process water distillation columns and reflux tanks **(ID No. A-6105/ID No. T-6105-5 and ID No. A-7230/ ID No. T7230-7)** all via VOC catch tank **(ID No. T-7100-12)** and emissions controlled via a flare **(ID No. G-1955)**.
- Process water tanks **(ID Nos. T-6101-6 and T-1939AR)**
- Storage tanks **(ID Nos. T-6516B, T-7003, T-7001, T-7002-A, T-7002-B, and T-7002-C)**
- Process equipment leaks **(ID No. RESEQLK)**.
- Insignificant process equipment **(ID Nos. ICT-1, IH7905, IH7907, IR01, IR02, IR03, IR04, IR05, IRAW, IRESTRAN, IT12, IT1219, IT1220, IT130026R, IT19351, IT1955, IT1964, IT1991, IT5400, IT5420A-C, IT5700, IT6109R, IT6311, IT6409R, IT6417, IT64173, IT6419, IT6516A, IT6900, IT7000, IT70012, IT70013, IT70015, IT7004, IT7005, IT7006, IT7007, IT7008, IT7009, IT7011, IT7014, IT7016, IT7017, IT7019, IT7101, IT71024, IT71044, IT7104A-B, IT7200, IT7230-10, and ICLRMU)**.

Onsite Wastewater Treatment System for CMPU

- Wastewater equalization open top tanks **(ID Nos. T-1922C and T-1922D)**.
- Wastewater equalization fixed roof tank **(ID No. T-1922E)**.
- #2 Aeration Basin **(ID No. T-1941)**.
- Wastewater treatment plant #2 clarifier **(ID No. IS19341)**.
- Wastewater treatment plant #3 clarifier **(ID No. IS1959)**.
- Wastewater treatment plant reactor clarifier **(ID No. IS1985)**.

Wastewater Loading for Offsite Treatment for CMPU

- Wastewater submerged truck loading **(ID No. WW Truck Loading)** with emissions controlled via a flare **(ID No. G-1955)**.

As per the Permittee, acetaldehyde is believed to be generated as a byproduct of reaction or present in raw materials at trace levels as it is present in the condensed overhead stream from the reactors. Numerous data have been collected on the concentration of HAP in the overhead streams at the facility, and the highest acetaldehyde concentration that has been measured in the liquid phase has been 2,010 ppmw (0.201% by weight). This was measured in the condensed overhead waste stream from the distillation column A-7230 at the pump that sends the liquid to the tank truck for off-site waste disposal. Thus, it exceeds the applicability threshold of 0.1 percent by weight.

§63.11494(d) - Extent of Affected Source

This Subpart applies to each new or existing affected source. The affected source is the facility-wide collection of CMPUs, and each heat exchange system and wastewater system associated with each CMPU that meets the applicability criteria described above. Since the CMPU for the Stepan facility is using only Table 1 organic HAP (such as acetaldehyde), it only needs to control total CAA §112(b) organic HAP.

§63.11494(d) and (f) - Existing Source v. Compliance Date

The affected source of Stepan facility is an existing source because it commenced construction before October 6, 2008. Typically, existing sources for 6V NESHAP are required to comply no later than March 21, 2013. But, since the facility is being reclassified from major to area source through this Title V permit revision and the compliance date above has passed, Stepan will be required to demonstrate compliance with the 6V NESHAP requirements immediately upon the permit issuance, consistent with the MM2A rulemaking in §63.1(c)(6)(A).

Stepan also must provide the EPA any change to the information already provided under §§63.9(b) and 63.9(j). The filing of this application for reclassification to area source meets the above notification requirement for the change in information already provided, consistent with §63.9(j).

§63.11494(e) - Title V Permitting

The Stepan facility has installed a federally-enforceable control device (e.g., flare) on the CMPU described above to keep the facility HAP emissions at area source levels (≤10/25 tons/yr). Thus, the facility will be required to continue holding the Title V permit. The processing of the application will allow the DAQ to issue a permit revision including this area source requirements in 6V NESHAP.

§63.11495 - Management Practices and Other Requirements

In accordance with §63.11495(a), the Permittee is subject to the following management practices for the CMPU:

- Each process vessel must be equipped with a cover or lid that must be closed at all times when it is in organic HAP service or metal HAP service, except for manual operations that require access, such as material addition and removal, inspection, sampling and cleaning.

- The Permittee must use any of the methods listed below to control total organic HAP emissions from transfer of liquids containing Table 1 of the Subpart organic HAP to tank trucks or railcars.

    - Use submerged loading or bottom loading.
    - Route emissions to a fuel gas system or process in accordance with §63.982(d) of subpart SS.
    - Vapor balance back to the storage tank or another storage tank connected by a common header.
    - Vent through a closed-vent system to a control device.

- The Permittee must conduct inspections of process vessels and equipment for each CMPU in organic HAP service or metal HAP service to demonstrate compliance and to determine that the process vessels and equipment are sound and free of leaks.

- The Permittee must repair any leak within 15 calendar days after detection of the leak, or document the reason for any delay of repair, meeting the requirements in §63.11495(a)(4).

- The Permittee must keep records of the dates and results of each inspection event, the dates of equipment repairs, and, if applicable, the reasons for any delay in repair, in accordance with §63.11495(a)(5).

According to §63.11495(b), for each heat exchange system subject to this Subpart with a cooling water flow rate less than 8,000 gallons per minute (gal/min) and not meeting one or more of the conditions in §63.104(a), the owner/operator is required to comply with the requirements of development of inspection plan and operating the facility accordingly, performance of repairs to eliminate leaks, and record keeping for dates and results of such inspections.

The heat exchange system at the Stepan facility is operated with the minimum pressure on the cooling water side at least 35 kilopascals greater than the maximum pressure on the process side. Thus, it meets at least one condition in §63.104(a). Therefore, the requirement in §63.11495(b) do not apply.

Consistent with §63.11495(c), startup, shutdown, and malfunction (SSM) provisions in Subparts that are referenced in paragraphs in §63.11495(a) and (b) do not apply.

Consistent with §63.11495(d), at all times, the Permittee must operate and maintain any affected CMPU, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions.

§63.11496 - Standards and Compliance Requirements for Process vents

Pursuant to §63.11496, the owner/operator is required to comply with the requirements in §63.11496(a) for organic HAP emissions from batch process vents for each CMPU subject to this Subpart using Table 1 organic HAP. If uncontrolled organic HAP emissions from all batch process vents from a CMPU subject to this Subpart are equal to or greater than 10,000 pounds per year (lb/yr), the owner/operator is required to comply with the emission limits and other requirements in Table 2 to this Subpart. The process vents at Stepan's CMPU are not batch process vents, they are continuous process vents (see next paragraph); so, the requirements in §63.11496(a) do not apply.

The Permittee is required to comply with the requirements in §63.11496(b) for organic HAP emissions from continuous process vents for each CMPU subject to this Subpart using Table 1 organic HAP. If the total resource-effectiveness (TRE) index value for a continuous process vent is less than or equal to 1.0, the Permittee must also comply with the emission limits and other requirements in Table 3 to this Subpart. Since the Permittee is controlling organic HAP emissions per Table 3 to the Subpart (by routing closed vent emissions to a flare), determination of TRE is not required consistent with pursuant to §63.11496(b)(1)(i).

Consistent with §63.11496(c), if the Permittee combines organic HAP emissions from batch process vents and continuous process vents, he/she must comply with the more stringent standard in Table 2 or Table 3 to this Subpart that applies to any portion of the combined stream, or he/she must comply with Table 2 for the batch process vents and Table 3 for the continuous process vents. This requirement does apply as per the applicant although the facility does not have batch process vents.

Requirements in §63.11496(d) for halogenated streams do not apply to Stepan facility because the emission stream does not contain halogens compounds.

Requirements in §63.11496(e) do not apply regarding the exceptions to the requirements for the alternative standard requirements in Tables 2 and 3 to this Subpart and §63.2505, because the Permittee is not intending to comply with alternate standard in Tables 2 or 3.

Requirements in §63.11496(f) for emissions from metal HAP process vents do not apply as the Stepan's CMPU is to emit only the organic HAP emissions and not metal HAP emissions.

Consistent with §63.11496(g) and because the Permittee is complying with the emission limits and other requirements for continuous process vents in Table 3 to this Subpart, the provisions in paragraphs (g)(1) through (7) and (9) of this Section apply in addition to the provisions in 40 CFR part 63, subpart SS.

Consistent with §63.11496(h), for each surge control vessel and bottoms receiver that meets the applicability criteria for storage tanks specified in Table 5 to this Subpart, the Permittee shall meet the emission limits and control requirements specified in Table 5 to this Subpart.

As per the Permittee, the facility does not have a tank that collects bottoms from either distillation operation. Even if Stepan does collect, the bottoms from any distillation operation, those would not contain more than a few ppm of HAP. The HAP (mainly 1,4 dioxane) comes off the top of the first distillation column and goes directly into the tank truck for shipment with no storage in between. In addition, the facility does not have any surge control vessels as defined in this regulation.

In accordance with §63.11496(i), references to SSM provisions in Subparts that are referenced in paragraphs (a) through (h) of §63.11496 or Tables 2 through 5 to this Subpart do not apply.

§63.11497 - Standards and Compliance Requirements for Storage Tanks

The emission limits and other requirements in Table 5 to this Subpart and in paragraph (b) of this Section for organic HAP emissions apply if the storage tank meets the applicability criteria in Table 5 to this Subpart.

Each of the permitted tanks is listed in Table 5-3 below:

Table 5-3 Storage Tanks

Unit ID	Description	Design Capacity	Vent Configuration	Proposed Applicable Regulation(s)
CMPU Emission Sources				
R7100A-D and associated equipment	Polyester polyols reactors, reflux columns and cooling tanks	60,000 metric tonnes throughput	Flare	GACT 6V Continuous Process Vent, Table 3.1.b.
T-7102	Molten Feed Tank	8,000 gal	Flare	GACT 6V Continuous Process Vent, Table 3.1.b.
T-7002-A,B,C	Raw Material Fixed-Roof Storage Tanks	30,292 gal (MTVP of Total Organic HAP < 0.02psi [0.14kPa])	ATM or ATM via S-7001-4 (scrubber)	GACT 6V Storage Tank; No Table 1 HAP
T-7001	Raw Material Fixed-Roof Storage Tank	30,000 gal (MTVP of Total Organic HAP <0.39 psi [0.14kPa])	ATM or ATM via S-7001-4 (scrubber)	GACT 6V Storage Tank; No Table 1 HAP
T-7003	Fixed Roof Storage Tank	32,000 gal (MTVP of Total Organic HAP <0.39 psi [0.14kPa])	ATM	GACT 6V Storage Tank; No Table 1 HAP
T-1939AR	Polyester Polyols Process Water Tank	100,000 gal (MTVP of Total Organic HAP <0.02 psi [0.14kPa])	ATM	GACT 6V Storage Tank
T-6101-6	Polyester Polyols Process Water Tank	22,000 gal (MTVP of Total Organic HAP <0.02 psi [0.14kPa])	ATM	GACT 6V Storage Tank
A-7230 T-7230-7	Process Water Distillation Column and Reflux Tank	2,600 gal	Flare	GACT 6V Continuous Process Vent, Table 3.1.b.
A-6105 T-6105-5	Process Water Distillation Column and Reflux Tank	1,175 gal	Flare	GACT 6V Continuous Process Vent, Table 3.1.b.
T-6516B	Recycle Tank	20,000 gal	ATM	Contains HAP only as impurities; not a GACT 6V Storage Tank
T-6109R	Raw Material Tank	20,000 gal (no HAP)	None	GACT 6V Storage Tank; No Table 1 HAP
Wastewater Truck Loading	Distilled Reactor Overheads Wastewater Truck Loading	325 gpm	Flare	GACT 6V Wastewater System (Table 6.1.)
T-1922C and T-1922D	Two wastewater equalization open top tanks	2,000,000 gal each	Open top	GACT 6V Wastewater System (Table 6.1.)
T-1941	#2 Aeration Basin	-	Open top	GACT 6V Wastewater System (Table 6.1.)
Control Device/Utilities				
G-1955	Polyester Polyols Flare	20 million Btu/hr	N/A	GACT 6V Control Device §63.982(b)
ICT-1	Polyester Polyols Cooling Tower	3,750 gpm	ATM	GACT 6V Exempt Heat Exchange System §63.11499

The table above details the storage capacity and the maximum true vapor pressure (MTVP) of its contents. Storage tank control device requirements in Subpart 6V are only applicable for storage tanks with at least 20,000 gallons design capacity that are storing Subpart 6V Table 1 HAPs with total organic HAP MTVPs at least 5.2 kPa. There are only two tanks at the facility over 20,000 gallons that store a mixture containing acetaldehyde (Table 1 HAP). Those are T-1939AR and T-6101-6, both of which store the same process water stream with a MTVP of organic HAP of approximately 0.14 kPa, which is much less than the lowest vapor pressure threshold for control, 5.2kPa. Therefore, no storage tank at the facility requires any add-on control devices. In summary, none of the storage tanks is required to comply with the standards and compliance requirements in §63.11497.

§63.11498 - Standards and Compliance Requirements for Wastewater Streams

In accordance with §63.11498(a), the Permittee must comply with the requirements therein and in Table 6, Item 1 to this Subpart for all wastewater streams from a CMPU subject to this Subpart.

If the partially soluble HAP concentration in a wastewater stream is equal to or greater than 10,000 parts per million by weight (ppmw) and the wastewater stream contains a separate organic phase, then the requirements in Table 6, Item 2 to this Subpart also apply for that wastewater stream. Partially soluble HAP are listed in Table 7 to this Subpart.

In all cases, except where the wastewater stream is hard piped to a combustion unit or hazardous waste treatment unit, as specified in Table 6, Item 2.b to this Subpart, the owner/operator is required to determine the total concentration of partially soluble HAP in each wastewater stream using process knowledge, engineering assessment, or test data. The Permittee must reevaluate the concentration of partially soluble HAP if he/she makes any process or operational change that affects the concentration of partially soluble HAP in a wastewater stream.

The facility generates wastewater in the CMPU. Process water is initially generated in the reactors, condensed, and stored in the fixed roof polyester polyols process water tanks T-1939AR and T-6101-6, prior to distillation in column A-7230 and then column A-6105. There are two wastewater streams that are discharged from the CMPU. One stream is the distillation column A-7230 overhead stream that contains concentrated impurities such as 1,4 dioxane which is sent directly to a tank truck for disposal as a hazardous waste. The other wastewater stream is the distillation column A-6105 overheads, contains low HAP concentrations, and is sent to the onsite wastewater treatment plant.

For the wastewater stream from the A-7230 overheads, the partially soluble HAP present are acetaldehyde, acrolein, and benzene. Numerous sampling activities have been conducted over the past two years for this stream. The maximum acetaldehyde concentration was found to be 2,010 ppmw, acrolein concentrations have been found only below detection levels, 25 ppmw, and the highest benzene concentration detected has been 22.5 ppmw. Using these maximum concentrations, the total partially soluble HAP concentration in this wastewater stream is 2,057.5 ppmw. It should be noted that 1,4 dioxane is not a partially soluble HAP listed in Table 7 of Subpart VVVVVV.

For the wastewater stream from the A-6105 overheads, the partially soluble HAP believed to be present are acetaldehyde, acrolein, and benzene. Numerous sampling activities have been conducted over the past two years for this stream. The maximum acetaldehyde concentration was found to be 7.07 ppmw, and acrolein and benzene concentrations have not been detected above minimum detection levels, the highest being 5 ppmw. Using these maximum concentrations, the total partially soluble HAP concentration in this wastewater stream is not over 17.07 ppmw.

Since the total partially soluble HAP concentration in both these streams is less than 10,000 ppmw, the stream must comply only with Table 6, Item 1 (and not Item 2), which requires discharge to onsite or offsite wastewater treatment or hazardous waste treatment and maintaining records identifying each wastewater stream and documenting the type of treatment that it receives. The A-7230 overheads stream is shipped offsite as hazardous waste and used for energy recovery while being combusted. The A-6105 stream is sent to the onsite waste treatment system which uses aerobic biodegradation for treatment.

References to SSM provisions in Subparts that are referenced in §63.11498(a) or Table 6 to this Subpart do not apply.

§63.11499 - Standards and Compliance Requirements for Heat Exchange Systems

Consistent with §63.11499(a), if the cooling water flow rate in a heat exchange system is equal to or greater than 8,000 gal/min and is not meeting one or more of the conditions in §63.104(a), then the Permittee must comply with one of the requirements specified in Table 8 to this Subpart.

As previously stated, the heat exchange system utilized in the CMPU meets the exemption condition in §63.104(a)(1) and is therefore exempt from the monitoring requirements in Table 8 of Subpart VVVVVV. Specifically, the heat exchange system for the CMPU is operated with the minimum pressure on the cooling water side at least 35 kilopascals greater than the maximum pressure on the process side. In summary, §63.11499 does not apply to the CMPU.

§63.11501 - Notification, Recordkeeping, and Reporting Requirements

- According to §63.11501(a), the Permittee must meet the requirements of the General Provisions in 40 CFR Part 63, Subpart A, as shown in Table 9 to this Subpart. The General Provisions in other parts do not apply except when a requirement in an overlapping standard, which the Permittee determined is at least as stringent as Subpart VVVVVV and with which the Permittee has opted to comply, requires compliance with general provisions in another part.

- Per §63.11501(b), the facility must submit the Notification of compliance status (NOCS) required in §63.9(h), containing the information as below:

    - The certification signed by the RO certifying that the facility complies with the management practices in §63.11495, process vents requirements in §63.11496, surge control vessels, bottoms receivers and storage tanks requirements in §63.11497, wastewater streams requirements in §63.11498, and heat exchange systems requirements in §63.11499. The facility has complied with this requirement by submitting the NOCS as part of this application.

    - If the Permittee establishes an operating limit for a parameter that will not be monitored continuously in accordance with §§63.11496(g)(4) and 63.2450(k)(6), the Permittee is required to provide the information as specified in §§63.11496(g)(4) and 63.2450(k)(6). The Permittee only uses flare for compliance. Thus, this requirement does not apply.

    - A list of all transferred liquids that are reactive or resinous materials, as defined in §63.11502(b). The facility does not use any liquids which are reactive or resinous.

- Per §63.11501(c), the Permittee must maintain files of all information required by this Subpart for at least 5 years following the date of each occurrence according to the requirements in §63.10(b)(1). If the Permittee is subject, he/she must comply with the recordkeeping and reporting requirements of §63.10(b)(2)(iii) and (vi) through (xiv), and the applicable requirements specified in paragraphs (c)(1) through (8) of this Section, as below:

    - For each CMPU, the Permittee shall keep records of

        - Management practice inspections, repairs, and reasons for any delay of repair, as specified in §63.11495(a)(5).

        - Records identifying wastewater streams and the type of treatment they receive, as specified in Table 6 to this subpart.

        - Records of the date, time, and duration of each malfunction of operation of process equipment, control devices, recovery devices, or continuous monitoring systems used to comply with this subpart that causes a failure to meet a standard. The record must include a list of the affected sources or equipment, an estimate of the volume of each regulated pollutant emitted over the standard, and a description of the method used to estimate the emissions.

        - Records of actions taken during periods of malfunction to minimize emissions in accordance with §63.11495(d), including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation.

- For continuous process vents subject to Table 3 to this Subpart, when emissions are routed to a flare, the Permittee shall keep records of the flare compliance assessment, as specified in §63.998(a)(1)(i), keep records of the pilot flame monitoring, as specified in §63.998(a)(1)(ii) and (iii), and keep records of the closed-vent system, as specified in §63.998(d)(1).

- For continuous process vents subject to Table 3 to this Subpart, the Permittee must keep records of the occurrence and duration of each startup and shutdown of operation of process equipment, or of air pollution control and monitoring equipment.

- The Permittee shall submit a semiannual compliance report that contain the information specified in paragraphs (d)(1) through (7) of §63.11501, as applicable. Reports are required only for semiannual periods during which the Permittee experienced any of the events described in paragraphs (d)(1) through (8) of §63.11501.

    - The Permittee shall clearly identify any deviation from the requirements of this Subpart.

    - The Permittee must provide the following information for each delay of leak repair beyond 15 days for any process equipment, storage tank, surge control vessel, bottoms receiver, and each delay of leak repair beyond 45 days for any heat exchange system with a cooling water flow rate less than 8,000 gal/min: information on the date the leak was identified, the reason for the delay in repair, and the date the leak was repaired.

    - The Permittee must report each process change that affects a compliance determination and submit a new certification of compliance with the applicable requirements in accordance with the procedures specified in paragraph (b) of §63.11501.

    - If a malfunction occurred during the reporting period, the report must include the number of instances of malfunctions that caused emissions in excess of a standard. For each malfunction that caused emissions in excess of a standard, the report must include a list of the affected sources or equipment, an estimate of the volume of each regulated pollutant emitted over the standard, and a description of the method used to estimate the emissions. The report must also include a description of actions you took during a malfunction of an affected source to minimize emissions in accordance with §63.11495(d), including actions taken to correct a malfunction.

- According to §§63.997(b)(2) 63.999(a)(1)(iii), the Permittee has submitted on February 2, 2022 a waiver request for performance of the required, initial flare compliance assessment in §63.987(b)(1). The request includes information justification for such waiver including technical infeasibility, or the impracticality, of the flare compliance assessment. If approved by the DAQ, the Permittee is not required to conduct initial flare compliance assessment.

<u>15A NCAC 02Q .0317 "Avoidance Condition for PSD"</u>

First, regarding the proposed changes, it should be emphasized that the current permit (before the modification) does not include any production level limit (such as 60,000 metric tonnes of PP production) or an operational limit (such as hours of operation) to ensure compliance with any applicable requirement under CAA. Specifically, the facility does not hold a Title V permit, containing PSD major modification requirements for any previous projects, restricting the facility production level to 60,000 metric MT PP, or limiting its operating hours. Thus, increasing the production level to 175,000 MT ("maximum possible production") without any "construction (which also includes "modification"), based on the shorter batch times, as discussed previously, is not considered a "physical change or change in the method of operation", pursuant to §51.166(b)(2)(iii)(f). As such PSD major modification review provision does not apply.

Regarding PSD, the facility will remain a minor (synthetic minor) source after modification in the context of 100 tons/yr major source classification under the "chemical process plants" industrial category for emissions of CO, NOx, and SO_2. Refer to Table 5-1 above for the PTE for these pollutants' emissions. For the above pollutants, the current

permit requires the Permittee to keep the fuel usage records for natural gas, propane and fuel oil, and fuel oil supplier certification records, monitoring of emissions on a monthly basis, and reporting on a semi-annual basis the monthly emissions for the previous 17 months of period.

In addition to CO, NOx, and SO_2, the emissions of VOC will remain below the major source threshold of 100 tons per year with the operation of the existing flare and fuel usage monitoring. Specifically, the facility wide before-control and after-control emissions rates are 272.54 tons/yr and 80.5 tons/yr, respectively. Thus, a synthetic minor limitation for PSD is required and will be included for VOC as well.

The following monitoring/record keeping requirements will be included in the Title V permit to ensure compliance:

- The Permittee shall keep monthly operational records in a logbook (written or electronic format), as follows:

    - the total quantity (in million standard cubic feet) of natural gas, and propane, fired in the affected sources;
    - the total quantity (in 1,000 gallons) of fuel oil fired and organic byproduct in the affected sources;
    - the fuel oil supplier certifications for any fuel oil fired in the affected sources, including the sulfur content of the fuel oil (in percent by weight);
    - the total amount of each type of VOC-containing material consumed; and
    - the total amount of polyester polyols produced.

- Each month, the Permittee shall calculate the facility-wide emissions of CO, NOx, SO_2, and VOC during the previous calendar month and during the previous consecutive 12-months. The emissions estimations shall include all affected emission sources, including, but not limited to, all chemical processes, combustion sources, storage tanks, wastewater treatment, remediation activities, fugitive emissions, and material handling. Acceptable emissions estimation methodologies include:

    - Engineering estimates for chemical operations, based on chemical properties, operating conditions, and production rates;
    - US EPA-approved emission factors for fuel combustion (i.e., AP-42 emission factors);
    - US EPA-approved emissions factors for chemical storage operations (i.e., AP-42 emission factors); and
    - Either TOXCHEM or US EPA-approved WATER9 software for wastewater treatment operations.

    The results of the monthly and 12-month rolling emissions calculations shall be recorded in a logbook (written or electronic format) and made available to the DAQ upon request.

As discussed previously, the existing flare for the Stepan facility is a "federally enforceable control device" pursuant to 6V NESHAP and its operation is needed to reduce the HAP emissions below the major source thresholds (10/25 tons per year). The operation and maintenance requirements for this control device under the area source NESHAP (6V) will also limit the emissions of VOC below the major source threshold (100 tons per year), because the organic HAPs (acetaldehyde, acrolein, benzene, 1-4 dioxane, etc.) controlled by the flare are also VOCs.

Finally, the Permittee will be required to submit semi-annual summary reports for each 6-month period, consisting of the monthly emissions of CO, NOx, SO_2, and VOC for each of the previous 17 months; and the consecutive 12-month period emissions of CO, NOx, SO_2, and VOC for each of the six months of the calendar half.

<u>15A NCAC 02Q .0315 "Synthetic Minor Facilities"</u>

For the Title V program standpoint, for all criteria pollutants, the facility will remain a synthetic minor facility (i.e., PTE for CO, NOx, SO_2, and VOC each < than the major source threshold of 100 tons/yr) due to the above limitations for avoiding the PSD applicability. Regarding the HAPs, the PTE are as follows:

Before control/limitations and After control/limitations:

Single HAP
167.58 tons/yr (single largest HAP 1,4-dioxane) and 3.75 tons/yr (single largest HAP hexane)

Aggregate HAPs
176.3 tons/yr (total) and 6.4 tons/yr (total)

In summary, synthetic minor limits to avoid Title V will be included in the permit for CO, NOx, SO_2, VOC, and single and total HAP emissions. The monitoring including record keeping and reporting requirements for CO, NOx, SO_2, and VOC, pursuant to PSD avoidance, as above, shall be sufficient to keep the emissions below the Title V major source threshold for these pollutants.

For HAPs, the following monitoring including record keeping requirements will be included in the Title V permit:

- Individual HAP Emissions - Each month the Permittee shall calculate the facility-wide emission rates of each individual HAP during the previous calendar month and during the previous consecutive 12-months. The emissions estimations shall include all HAP emission sources, including but not limited to all chemical processes, combustion sources, storage tanks, wastewater treatment, remediation activities, fugitive emissions, and material handling. Acceptable emissions estimation methodologies include:

  - Engineering estimates for chemical operations, based on chemical properties, operating conditions, and production rates;
  - US EPA-approved emission factors for fuel combustion (i.e., AP-42 emission factors);
  - US EPA-approved emission factors for chemical storage operations (i.e., AP-42 emission factors); and
  - Either TOXCHEM or US EPA-approved WATER9 software for wastewater treatment operations.

  The results of the monthly and 12-month rolling emissions calculations shall be recorded in a logbook (written or electronic format).

- Total (Aggregate) HAP Emissions - Each month, the Permittee shall calculate the facility-wide emission rate of total (aggregate) HAPs during the previous calendar month and during the previous consecutive 12-months. The results of the monthly and 12-month rolling emissions calculations shall be recorded in a logbook (written or electronic format).

The Permittee will be required to report semi-annually for each consecutive 12-month period the highest individual (single) HAP emission rate (in tons per consecutive 12-months) and state the identity of the highest emitting HAP, and the total (aggregate) HAPs emission rate (in tons per consecutive 12-months).

Finally, as discussed earlier, pursuant to 6V NESHAP, the existing flare is a "federally-enforceable control device" for keeping the facility's HAPs emissions below the major source thresholds of 10 tons per year (single HAP) and 25 tons per year (aggregate HAP). The flare requirements for the area source NESHAP shall also be sufficient to comply with the avoidance limit for VOC, single HAP, and aggregate HAPs, for Title V purpose. As stated earlier in this review, the facility will still be required to hold/obtain a Title V permit pursuant to the area source NESHAP requirement.

6. NSPS, NESHAPS, PSD, Attainment Status, 112(r), and CAM

NSPS

The changes requested in this application do not result in applicability of any New Source Performance Standards (NSPS).

NESHAP/MACT

Section 5 above includes the discussions of the applicable NESHAP Subpart 6V.

PSD

Refer to Section 5 above on PSD applicability.

Attainment Status

New Hanover County is currently in attainment or unclassifiable/attainment for all NAAQSs. The minor source baseline date is triggered for this airshed for SO_2, PM_{10}, and NOx. This modification will result in an increase in 2.26 pounds per hour of SO_2, 0.33 pounds per hour of PM_{10}, and 2.65 pounds per hour of NOx.

112(r)

This facility is not subject to Section 112(r) of the Clean Air Act. Because it does not store any regulated substance in quantities above the regulatory thresholds.

CAM

CAM applicability is generally required to be addressed through processing of renewal and significant modification applications. This application is a significant modification application. CAM requirements apply to each major source as defined in Title V program (for example §70.2). As discussed in detail above, the facility will become a synthetic minor after this permit revision for the Title V purpose, as discussed above; thus, the CAM requirements do not apply.

7. Facility Wide Air Toxics

The facility was previously subject to the NC's air toxics requirements (02Q.0700 and 02D .1100), but it is not subject to at the present time.

First, the facility is updating the wastewater parameters affecting the acetic acid emissions. The wastewater system at the Stepan facility is associated with the CMPU; however, the facility also receives wastewater from a neighboring facility FORTRON for treating in the onsite wastewater treatment system. FORTRON's wastewater chiefly contains acetic acid, and it is useful for Stepan's aerobic treatment process since it provides organic material ("food") for the microorganisms. The following Table 7-1 provides the updated acetic emissions:

Table 7-1 Acetic Acid Emissions

Emission Source	Potential Emission Rate, lb/hr	Toxic Pollutant Emission Rate (TPER), lb/hr
Wastewater equalization tank T1922D or T1922E	1.387	3.90
Wastewater equalization tank T1922C	0.142	
#2 Aeration basin	0.003	
Clarifier	0.001	
Total	1.53	

The emissions points of acetic acid in the wastewater system are all unobstructed (no ran caps or flaps) and are vertically oriented. They are area sources (and not point sources). For example, tanks T1922D and T1922C are open-top tanks, and the aeration basin and clarifier are not covered. There are also other sources of acetic acid emissions, but they have relatively negligible emissions (0.003 lb/hr collectively from G1955, RESLEQ, T1939, and T-6101-6). Accounting those negligible emissions will not change the outcome that the facility-wide acetic acid emission does not exceed the associated TPER.

Second, as stated previously, the application includes a request to increase the facility's production level to 175,000 metric tonnes. However, no physical changes or change in the method of operation are requested to accomplish this increased production; so, it can be argued that even for NC-regulated air toxics, "modification" provision, as defined in 02Q .0703(14), is not triggered. Regardless, the following provides an analysis pursuant to 02Q .0706 "modification" provision:

Table 7-2 below includes a facility-wide emission summary on a PTE basis for the regulated air toxics, which includes emissions of both exempt (such as NESHAP subject engines, flare, and CMPU) sources, per 02Q .0727(a)(27), and non-exempt sources (boilers and process heater). Based on this summary, emissions of ammonia, arsenic, benzene, beryllium, cadmium, formaldehyde, and nickel exceed the associated toxic pollutant emissions rates (TPERs) for the unobstructed stacks included in 02Q .0711.

Table 7-2 PTE for NC-regulated Air Toxics Pollutants

Title of PTE (lb/yr)																																
Pollutant	B7600	BLR1	BLR5	EG125	EG20	FP-1500-E-H	G1955	IA	RESEQUE	T1922C	T1922D	T1922E	T1939	T1941	T-6101-6	T-6516B	T-7001	T-7002-A	T-7002-B	T-7002-C	T-7003	#2 Clarifier	Total			Total lb/hr	Total lb/hr	TPER	Units	Comments
1,3 Butadiene				0.007	0.001	0.012																	0.020			5.49843E-05	0.000	40.585	lb/hr	only from exempt sources
1,4 Dioxane								22.100	423.285	111.240	132.097		211.360	0.000	76.400								**976.482**			**2.675293463**	**0.111**	**21.600**	**lb/day**	**only from exempt sources**
Acenaphthene	0.000	0.003	0.004				0.000																0.007			2.05474E-05	0.000	N/A		
Acenaphthylene	0.000	0.003	0.004				0.000																0.007			2.05474E-05	0.000	N/A		
Acetaldehyde	**2.911**	**26.468**	**32.555**	**0.164**	**0.026**	**0.293**	**2.647**		**62.736**	**41.715**	**62.572**		**13.700**		**4.950**								**250.728**			**0.686953176**	**0.029**	**26.410**	**lb/hr**	**only from exempt sources**
Acetic Acid									**2.326**	**9,337.203**	**9,643.113**	**0.000**	**0.610**	**27.810**	**0.220**							**27.810**	**19,039.091**	* Not a HAP/TAP only		**52.1618945 1**	**2.173**	**3.900**	**lb/hr**	
Acrolein	**3.456**	**31.420**	**38.646**	**0.020**	**0.003**	**0.035**	**3.142**		**0.001**	**76.477**	**118.192**												**271.393**			**0.743542952**	**0.031**	**0.080**	**lb/hr**	**only from exempt sources**
Aldehydes				38.806	6.209	69.450																	114.465			0.313602058	0.013	N/A		
Ammonia	**1,117.217**	**10,156.522**	**12,492.522**							**535.342**	**1,008.112**			**6.952**									**25,316.648**	* Not a HAP/TAP only		**69.36073321**	**2.890**	**2.840**	**lb/hr**	**94% from liquid fuel combustion (exemp**
Anthracene	0.000	0.004	0.005				0.000																0.010			2.73965E-05	0.000	N/A		
Arsenic (As)	0.771	7.008	8.620				0.034																16.433			0.045021567	0.002	0.194	lb/yr	only from exempt sources
Benz(a)anthracene	0.000	0.003	0.004				0.000																0.007			2.05474E-05	0.000	N/A		
Benzene (Bz)	**3.840**	**34.913**	**42.943**	**0.199**	**0.032**	**0.356**	**0.359**		**0.787**				**0.017**		**0.006**			**1.370**					**84.822**			**0.232389591**	**0.010**	**11.069**	**lb/yr**	**only from exempt sources**
Benzo(a)pyrene	0.000	0.002	0.003				0.000																0.005			1.36982E-05	0.000	3.044	lb/yr	only from exempt sources
Benzo(b)fluoranthene	0.000	0.003	0.004				0.000																0.007			2.05474E-05	0.000	N/A		
Benzo(g,h,i)perylene	0.000	0.002	0.003				0.000																0.005			1.36982E-05	0.000	N/A		
Benzo(k)fluoranthene	0.000	0.003	0.004				0.000																0.007			2.05474E-05	0.000	N/A		
Beryllium (Be)	0.578	5.256	6.465				0.001																12.300			0.033698807	0.001	0.378	lb/yr	only from exempt sources
Cadmium (Cd)	0.578	5.256	6.465				0.188																12.487			0.03421062	0.001	0.507	lb/yr	only from exempt sources
Chromium (Cr) Trivalent	0.578	5.256	6.465				0.239																12.538			0.034350971	0.001	N/A		
Chrysene	0.000	0.003	0.004				0.000																0.007			2.05474E-05	0.000	N/A		
Cobalt (Co)	0.016	0.143	0.176				0.014																0.350			0.000958877	0.000	N/A		
Dibenz(a,h)anthracene	0.000	0.002	0.003				0.000																0.005			1.36982E-05	0.000	68.500	lb/hr	only from exempt sources
Dichlorobenzene	0.225	2.049	2.520				0.205																5.000			0.013698246	0.001	N/A		
Diethylene Glycol									4.327														4.327			0.011855683	0.000	N/A		
Ethylbenzene (Etz)	0.131	1.195	1.470				0.120																2.917			0.007990643	0.000	N/A		
Fluoranthene	0.001	0.005	0.006				0.001																0.012			3.42456E-05	0.000	N/A		
Fluorene	0.001	0.005	0.006				0.000																0.012			3.19626E-05	0.000	N/A		
Formaldehyde (Form)	85.188	774.415	952.555	0.384	0.061	0.687	12.807																1,826.117			5.003059845	0.208	0.160	lb/hr	only from exempt sources
HCl	2.387	21.516	26.464				2.152																52.499			0.143831579	0.006	0.740	lb/hr	only from exempt sources
Hexane	338.105	3,073.684	3,780.632				307.368																7,499.789			20.54738842	0.856	46.300	lb/day	only from exempt sources
Indeno(1,2,3-cd)pyrene	0.000	0.003	0.004				0.000																0.007			2.05474E-05	0.000	N/A		
Lead (Pb)	1.734	15.768	19.395				0.085																36.983			0.101321918	0.004	N/A		
Manganese (Mn)	1.156	10.512	12.930				0.065																24.663			0.067569778	0.003	1.300	lb/day	only from exempt sources
Mercury (Hg)	0.578	5.256	6.465				0.044																12.343			0.033817637	0.001	0.025	lb/day	only from exempt sources
Methyl Chloroform	0.471	4.286	5.272				0.429																10.458			0.028652164	0.001	505.400	lb/day	only from exempt sources
Methyl Ethyl Ketone									**0.002**														**0.002**			**6.83897E-06**	**0.000**	**151.800**	**lb/day**	**only from exempt sources**
Methylene Chloride	3.851	35.006	43.057				3.501																85.414			0.234011696	0.010	2,213.752	lb/yr	only from exempt sources
m-Xylene	0.175	1.591	1.958				0.159																3.883			0.010638971	0.000	113.700	lb/day	only from exempt sources
Naphthalene	0.465	4.228	5.200	0.018	0.003	0.032	0.104																10.050			0.02753485	0.001	N/A		
Nickel (Ni)	0.578	5.256	6.465				0.359																12.658			0.034678456	0.001	0.025	lb/day	only from exempt sources
o-Xylene	0.231	2.100	2.583				0.210																5.125			0.014040702	0.001	113.700	lb/day	only from exempt sources
Phenanthrene	0.003	0.029	0.036				0.003																0.071			0.000194058	0.000	N/A		
Phenol							9.135		0.004	6.952	6.952		0.001		0.004								23.049			0.063147094	0.003	1.000	lb/hr	only from exempt sources
Phosphorus (P)	0.396	3.603	4.432				0.360																8.791			0.024086082	0.001	N/A		
Phthalic Anhydride								**127.126**									**209.700**		**209.700**	**209.700**			**755.226**			**2.071850742**	**0.086**	**N/A**		
Polyaromatic Compounds (PACs)	24.231	220.281	270.945	0.358	0.057	0.641	22.028																538.542			1.475457127	0.061	N/A		
Polycyclic Organic Matter (POM)	4.609	41.896	51.532																				98.036			0.268591304	0.011	N/A		
Pyrene	0.001	0.009	0.011				0.001																0.021			5.70768-05	0.000	N/A		
Selenium (Se)	2.891	26.280	32.324				0.004																61.499			0.168491228	0.007	N/A		
Toluene	0.639	5.806	7.141	0.087	0.014	0.156	0.581																14.424			0.039516667	0.002	197.960	lb/day	only from exempt sources
Xylenes (mixed isomers)				0.061	0.010	0.109																	**0.179**	HAP TPY		**0.000491239**	**0.000**	**N/A**		
Maleic Anhydride																	**4.680**		**4.680**	**4.680**			14.040	**6.4**		0.038465753	0.002	113.700	lb/day	only from exempt sources
Ethylene Glycol																**0.050**					**0.050**		**0.100**			**0.000273973**	**0.000**	**0.025**	**lb/hr**	**only from exempt sources**

The following documents the facility's compliance status for these pollutants with the air toxics requirements:

Ammonia

The facility wide ammonia emission rate of 2.89 lbs/hr exceeds the applicable TPER of 2.84 lbs/day. The apportionment of emissions is as below: 89 percent from two "gas-fired" boilers (i.e., 6J NESHAP non-subject sources) and the remaining 11 percent from 6V NESHAP-subject CMPU and flare, and a non-NESHAP subject process heater.

The facility combustion sources, especially the boilers, are exempt from the 6J NESHAP applicability due to their "gas-fired" classification as memorialized as a permit term in the current permit in accordance with 02Q .0317. To be exempt from the requirements of this NESHAP, the facility boilers are allowed to burn liquid fuel only during periods of gas curtailment, gas supply interruption, startups, or for periodic testing, maintenance, or operator training on liquid fuel. Periodic testing, maintenance, or operator training on liquid fuel shall not exceed a combined total of 48 hours during any calendar year. However, the applicant accounted for emissions of the exempt boilers with an unrealistic assumption that the boilers will operate on fuel oil (and not on natural gas) for all 8760 hours creates. The Permittee contends that these unrealistic emissions due to fuel oil burning in boilers result in the facility-wide emissions exceeding the associated TPER for ammonia. If emissions for the boilers are considered only from the fuels that are expected to be burned realistically for 8760 hours in boilers, the facility wide emissions are expected to be much smaller and less than the TPER for ammonia (for example, natural gas combustion ammonia emission factor of 0.00314 lb/million Btu v. 0.0058 lb/million Btu for fuel oil combustion).

Arsenic

The facility wide arsenic emissions of 16.44 lbs/yr exceed the applicable TPER of 0.194 lb/yr. All arsenic emissions are from four combustion sources (two "gas-fired" boilers, one natural gas-fired heater, and one natural gas-fired flare).

The DAQ had previously evaluated the combustion source emissions from all sources existing at the time (boilers, heaters, flare, thermal oxidizer, and vaporizer), for the worst-case air toxic pollutant arsenic, and concluded on June 5, 2009 that the **"NCDAQ reviewed potential ambient air impacts from the combustion sources using AERMOD**

air dispersion modeling software and determined that potential impacts will not cause an acceptable ambient level (AAL) listed in 15A NCAC 02D .1104 to be exceeded beyond your property boundary". The applicant has argued that since that time (DAQ approval of June 5, 2009), there have been no additional combustion sources added, and many of those combustion sources included in that analysis were permanently shutdown and removed from the site shortly after. For the combustion sources that remain in use, there have been no changes to the type of fuel burned or combustor's heat input rate.

Beryllium

Beryllium emissions are to be emitted from the combustion sources only (two "gas-fired" boilers, one natural gas-fired process heater, and one natural gas-fired flare). The facility analyzed the combustion sources emissions pursuant to the "Director's Call" provision in 02Q .0712 in 2009, as discussed above. It appears that the DAQ chose arsenic as an "example" air toxic pollutant for all other air toxics from combustion sources to model, because the TPER for arsenic is lower than the other pollutants including metal TAPs. For example, 0.194 lb/yr (arsenic) vs. 0.378 lb/yr (beryllium) and emission factor is higher for arsenic than beryllium and other metal HAPs. Additionally, nearly all the emissions of beryllium (12.3 lb/yr) are associated with the fuel oil burning for 8760 hours annually, which is not a realistic assumption, as discussed previously. With respect to the Director's Call, the DAQ determined on June 5, 2009 that the potential impacts from the facility combustion source emissions will not cause exceedance of any applicable AALs in 02D .1100 beyond the facility property boundary and the agency concluded that no further information was required to demonstrate compliance with 02D .1100. In addition, since 2009, there have been no additional combustion sources added to the facility, and many of those combustion sources included in that analysis were permanently shutdown and removed from the site shortly after, and for the combustion sources that remain in use, there have been no changes to the type of fuel burned or combustor's heat input rate.

Cadmium

Cadmium emissions are emitted from the combustion sources only (two "gas-fired" boilers, one natural gas-fired process heater, and one natural gas-fired flare). They were analyzed as discussed above at the time of the Director's Call. It appears that the DAQ had chosen arsenic as an "example" toxic to model for combustion sources at the facility because the TPER for arsenic is lower than other pollutants including metal HAPs. For example, 0.194 lb/yr (arsenic) vs. 0.507 lb/yr (cadmium) and emission factor for arsenic is higher than cadmium and other metal HAPs. Additionally, nearly all the emissions of cadmium (12.49 lb/yr) come from the unrealistic assumption of fuel oil usage for all 8760 hours of operation instead of the time period for natural gas curtailment period only. With respect to the Director's Call, the DAQ determined on June 5, 2009 that the potential impacts from the facility combustion source emissions will not cause exceedance of any applicable AALs in 02D .1100 beyond the facility property boundary and the agency concluded that no further information was required to demonstrate compliance with 02D .1100. Moreover, since 2009, there have been no additional combustion sources added to the facility, and many of those combustion sources included in that analysis were permanently shutdown and removed from the site shortly after, and for the combustion sources that remain in use, there have been no changes to the type of fuel burned or combustor's heat input rate.

Nickel

Nickel emissions are to be emitted from the combustion sources only (two "gas-fired" boilers, one natural gas-fired process heater, and one natural gas-fired flare). The facility analyzed the combustion sources emissions pursuant to the "Director's Call" provision in 02Q .0712 in 2009, as discussed previously. It appears that the DAQ chose arsenic as an "example" toxic pollutant for all other air toxics from combustion sources to model, because the TPER for arsenic is lower than other air toxic pollutants including metal HAPs. For example, 0.194 lb/yr (equivalent to 0.00053 lb/day for arsenic) vs. 0.025 lb/day (nickel) and the emission factor is higher for arsenic than nickel and other metal HAPs. Additionally, nearly all the emissions of nickel (0.0347 lb/day) are associated with the fuel oil burning for 8760 hours annually, which is not a realistic assumption, as discussed previously. With respect to the Director's Call, the DAQ determined on June 5, 2009 that the potential impacts from the facility combustion source emissions will not cause exceedance of any applicable AALs in 02D .1100 beyond the facility property boundary and the agency concluded that no further information was required to demonstrate compliance with 02D .1100. In addition, since 2009, there have been no additional combustion sources added to the facility, and many of those combustion sources included in that analysis were permanently shutdown and removed from the site shortly after, and for the combustion sources that remain in use, there have been no changes to the type of fuel burned or combustor's heat input rate.

Benzene

The facility wide benzene emissions of 84.82 lbs/yr exceed the applicable TPER of 11.069 lb/yr. Most of the benzene emissions are from the from the two "gas-fired boilers" (NESHAP-exempt sources). Remaining emissions are from the NESHAP-subject sources (engines and fire pumps subject to 4Z, and CMPU and flare subject to 6V) and a non-NESHAP subject source (process heater).

The facility combustion sources emissions, especially for the 6J NESHAP-exempt boilers are based on an unrealistic assumption that the boilers will operate on fuel oil for all 8760 hours, considering that that they are allowed to burn fuel oil only during the natural gas curtailment period and not during the normal operations. The Permittee contends that this unrealistic emissions from fuel oil are resulting in the facility-wide emissions exceeding the associated TPER for benzene. If emissions are considered only from fuels that are permitted (i.e., natural gas only) for 8760 hours annually, the facility-wide emissions of benzene would be only 11.563 lb/yr, which is only 4% over the TPER of 11.069 lb/yr. The Permittee finally argues that these combustion emissions (from NG) at maximum rates of operation have not and will not be realized due to the lack of steam demand.

In addition, as stated earlier, the facility analyzed the combustion sources emissions pursuant to the "Director's Call" provision in 02Q .0712 in 2009. It appears that the DAQ chose arsenic as an "example" toxic pollutant for all other air toxic pollutants from combustion sources to model, because the TPER for arsenic is lower than the other TAPs. For example, 0.194 lb/yr (arsenic) vs. 11.069 lb/yr (benzene) and emission factor is higher for arsenic than benzene or other TAPs. With respect to the Director's Call, the DAQ determined on June 5, 2009 that the potential impacts from the facility combustion source emissions will not cause exceedance of any applicable AALs in 02D .1100 beyond the facility property boundary and the agency concluded that no further information was required to demonstrate compliance with 02D .1100. In addition, since 2009, there have been no additional combustion sources added to the facility, and many of those combustion sources included in that analysis were permanently shutdown and removed from the site shortly after, and for the combustion sources that remain in use, there have been no changes to the type of fuel burned or combustor's heat input rate.

Formaldehyde

Formaldehyde is emitted from only combustion sources (two "gas-fired" boilers, one natural gas-fired process heater, one natural gas-fired flare, two NESHAP-subject diesel-fired emergency engines, and four NESHAP-subject diesel-fired fire pump engines). As discussed previously, the unrealistic emissions for combustion sources burning fuel oil results into emission rate of formaldehyde exceeding the associated TPER by 30%. If emissions are considered only for fuels that are permitted (i.e., natural gas only for boilers and diesel fuel for engines), the total facility-wide emissions of formaldehyde would be only 0.036 lb/hr, which is less than the TPER of 0.160 lb/hr (~23% of TPER). Similarly, above, using the DAQ-approved modeling for arsenic an "example" pollutant, impacts due to formaldehyde emissions from combustion sources is expected to be less than its AAL.

Considering above, the DAQ determines that the facility is not expected to present an unacceptable risk to human health for ammonia, arsenic, beryllium, cadmium, nickel, benzene, and formaldehyde. The revised permit will contain a stipulation to limit the facility wide actual emissions (i.e., emissions from non-exempt sources subject to 02Q .0700) of ammonia, arsenic, beryllium, cadmium, nickel, benzene, and formaldehyde below their respective TPERs in 02Q .0711.

8. Facility Emissions Review

Page 1 of this application review above includes the information on actual emissions for calendar years 2015 through 2020. As discussed earlier, the facility will become a synthetic minor facility for Title V purpose for all criteria pollutants and HAPs (both single and aggregate).

9. Public Notice/EPA and Affected State(s) Review

With respect to the Title V procedures for public participation, pursuant to 15A NCAC 02Q .0521, a notice of the DRAFT Title V Permit was placed on the NCDEQ website on xx with the comment period beginning on xx. The

notice provided for a 30-day comment period with an opportunity for a public hearing. Copies of the public notice were sent to the persons on the Title V mailing list and EPA on xx. Pursuant to 15A NCAC 02Q .0522, a copy of the permit application and the proposed permit (in this case, the draft permit) were provided to EPA for their 45-day review on xx. Also pursuant to 02Q .0522, a notice of the DRAFT Title V Permit was provided to each affected State at or before the time notice provided to the public under 02Q .0521 above. A copy of the final permit will also be provided to the EPA upon issuance as per 02Q .0522.

10. Stipulation Review

The following Table 10-1 lists the changes to the Stepan Company's Air Quality Permit No. 00164T55:

Table 10-1 Summary of Changes to Current Permit

Old Page Air Quality Permit No. 00164T55	**Old Section** Air Quality Permit No. 00164T55	**New Page** Air Quality Permit No. 00164T56	**New Section** Air Quality Permit No. 00164T56	**Description of Change(s)**
Cover letter, insignificant activity attachment, and first page of permit				Revised both the cover letter and the 1st page of the permit as per DAQ's Title V Shell template. Regarding the cover letter, separated out the permit-contesting requirements as an attachment, as approved by the NC AG's office. Included the NAICS code (in addition to SIC code) for the facility and a reminder for the renewal due date in the cover page. Removed the insignificant activity (IAs) list as an attachment to the cover letter per DAQ's template and relocated it to Section 2.3 on page 29 through 32. This will remove any question on whether the approved insignificant activities are part of the Title V permit. With regard to IAs, designated the activities (ID Nos. ICT-1, IH7905, IH7907, IR01, IR02, IR03, IR04, IR05, IRAW, IRESTRAN, IT12, IT1219, IT1220, IT130026R, IT19351, IT1955, IT1964, IT1991, IT5400, IT5420A-C, IT5700, IT6109R, IT6311, IT6409R, IT6417, IT64173, IT6419, IT6516A, IT6900, IT7000, IT70012, IT70013, IT70015, IT7004, IT7005, IT7006, IT7007, IT7008, IT7009, IT7011, IT7014, IT7016, IT7017, IT7019, IT7101, IT71024, IT71044, IT7104A-B, IT7200, IT7230-10, and ICRMU) as 6V NESHAP-subject.
2	Table of Contents	2	Table of Contents	Included acronyms, listing of IAs, and permit shield for non-applicable requirements.
49	List of Acronyms	3	List of Acronyms	Relocated and revised per DAQ's template.
3	Section 1 Table	4	Section 1 Table	Revised the descriptor for "Polyester Polyols Production Collection Header (VS7100 – MACT FFFF Process Vent)" to state "Polyester Polyols Production (175,000 Metric Tonnes Per Year Maximum Possible Production Rate) Collection Header". Revised the flare G-1955 heat input capacity from 36 million Btu per hour to 20 million Btu per hour. Replaced the designation of NESHAP 4F with NESHAP

Old Page Air Quality Permit No. 00164T55	**Old Section** Air Quality Permit No. 00164T55	**New Page** Air Quality Permit No. 00164T56	**New Section** Air Quality Permit No. 00164T56	**Description of Change(s)**
				6V for affected sources (ID Nos. R-7100A, A-7100-2A, T-7100-4A, R-7100B, A-7100-2B, T-7100-4B, T-7105, R-7100C, A-7100-2C, T-7100-4C, R-7100D, A-7100-02D, T-7100-4D, T-7102, T-7100-12, A-7230, T-7230-7, A-6105, T-6105-5, T-6101-6, T-6516B, T-7001, T-7002-A, T-7002-B, T-7002-C, T-7003, T-1939AR, T-1922C, T-1922D, T-1922E, T-1941, WW Truck Loading, RESEQLK, and G-1955). Removed the site remediation activities (ID No. ES-01), organic liquid unloading stations (ID No. CLRMU), and wastewater tank (ID No. T-6109R), and relocated them to Section 2.3 IAs list. Emissions of tank T-6109R were only 1.55 lbs per year with the storage of non-HAP non-VOC material for this repurposed tank.
6	Section 2.1 C Table	7	Section 2.1 C Table	Included a new applicable requirement in 02Q .0315 for pollutants CO, NOx, SO_2, VOC, and HAPs (both single and aggregate). For the existing applicable requirement in 02Q .0317, included pollutant VOC. Included a new requirement in 02Q .0711.
8	Section 2.1 D Table	9	Section 2.1 D Table	Included a new applicable requirement in 02Q .0315 for pollutants CO, NOx, SO_2, VOC, and HAPs (both single and aggregate). For the existing applicable requirement in 02Q .0317, included pollutant VOC.
13	Section 2.1 E Table	14	Section 2.1 E Table	Included a new applicable requirement in 02Q .0315 for pollutants CO, NOx, SO2, VOC, and HAPs (both single and aggregate). For the existing applicable requirement in 02Q .0317, included pollutant VOC. Included a new requirement in 02Q .0711.
15	Section 2.1 F Table	15	Section 2.1 F Table	Included a new applicable requirement in 02Q .0315 for pollutants CO, NOx, SO2, VOC, and HAPs (both single and aggregate). For the existing applicable requirement in 02Q .0317, included pollutant VOC.
16-17	Section 2.1 G	16	Section 2.1 G	Removed all requirements for the site remediation activities with this reclassification to an area source, and designated the section as "reserved". Relocated the source to Section 2.3 IAs list.
17-18	Section 2.1 H	16	Section 2.1 H	Removed all requirements for the liquid unloading stations with this reclassification to an area source, and designated the section as "reserved". Relocated the source to Section 2.3 IAs list.
18	Section 2.1 I	16	Section 2.1 I	Included the descriptor to match the designated 6V sources in Section 1 Table.
18	Section 2.1 I Table	17	Section 2.1 I Table	Included a new applicable requirement in 02Q .0315 for pollutants CO, NOx, SO2, VOC, and HAPs (both single and aggregate). For the existing applicable requirement in 02Q .0317, included pollutant VOC.

Old Page Air Quality Permit No. 00164T55	Old Section Air Quality Permit No. 00164T55	New Page Air Quality Permit No. 00164T56	New Section Air Quality Permit No. 00164T56	Description of Change(s)
19 through 22	Section 2.1 I.2 through 6	18 through 25	Section 2.1 I.2	Replaced the 4F NESHAP requirements with 6V NESHAP.
22 through 33	Section 2.2 A	-	-	Removed these non-applicable requirements.
33 through 37	Section 2.2 B	-	-	Removed these non-applicable requirements.
37	Section 2.2 C Table	26	Section 2.2 A Table	Renumbered it to Section 2.2 A. In the Table, included a new applicable requirement in 02Q .0315 for pollutants CO, NOx, SO2, VOC, and HAPs (both single and aggregate). For the existing applicable requirement in 02Q .0317, included pollutant VOC. Included a new requirement in 02Q .0711.
-	-	26-27	Section 2.2 A.2	Included a new requirement in 02Q .0315.
38	Section 2.2 C.2	27-28	Section 2.2 A.3	Revised the requirements in 02Q .0317.
-	-	28-29	Section 2.2 A.4	Included a new requirement in 02Q .0711.
-	-	33	Section 2.4	Included a new section for permit shield for the non-applicable requirement in 02D .0614.
38 through 46	Section 3	34 though 42	Section 3	Revised the General Conditions as per DAQ's Title V Shell.

11. Conclusions, Comments, and Recommendations

- The application does not involve any new or modified air pollution control device on a new or modified source at the facility, requiring review of a design or determination of its performance by a professional engineer licensed in NC. Thus, the requirement in 02Q .0112 "Applications Requiring Professional Engineer Seal" does not apply.

- The submitted application does not entail expansion of the existing facility. Thus, the zoning consistency requirement in 02Q .0507(d)(1) may not apply. Regardless the applicant requested to New Hanover County and the County issued a zoning determination on October 5, 2020 stating that "the proposed operation is consistent with and applicable zoning and subdivision ordinances".

- The pre-public notice draft permit was emailed to the Permittee for review on February 2, 2022. Ms. Charity Coury of Stepan Company emailed the comments on the draft permit documents on February 8, 2022, which are discussed below along with the DAQ response to each. Moreover, DAQ discussed the comments and DAQ responses with Ms. Coury on February 10, 2022.

  <u>Permit</u>

  Comment 1:

  In Section 1 Table for flare G-1955, revise the heat input capacity of flare from 36 million Btu per hour to 20 million Btu per hour.

  Response:

The flare (G-1955) natural gas usage of 20 million Btu per hour corresponds to its maximum heat input rate at the maximum design flow. The reason the permit lists it currently as 36 million Btu per hour is that the flare design is based on maximum flow. The heat rating (corresponding to the maximum design flow) in the past when Stepan used the anaerobic wastewater treatment plant to burn methane was 36 million Btu per hour. The facility does not have any availability of methane for burning in flare (as anaerobic wastewater treatment plant has been decommissioned). The facility has specified that the flare would not operate at all if the process VOC gas is not available for flaring. Facility has argued that the current total gas (natural gas + VOC from process) for flaring contains much less heat input than methane. Heating value of methane is ~1010 Btu/scf and currently the set point is 300 Btu/scf (mixture of NG and process flow) to maintain the compliance with the 200 Btu/scf limit (flare performance requirement under 6V NESHAP). It is also noted that this 20 million Btu per hour heat input capacity is utilized for flare for demonstrating compliance with the synthetic minor limits for both Title V and PSD purposes. In sum, the DAQ will revise the flare heat input capacity from 36 million Btu per hour to 20 million Btu per hour.

Comment 2:

Remove vapor balance T-6109R control for source WW Truck Loading, keeping only the flare G-1955 as the only viable control for this source.

Response:

This change will be made. The DAQ agrees with the Permittee that the emission control with the operation of vapor balance loop will not have much impact in achieving compliance with the synthetic minor limits for both the Title V and PSD purposes, and it is the other control equipment of flare, which will allow the Permittee to demonstrate compliance with these limits. In sum, DAQ will remove the vapor balance loop as a control device for the source of WW Truck Loading (truck loading).

Comment 3:

Regarding Section 2.1 I.2, tanks T-6516B, T-7003, T-7001, T-7002-A, T-7002-B, and T-7002-C are storage tanks, and not process water tanks, and they need to be described accordingly.

Response:

Agreed. This change will be made.

Comment 4:

The Permittee questions whether the permit condition in Section 2.1 I.2. h should state that the Permittee is assuming the TRE of ≤ 1 instead of any testing for TRE determination to comply with the Table 3 requirements accordingly.

Response:

As stated previously, if the TRE index value for a continuous process vent is less than or equal to 1.0, the Permittee must also comply with the emission limits and other requirements in Table 3 to this Subpart (in addition to §63.11496(b)(1) through (3)). Since the Permittee is controlling organic HAP emissions per Table 3 to the Subpart (by routing closed vent emissions to a flare), determination of TRE is not required, consistent with pursuant to §63.11496(b)(1)(i). In sum, no change to the permit language is necessary.

Comment 5:

In Section 2.1 I.2. u, state that the flare initial compliance assessment is only required if the Stepan-submitted waiver request is not granted by DAQ.

Response:

As stated, according to §§63.997(b)(2) and 63.999(a)(1)(iii), the Permittee has submitted to DAQ on February 2, 2022 a waiver request for performance of the required initial flare compliance assessment in §63.987(b)(1). The request includes justification for such waiver including technical infeasibility or the impracticality of the flare compliance assessment. If approved by the DAQ, the Permittee is not required to conduct initial flare compliance assessment.

The DAQ believes that the referenced permit condition explicitly includes the qualifier for such waiver submittal request and approval by citing the requirements in §63.997(b). DAQ believes that this permit term is clear; thus, there is no need to further clarify.

Comment 6:

For Section 2.1 I.2.y.i.(B), the Permittee questions, "can we add back in the rolling 3-hour BTU/scf recordkeeping and reporting requirement? That makes it straightforward for us in the event we have a BTU issue- we know how to report it. The way SS is written, there is no descriptive BTU monitoring."

Response:

The DAQ has previously (current permit under MACT FFFF) provided for specific compliance method using rolling average of three one-hour block averages with regard to heat content determinations. The DAQ will continue with the same approach under 6V requirements as well and accordingly modify the Section 2.1 I.2.y.

Comment 7:

In Sections 2.2 A.2.e.iii and 2.2 A.3.d.iii, replace the requirement to use the TANKS program with the AP-42 emissions factors (Section 7.1).

Response:

Agreed. This change will be made. For emissions estimates for both HAPs and VOC purposes, AP-42 emissions factors in Section 7.1 Organic Liquid Storage Tanks, 6/20, will be utilized for permit compliance. Thus, these permit terms will be revised to specify that the Permittee needs to use these AP-42 emissions factors for storage tanks emissions.

Comment 8:

In Section 2.2 A.3.c.iv, the Permittee states that "the total amount of each type of VOC-containing material consumed" is organics consumed by the facility and questions whether the DAQ needs to restate it.

Response:

DAQ will revise the language commented by Stepan and replace it with "the total amount of each type of raw materials consumed".

Comment 9:

The Permittee has asked the DAQ to designate the following insignificant activities as GACT VVVVVV subject: IT1991, IT5400, IT5420A-C, IT5700, and ICLRMU.

Response:

Agreed. The 6V NESHAP designation will be included for all commented insignificant activities.

Application Review

Comment 10:

In Section 2 of the application review, the Permittee requests that DAQ replace the products names of Terate 5100 polyol and Terate 5500 polyol with Terate and Stepanpol products.

Response:

Agreed. This change will be made in the application review.

Comment 11:

For Section 5 emissions estimate discussions , the Permittee states that emissions estimate for storage tanks is based on EPA emissions factors (Section 7.1) and not literature.

Response:

Agreed. As stated earlier (response to comment 7), this change will be made.

Comment 12:

With regard to emissions units subject to 6V NESHAP, tanks T-6516B, T-7003, T-7001, T-7002-A, T-7002-B, and T-7002-C are storage tanks, and not process water tanks, and they need to be described accordingly.

Response:

As stated in the response to comment 3, this change will be made.

Comment 13:

In Table 5-3, correct the polyester polyol production capacity from 60 metric tonnes to 60,000 metric tonnes. In the same table, rename the tank T-6109R from "wastewater tank" to "raw material tank". Finally in the table, revise the heat input rate of flare from 32 million Btu per hour to 20 million Btu per hour.

Response:

Agreed. All these changes will be made.

Comment 14:

In Section 5, with regard to standards for wastewater streams, specify the tanks T-1939AR and T-6101-6 as polyol process tanks and not distillation reflux tanks.

Response:

Agreed. This change will be made.

Comment 15:

For monitoring requirements under avoidance of both Title V and PSD, regarding the HAP and VOC emissions, AP-42 emissions factors in Section 7.1 Organic Liquid Storage Tanks, 6/20, will be utilized for permit compliance.

Response:

As stated above in the response to comment 7, this change will be made.

Comment 16:

In Section 6 of the application review as well as in the cover letter of the permit, Stepan requests to correct the statement on actual emissions increases in 0.12 pounds per hour of SO_2, 1.49 pounds per hour of PM10, and 9.12 pounds per hour of NOx.

Response:

Agreed. This change will be made both in the application review and permit. The above values on change in emissions for each of the pollutants are incorrect. The correct values for increases in emissions are as below: 2.26 pounds per hour of SO_2, 0.33 pounds per hour of PM_{10}, and 2.65 pounds per hour of NOx.

- The pre-public notice draft permit was emailed to the Wilmington Regional Office (WiRO) for review and comment on February 2, 2022. Ashby Armistead of WiRO emailed with one comment, regarding the reference for the use of TANKS program for storage tanks emissions monitoring, requesting it to replace with AP-42 emissions factors (Section 7.1). As stated before, this change will be made in both the permit and application review.

- The review engineer recommends issuing the revised Title V permit after the completion of both the public review (30-days) and EPA review (45-days) periods.