Commonwealth of Kentucky
Division for Air Quality

STATEMENT OF BASIS AND SUMMARY

Title V, Operating
Permit: V-24-024
ISP Chemicals LLC
455 North Main Street
Calvert City, KY 42029
October 20, 2024
Permit Review Branch

SOURCE ID:	21-157-00003
AGENCY INTEREST:	2939
ACTIVITY:	APE20230002

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SECTION 1 – SOURCE DESCRIPTION

SIC Code: 2869, Industrial Organic Chemicals, NEC (except aliphatics, carbon bisulfide, ethyl alcohol, cyclopropane, diethylcyclohexane, naphthalene sulfonic acid, synthetic hydraulic fluids, and fluorocarbon gases)

Single Source Det. ☐ Yes ☒ No If Yes, Affiliated Source AI:

Source-wide Limit ☒ Yes ☐ No If Yes, See Section 4, Table A

28 Source Category ☒ Yes ☐ No If Yes, Category: Chemical process plants, except ethanol production facilities producing ethanol by natural fermentation under NAICS codes 325193 or 312140

County: Marshall
Nonattainment Area ☒ N/A ☐ PM_{10} ☐ $PM_{2.5}$ ☐ CO ☐ NO_X ☐ SO_2 ☐ Ozone ☐ Lead

PTE* greater than 100 tpy for any criteria air pollutant ☒ Yes ☐ No
If yes, for what pollutant(s)?
☐ PM_{10} ☐ $PM_{2.5}$ ☒ CO ☒ NO_X ☐ SO_2 ☒ VOC

PTE* greater than 250 tpy for any criteria air pollutant ☒ Yes ☐ No
If yes, for what pollutant(s)?
☐ PM_{10} ☐ $PM_{2.5}$ ☐ CO ☐ NO_X ☐ SO_2 ☒ VOC

PTE* greater than 10 tpy for any single hazardous air pollutant (HAP) ☒ Yes ☐ No

If yes, list which pollutant(s): Acetaldehyde, Benzene, Methanol, Styrene, Toluene

PTE* greater than 25 tpy for combined HAP ☒ Yes ☐ No

*PTE does not include self-imposed emission limitations.

Description of Facility:
ISP is a large Synthetic Organic Chemical plant that makes a wide variety of intermediates and specialty chemicals.

SECTION 2 – CURRENT APPLICATION

Permit Number: V-24-024 Activities: APE20230002

Received: 5/18/2023 Application Complete Date(s): 9/24/2024

Permit Action: ☐ Initial ☒ Renewal ☐ Significant Rev ☐ Minor Rev ☐ Administrative

Construction/Modification Requested? ☒Yes ☐No

Previous 502(b)(10) or Off-Permit Changes incorporated with this permit action ☒Yes ☐No

Description of Action:

502(b)(10) Change
APE20220002:
On August 30, 2022, ISP Chemicals submitted a 502(b)(10) Change notification for the construction of a new building and process unit. This new building will be designated the 243 Building. The polymer production batch process contained therein will consist of a 1,980 liter reactor and associated feed, mix, and product storage. This process takes an existing base polymer and reacts it to create longer polymer chains. The solids handling system helps control the dry material being added to the reactor and consists of 3 hoppers, two dust collectors and a local area ventilation system. The final product is packaged from either the mix tank or the product storage tanks into drums, totes and tank truck. The increase in emissions of VOC is shown to be less than the significant emission rate to trigger further review under 401 KAR 51:017. An addendum to this notification was received May 17, 2024, identifying HAP impurities present at ppm levels in certain raw materials and therefor the process will be considered a MCPU and subject to 40 CFR 63, Subpart FFFF, though there are no requirements.

Renewal
APE20230002:
On May 18, 2023, ISP Chemicals submitted a Title V Renewal Application for their current V-18-036 R2 permit, set to expire November 18, 2023. As part of their permit renewal application, ISP Chemicals requested the following changes:

- Addition of non-applicable regulations to the permit that had been cited in the Statement of Basis only.
- Remove the Venturi Scrubber controlling the Steam Spray Dryer 200/3641 under the 002 emission unit in the 200 Building from the permit and revert back to the Baghouse as construction did not occur.
- Remove the LVP 325 Acetylene compression and Feed System (Emission Unit LVP in the Vinyl Pyrrolidones Unit) from the permit as the change did not occur.
- Request to remove both the 401 KAR 59:005 and 59:010 conditions from permit for the RD emission unit of the R&D Pilot Plant.
- Acrylonitrile, dimethyl formamide, formaldehyde, and xylene were removed from DEP7007N form. These deletions were included in the air toxics modeling provided to KDAQ in May 2018 during the review process for renewal permit V-18-036 so the emissions have already been reviewed by KDAQ and no permit changes are required.

- Reduce the throughput for north cooling tower cells from 5,700 gpm to 4,250 gpm. The north cooling towers were replaced with new smaller units in 2012. South cooling tower cells were replaced with new smaller units of identical capacity as the former south towers in 2017.
- Various typological errors were corrected.
- Update to the requirements from 40 CFR 63, Subpart FFFF as finalized in 85 FR 49132 August 12, 2020, and 40 CFR 63, Subpart GGGGG as finalized in 87 FR 78558, December 22, 2022.
- Permit shield requested for non-applicable regulations in the 1996 initial Title V applications.

Off-Permit Change
APE20230003:
On June 16, 2023, ISP Chemicals submitted an off-permit change for a trial to determine in existing solvent recovery unit SR1 is capable of purifying a crude tetrahydrofuran stream produced at another ISP facility. This is a trial from which the results will be used to evaluate the future large-scale processing. The facility showed that the increase in emissions from week of trial will increase VOC emissions by 0.0387 tpy and methanol by 6.94E-6 tpy.

502(b)(10) Change
APE20240002:
On September 12, 2024, ISP Chemicals submitted a 502(b)(10) Change notification for producing an additional family of materials (Easy Wet Liquid) using existing equipment in 315 Building. the construction of a new building and process unit. This product is an oligomeric alkyl polyether polyol used a liquid wetting agent. Polyethylene glycol and 2-ethylhexyl glycidyl ether are charged from totes to reactor 315/3303 and after the reaction is complete, the product is sent to process tank 315/3308 from where it will be packaged into drums or totes. Though four grades of Easy Wet can be produced, the PTE is calculated based on worst case for each pollutant emitted during producing of one of those grades. Though the MCPU is subject to 40 CFR 63, Subpart FFFF, there are no new requirements except the General Requirements and Ethylene Oxide determination requirements both identified under Group requirements in the permit. The facility has shown that the increase in emissions from the making of this product does not exceed the significant emissions rate for VOC emissions and so does not trigger further review under 401 KAR 51:017.

V-24-024 Emission Summary			
Pollutant	2023 Actual (tpy)	PTE V-18-036 R2 (tpy)	PTE V-24-024 (tpy)
PM/PM_{10}	18.95	38.15	37.22
$PM_{2.5}$	16.33	35.86	37.22
SO_2	0.44	1.61	1.61
NO_x	74.13	176.7	176.7
CO	46.18	134.5	134.5
VOC	427.35	940.72	
Hazardous Air Pollutants (HAPS)			
1,2 - Dibromoethane	--	--	6.12
1,4-Dioxane	--	--	3.7E-4
Acetaldehyde	10.35	26.8	28.99
Acrylic Acid	0.19	0.27	031
Benzene	7.76	13.53	13.53
Caprolactam	0.18		0.23
Carbon Disulfide	0.96	0.95	0.96
Diethanolamine	0.18	0.23	0.23
Diethyl Sulfate	1.79	3.01	3.41
Epichlorohydrin	--	--	1.7E-4
Ethylene Glycol	--	--	2.97E-5
Ethylene Oxide	--	--	0.277
Formaldehyde	0.21	0.07	0.14
Glycol Ethers	0.18	0.73	0.73
Hexane	0.18	0.23	0.23
Hydrochloric Acid	0.18	0.23	0.23
Maleic Anhydride	0.60	2.47	2.47
Methanol	9.16	14.49	14.49
Methyl Methacrylate			0.23
Naphthalene	0.19	0.19	0.19
Styrene	8.57	10.58	10.58
Toluene	9.03	14.35	14.35
Triethyl Amine	0.18	0.23	0.23
Vinyl Acetate	0.83	2.81	2.80
Xylene	0.18	0.23	--
Source wide HAPs or Combined HAPs	57.63	91.64	100.52
Greenhouse Gases (GHGs)			
Nitrous Oxide	1.65	4.40	4.4
Carbon dioxide (CO_2)	90,232	240,268	240,268
Methane	1.73	4.60	4.6
CO_2 Equivalent	---	241,694	241694

Section 3 – Emissions, Limitations and Basis

Gamma-Butyrolactone (BLO) Process Unit:
EU#BL1: BLO Process Vents, and EU#BL02: BLO Fugitive Emissions

Initial Construction and Modification Dates: 1960, modifications in 1964, 1965, and 1981

Process Description:
Gamma-butyrolactone (BLO) is produced by vapor phase dehydrogenation of butanediol (B1D) in a fixed-bed catalytic reactor. Crude BLO is distilled, purified, cooled, and stored. Liquid residues are removed and shipped off-site for Btu recovery. By-product hydrogen is vented to boilers and process heaters for Btu recovery, or vented to the atmosphere. Wastewater is sent to the on-site wastewater treatment plant.

The Unit includes the following equipment:
211/3411 – Ammonia column (common with pyrrolidones unit)
211/3415 – Residue tower (common with pyrrolidones unit)
224/3302 – Reactor
224/3401 – Lights tower (common with pyrrolidones unit)
224/3402 – Final tower (common with pyrrolidones unit)
225/3301 – Reactor
225/3401 – Lights tower (common with pyrrolidones unit)
225/3402 – Final tower (common with pyrrolidones unit)

Applicable Regulation:
401 KAR 50:012, General application

401 KAR 63:002, Section 2(4)(a), 40 C.F.R. 63.100 through 63.107, Tables 1 through 4 (Subpart F), National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry.

Non-applicable Regulation:
401 KAR 60:005, Section 2(2)(bbb), 40 C.F.R. 60.480 through 60.489 (Subpart VV), Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After January 5, 1981, and on or Before November 7, 2006. This regulation does not apply because the equipment used in the chemical manufacturing process does not meet the definition of a process unit, pursuant to 40 CFR 60.480(f): components assembled to produce, as intermediate or final products, one or more of the chemicals listed in 40 CFR 60.489.

401 KAR 60:005, Section 2(2)(ppp), 40 C.F.R. 60.660 through 60.668 (Subpart NNN), Standards of Performance for Volatile Organic Compound (VOC) Emissions From Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations. This regulation does not apply because the distillation units at the source are not an affected facility since the process unit(s) do not produce any of the chemicals listed in 40 CFR 60.667 as a product, co-product, by-product, or intermediate.

401 KAR 60:005, Section 2(2)(ttt), 40 C.F.R. 60.700 through 60.708 (Subpart RRR), Standards of Performance for Volatile Organic Compound Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes. This regulation does not apply because the reactors at the source are not an affected facility since the process unit(s) do not produce any of the chemicals listed in 40 CFR 60.707 as a product, co-product, by-product, or intermediate.

Gamma-Butyrolactone (BLO) Process Unit:
EU#BL1: BLO Process Vents, and EU#BL02: BLO Fugitive Emissions

401 KAR 63:002, Section 2(4)(b), 40 C.F.R. 63.110 through 63.153, Tables 1 through 37, and Figure 1 (Subpart G), National Emission Standards for Organic Hazardous Air Pollutants From the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(2): the unit(s) do not use as a reactant or manufacture as a product, or co-product, one or more of the organic hazardous air pollutants listed in Table 2 of 40 CFR 63, Subpart F.

401 KAR 63:002, Section 2(4)(c), 40 C.F.R. 63.160 through 63.183, Tables 1 through 4 (Subpart H), National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(2): the unit(s) do not use as a reactant or manufacture as a product, or co-product, one or more of the organic hazardous air pollutants listed in Table 2 of 40 CFR 63, Subpart F.

401 KAR 63:002, Section 2(4)(lll), 40 C.F.R. 63.2430 through 63.2550, Tables 1 through 12 (Subpart FFFF), National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing. Pursuant to 40 CFR 63.2435(b), this regulation does not apply because the MCPU does not satisfy the condition specified in 40 CFR 63.2435(b)(2): the MCPU does not process, use, or generate any of the organic HAP listed in section 112(b) of the CAA or hydrogen halide and halogen HAP, as defined in 40 CFR 63.2550.

Comments:
Emission factors for the Gamma-Butyrolactone (BLO) Process Unit were established using EPA's guidance on quantifying Potential to Emit (PTE) of batch chemical processing units. This guidance is described in an EPA memo dated August 29, 1996, which also contains the EPA approved methodology suggested by the Synthetic Organic Chemical Manufacturers Association (SOCMA).

401 KAR 50:012 – RAP Requirements:

Emission Unit Type	VOC RAP Control Procedure
Process Vents	Majority of process emissions are vented to three site boilers
Fugitive Equipment Leaks	None-Instrumental monitoring is not reasonable for heavy liquid components
Storage Tanks	Fixed roofs-vapor pressure significantly lower than NSPS storage tank exemption thresholds

Pyrrolidones Unit:
EU#PY1: Pyrrolidones Unit Process Vents, and EU#PY2: Pyrrolidones Unit Fugitive Emissions

Initial Construction and Modification Dates:

1955, modifications in 1957, 1960, 1964, 1965, 1975, 1981, 1992, and 2008.

Process Description:

2-Pyrrolidone is produced by the reaction of anhydrous ammonia and Butyrolactone (BLO). The crude product is sent to a distillation unit. BLO area columns are also tied to the Pyrrolidones unit. Excess ammonia and water are separated and partially recycled back to the process, and the remainder is sent to a steam/air ammonia stripper. The overhead ammonia is vented to the atmosphere. The stripper bottoms are sent to the sewer. BLO is also reacted with an alkylamine to form a substituted pyrrolidone. Crude product is cooled and distilled in Area 315, or Area 211, or sent to a toll processor.

The Unit includes the following equipment:
211/3303 – Reactor
211/3305 – Reactor
211/3411 – Ammonia column (common with BLO unit)
211/3415 – Residue tower (common with BLO unit)
211 – Tank wagon loading
222/3002 – Process tank (2,300 gal capacity)
222/3302 – Reactor
222/3401 – Ammonia Tower
222/3402 – Residue Tower
222/3404 – Ammonia Stripper
224/3401 – Lights tower (common with BLO unit)
224/3402 – Final tower (common with BLO unit)
225/3401 – Lights tower (common with BLO unit)
225/3402 – Final tower (common with BLO unit)
315/3304 – Polymerizer (common with 315 building)
315/3307 – Reactor (common with 315 building)

Applicable Regulation:
401 KAR 50:012, General application.

Non-applicable Regulation:
401 KAR 60:005, Section 2(2)(bbb), 40 C.F.R. 60.480 through 60.489 (Subpart VV), Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After January 5, 1981, and on or Before November 7, 2006. This regulation does not apply because the equipment used in the chemical manufacturing process does not meet the definition of a process unit, pursuant to 40 CFR 60.480(f): components assembled to produce, as intermediate or final products, one or more of the chemicals listed in 40 CFR 60.489.

Pyrrolidones Unit:
EU#PY1: Pyrrolidones Unit Process Vents, and EU#PY2: Pyrrolidones Unit Fugitive Emissions

401 KAR 60:005, Section 2(2)(ppp), 40 C.F.R. 60.660 through 60.668 (Subpart NNN), Standards of Performance for Volatile Organic Compound (VOC) Emissions From Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations. This regulation does not apply because the distillation units at the source are not an affected facility since the process unit(s) do not produce any of the chemicals listed in 40 CFR 60.667 as a product, co-product, by-product, or intermediate.

401 KAR 60:005, Section 2(2)(ttt), 40 C.F.R. 60.700 through 60.708 (Subpart RRR), Standards of Performance for Volatile Organic Compound Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes. This regulation does not apply because the reactors at the source are not an affected facility since the process unit(s) do not produce any of the chemicals listed in 40 CFR 60.707 as a product, co-product, by-product, or intermediate.

401 KAR 63:002, Section 2(4)(a), 40 C.F.R. 63.100 through 63.107, Tables 1 through 4 (Subpart F), National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(1): the unit(s) do not manufacture as a primary product a chemical listed in Table 1 of 40 CFR 63 Subpart F, tetrahydrobenzaldehyde, or crotonaldehyde.

401 KAR 63:002, Section 2(4)(b), 40 C.F.R. 63.110 through 63.153, Tables 1 through 37, and Figure 1 (Subpart G), National Emission Standards for Organic Hazardous Air Pollutants From the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(1): the unit(s) do not manufacture as a primary product a chemical listed in Table 1 of 40 CFR 63 Subpart F, tetrahydrobenzaldehyde, or crotonaldehyde.

401 KAR 63:002, Section 2(4)(c), 40 C.F.R. 63.160 through 63.183, Tables 1 through 4 (Subpart H), National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(1): the unit(s) do not manufacture as a primary product a chemical listed in Table 1 of 40 CFR 63 Subpart F, tetrahydrobenzaldehyde, or crotonaldehyde.

401 KAR 63:002, Section 2(4)(lll), 40 C.F.R. 63.2430 through 63.2550, Tables 1 through 12 (Subpart FFFF), National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing. Pursuant to 40 CFR 63.2435(b), this regulation does not apply because the MCPU does not satisfy the condition specified in 40 CFR 63.2435(b)(2): the MCPU does not process, use, or generate any of the organic HAP listed in section 112(b) of the CAA or hydrogen halide and halogen HAP, as defined in 40 CFR 63.2550.

Comments:
Emission factors for the Pyrrolidones Unit were established using EPA's guidance on quantifying Potential to Emit (PTE) of batch chemical processing units. This guidance is described in an EPA memo dated August 29, 1996, which also contains the EPA approved methodology suggested by the Synthetic Organic Chemical Manufacturers Association (SOCMA).

Pyrrolidones Unit:
EU#PY1: Pyrrolidones Unit Process Vents, and EU#PY2: Pyrrolidones Unit Fugitive Emissions

401 KAR 50:012 – RAP Requirements:

Emission Unit Type	VOC RAP Control Procedure
Process Vents	None-Each emission unit emits VOC at less than insignificant activity levels, RAP not reasonable for non-HAP insignificant activities
Fugitive Equipment Leaks	None-Instrumental monitoring is not reasonable for heavy liquid components
Storage Tanks	Fixed roofs-vapor pressure significantly lower than NSPS storage tank exemption thresholds

Vinyl Pyrrolidones Unit:
EU#VP1: Vinyl Pyrrolidones Unit Process Vents, and
EU#VP2: Vinyl Pyrrolidones Unit Fugitive Emissions

Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
Opacity	20% for more than 3 minutes /day	401 KAR 63:015, Section 3	NA	Compliance with 40 CFR 60.18(c)(3)-(6)
VOC	Less than 36 tpy (for VP1(02), VP1(03), 261(02) and 261(03) - acetylene feed systems, combined)	To preclude 401 KAR 51:017	1,000 lbs VOC per 1,000 lbs flared (98% destruction) or per 1,000 lbs vented - see comments below for EF basis	Calculate total VOC emissions on a 12-month rolling basis and maintain records

Initial Construction and Modification Dates: 1956, modifications in 1960, 1962, 1965, 1973, and 1994.

Process Description:
Vinyl Pyrrolidone (VP) is produced by reacting 2-pyrrolidone with acetylene. Potassium hydroxide is used as a catalyst. Propane is used as an inert diluent. The crude VP is purified by distillation, and unreacted 2-pyrrolidone is recycled to the reactor. Some VP is stabilized and stored in tanks. The balance of the VP is used to make other products downstream of this process.

The Unit includes the following equipment:
223/3401 – Lights tower
223/3402 – Recovered pyrrolidone tower
223/3403 – Product tower
223/3501 – Stripper
237/3211 – High purification tower
326/3304 – Prep kettle
326/3305 – C vinylator
326/3306 – D vinylator
----------Acetylene Feed system

Applicable Regulation:
401 KAR 63:015, Flares.

Vinyl Pyrrolidones Unit:
EU#VP1: Vinyl Pyrrolidones Unit Process Vents, and
EU#VP2: Vinyl Pyrrolidones Unit Fugitive Emissions

401 KAR 63:002, Section 2(4)(a) 40 C.F.R. 63.100 through 63.107, Tables 1 through 4 (Subpart F), National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry.

Non-applicable Regulation:
401 KAR 50:012, General application

401 KAR 60:005, Section 2(2)(bbb), 40 C.F.R. 60.480 through 60.489 (Subpart VV), Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After January 5, 1981, and on or Before November 7, 2006. This regulation does not apply because the equipment used in the chemical manufacturing process does not meet the definition of a process unit, pursuant to 40 CFR 60.480(f): components assembled to produce, as intermediate or final products, one or more of the chemicals listed in 40 CFR 60.489.

401 KAR 60:005, Section 2(2)(ppp), 40 C.F.R. 60.660 through 60.668 (Subpart NNN), Standards of Performance for Volatile Organic Compound (VOC) Emissions From Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations. This regulation does not apply because the distillation units at the source are not an affected facility since the process unit(s) do not produce any of the chemicals listed in 40 CFR 60.667 as a product, co-product, by-product, or intermediate.

401 KAR 60:005, Section 2(2)(ttt), 40 C.F.R. 60.700 through 60.708 (Subpart RRR), Standards of Performance for Volatile Organic Compound Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes. This regulation does not apply because the reactors at the source are not an affected facility since the process unit(s) do not produce any of the chemicals listed in 40 CFR 60.707 as a product, co-product, by-product, or intermediate.

401 KAR 63:002, Section 2(4)(b), 40 C.F.R. 63.110 through 63.153, Tables 1 through 37, and Figure 1 (Subpart G), National Emission Standards for Organic Hazardous Air Pollutants From the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater. Pursuant to 40 CFR 63.100(b), this regulation does not apply as the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(2): the unit(s) do not use as a reactant or manufacture as a product, or co-product, one of the organic hazardous air pollutants listed in 40 CFR 63, Subpart F, Table 2.

401 KAR 63:002, Section 2(4)(c), 40 C.F.R. 63.160 through 63.183, Tables 1 through 4 (Subpart H), National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(2): the unit(s) do not use as a reactant or manufacture as a product, or co-product, one or more of the organic hazardous air pollutants listed in Table 2 of 40 CFR 63, Subpart F.

401 KAR 63:002, Section 2(4)(lll), 40 C.F.R. 63.2430 through 63.2550, Tables 1 through 12 (Subpart FFFF), National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing.

Vinyl Pyrrolidones Unit:
EU#VP1: Vinyl Pyrrolidones Unit Process Vents, and
EU#VP2: Vinyl Pyrrolidones Unit Fugitive Emissions

Pursuant to 40 CFR 63.2435(b), this regulation does not apply because the MCPU does not satisfiy the condition specified in 40 CFR 63.2435(b)(2): the MCPU does not process, use, or generate any of the organic HAP listed in section 112(b) of the CAA or hydrogen halide and halogen HAP, as defined in 40 CFR 63.2550.

Precluded Regulations:
401 KAR 51:017, Prevention of significant deterioration of air quality.

Comments:
Emission factors for the Vinyl Pyrrolidones Unit were established using EPA's guidance on quantifying Potential to Emit (PTE) of batch chemical processing units. This guidance is described in an EPA memo dated August 29, 1996, which also contains the EPA approved methodology suggested by the Synthetic Organic Chemical Manufacturers Association (SOCMA).

The synthetic minor limit for total VOC emissions from VP1(02), VP1(03), 261(02) and 261(03) of 36 tons per year was established under permit V-06-052 R2.

APE20190004: Additional VOC emissions monitoring added under **Section D** for source obligation requirements associated with the addition of LVP (new acetylene feed system).

APE20230002: Construction of the LVP was authorized in a minor permit revision permitted via V-18-036 R2 issued January 3, 2021. Construction did not commence within 18 months of January 03, 2021. Therefore, construction/operation authority has expired and has been removed from the renewal permit V-24-024.

Solvent Recovery Unit (SRU):
EU#SR1: SRU Process Vents, and EU#SR2: SRU Fugitive Emissions

Modification Date: 1989

Process Description:
The distillates for the Gantrez ES-225 and ES-425 processes are separated into acetone and ethanol. High quality ethanol is re-used in the Gantrez process. Recovered acetone and by-product ethanol are either resold or shipped off-site as waste.
The Unit includes the following equipment:
231/3402 – Distillation column; 231/3403 – Distillation column

Applicable Regulation:
401 KAR 63:002, Section 2(4)(a), 40 C.F.R. 63.100 through 63.107, Tables 1 through 4 (Subpart F), National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry.

Non-applicable Regulation:
401 KAR 60:005, Section 2(2)(bbb), 40 C.F.R. 60.480 through 60.489 (Subpart VV), Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After January 5, 1981, and on or Before November 7, 2006. This regulation does not apply because the equipment used in the chemical

Solvent Recovery Unit (SRU):
EU#SR1: SRU Process Vents, and EU#SR2: SRU Fugitive Emissions

manufacturing process does not meet the definition of a process unit, pursuant to 40 CFR 60.480(f): components assembled to produce, as intermediate or final products, one or more of the chemicals listed in 40 CFR 60.489. A determination of non-applicability is contained in a February 10, 1996 letter from DAQ to ISP.

401 KAR 60:005, Section 2(2)(ppp), 40 C.F.R. 60.660 through 60.668 (Subpart NNN), Standards of Performance for Volatile Organic Compound (VOC) Emissions From Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations. This regulation does not apply because the distillation units at the source are not an affected facility since the process unit(s) do not produce any of the chemicals listed in 40 CFR 60.667 as a product, co-product, by-product, or intermediate. A determination of non-applicability is contained in a February 10, 1996 letter from DAQ to ISP.

401 KAR 63:002, Section 2(4)(a), 40 C.F.R. 63.100 through 63.107, Tables 1 through 4 (Subpart F), National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(2): the unit(s) do not use as a reactant or manufacture as a product, or co-product, one or more of the organic hazardous air pollutants listed in Table 2 of 40 CFR 63, Subpart F.

401 KAR 63:002, Section 2(4)(b), 40 C.F.R. 63.110 through 63.153, Tables 1 through 37, and Figure 1 (Subpart G), National Emission Standards for Organic Hazardous Air Pollutants From the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(2): the unit(s) do not use as a reactant or manufacture as a product, or co-product, one or more of the organic hazardous air pollutants listed in Table 2 of 40 CFR 63, Subpart F.

401 KAR 63:002, Section 2(4)(c), 40 C.F.R. 63.160 through 63.183, Tables 1 through 4 (Subpart H), National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(2): the unit(s) do not use as a reactant or manufacture as a product, or co-product, one or more of the organic hazardous air pollutants listed in Table 2 of 40 CFR 63, Subpart F.

401 KAR 63:002, Section 2(4)(lll), 40 C.F.R. 63.2430 through 63.2550, Tables 1 through 12 (Subpart FFFF), National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing. Pursuant to 40 CFR 63.2435(b), this regulation does not apply because the MCPU does not satisfy the condition specified in 40 CFR 63.2435(b)(2): the MCPU does not process, use, or generate any of the organic HAP listed in section 112(b) of the CAA or hydrogen halide and halogen HAP, as defined in 40 CFR 63.2550.

Comments:
Emission factors for the Sulfur Recovery Unit were established using EPA's guidance on quantifying Potential to Emit (PTE) of batch chemical processing units. This guidance is described in an EPA memo dated August 29, 1996, which also contains the EPA approved methodology suggested by the Synthetic Organic Chemical Manufacturers Association (SOCMA).

Vinyl Ethers Unit: EU#VE1: Vinyl Ethers Unit Process Vents, EU#VE2: Vinyl Ethers Unit Fugitive VOC Emissions, and EU#VE3: Vinyl Ethers Unit Fugitve Methanol Emissions				
Pollutant	**Emission Limit or Standard**	**Regulatory Basis for Emission Limit or Standard**	**Emission Factor Used and Basis**	**Compliance Method**
HAPs (organic)	Reduce collective uncontrolled organic HAP emissions from the sum of all Group 1 batch process vents within the process by ≥ 98 percent by weight by venting emissions from a sufficient number of the vents through one or more closed-vent systems to any combination of control devices (except a flare); or Reduce uncontrolled organic HAP emissions to an outlet concentration ≤ 20 ppmv as TOC or total organic HAP	40 CFR 63, Subpart FFFF, Table 2	0.0537 lb Acetaldehyde/ 1,000 lb product vented; 0.739 lb Methanol/ 1,000 lb product vented; 0.0176 lb Toluene/ 1,000 lb product vented (each EF is prior to control from Thermal Oxidizer) – see comments below for EF basis	Vent to closed vent system and Thermal Oxidizer
HAPs (organic)	Group 1 Storage Tanks where the maximum true vapor pressure of total HAP at the storage temperature is <76.6 kilopascals, reduce total HAP emissions by ≥95 percent by weight or to ≤20 ppmv of TOC or organic HAP and ≤20 ppmv of hydrogen halide and halogen HAP	40 CFR 63, Subpart FFFF, Table 4		
VOC	Less than 36 tpy (332/3411 Steam Stripper Tower only)	To preclude 401 KAR 51:017	See comments below for EF basis	Calculate total VOC emissions on a 12-month rolling basis and maintain records

Initial Construction and Modification Dates: 1954, modified in 1965, 1992, 1993, 2007, and 2010.

Process Description:
Acetylene is purified, mixed with methanol vapor, and fed to the reactor (vinylator). The catalytic reaction produces crude methyl vinyl ether (MVE), which is then purified, condensed, washed, and dried. ISP also operates a separate wash and dry unit to reclaim recovered MVE from ISP and other tollers. MVE is reclaimed by removing the contaminant acetaldehyde.

The Unit includes the following equipment:
332/3240 – Sludge Collection Tank (5,000 gal)
332/3302 – Reactor

Vinyl Ethers Unit:
EU#VE1: Vinyl Ethers Unit Process Vents, EU#VE2: Vinyl Ethers Unit Fugitive VOC Emissions, and EU#VE3: Vinyl Ethers Unit Fugitve Methanol Emissions

332/3401 – Flame Arrestor
332/3404 – Product Tower
332/3405 – Alcohol Column
332/3406 – Purge Gas Scrubber
332/3407 – Wash Tower
332/3408 – Dryer
332/3409 – Dryer
332/3410 – Dryer
332/3411 – Steam Stripper Tower
332/3414 – East Reclaim Dryer
332/3415 – West Reclaim Dryer
332/3413 – Reclaim Wash Tower
333/3001 – Methanol storage tank (42,800 gal)
333/3002 – Methanol vapor balance tank (42,800 gal)
333/3003 – Methanol storage tank (42,800 gal)
333/3101 – Organic liquid storage tank (32,500 gal)
333/3102 – Organic liquid storage tank (15,450 gal)
333/3103 – Organic liquid storage tank (15,450 gal)
333/3104 – Organic liquid storage tank (32,500 gal)
333/3105 – Organic liquid storage tank (32,500 gal)
333/3106 – Organic liquid storage tank (32,500 gal)
333/3107 – Organic liquid storage tank (32,500 gal)
333/3108 – Organic liquid storage tank (32,500 gal)
333/3109 – Organic liquid storage tank (32,500 gal)
332/3206 – Catalyst prep tank (1965, 2400 gal)
332/3207 – Catalyst tank (1965, 1730 gal)
332 – Methanol Purge System Tank Wagon Loading

Applicable Regulation:
401 KAR 63:002, Section 2(4)(lll), 40 C.F.R. 63.2430 through 63.2550, Tables 1 through 12 (Subpart FFFF), National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing.

Non-applicable Regulations:
401 KAR 60:005, Section 2(2)(bbb), 40 C.F.R. 60.480 through 60.489 (Subpart VV), Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After January 5, 1981, and on or Before November 7, 2006. This regulation does not apply because the equipment used in the chemical manufacturing process does not meet the definition of a process unit, pursuant to 40 CFR 60.480(f): components assembled to produce, as intermediate or final products, one or more of the chemicals listed in 40 CFR 60.489.

401 KAR 60:005, Section 2(2)(ppp), 40 C.F.R. 60.660 through 60.668 (Subpart NNN), Standards of Performance for Volatile Organic Compound (VOC) Emissions From Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations. This regulation does not apply because the

Vinyl Ethers Unit:
EU#VE1: Vinyl Ethers Unit Process Vents, EU#VE2: Vinyl Ethers Unit Fugitive VOC Emissions, and EU#VE3: Vinyl Ethers Unit Fugitve Methanol Emissions

distillation units at the source are not an affected facility since the process unit(s) do not produce any of the chemicals listed in 40 CFR 60.667 as a product, co-product, by-product, or intermediate.

401 KAR 60:005, Section 2(2)(ttt), 40 C.F.R. 60.700 through 60.708 (Subpart RRR), Standards of Performance for Volatile Organic Compound Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes. This regulation does not apply because the reactors at the source are not an affected facility since the process unit(s) do not produce any of the chemicals listed in 40 CFR 60.707 as a product, co-product, by-product, or intermediate.

401 KAR 63:002, Section 2(4)(a), 40 C.F.R. 63.100 through 63.107, Tables 1 through 4 (Subpart F), National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(1): the unit(s) do not manufacture as a primary product a chemical listed in Table 1 of 40 CFR 63 Subpart F, tetrahydrobenzaldehyde, or crotonaldehyde.

401 KAR 63:002, Section 2(4)(b), 40 C.F.R. 63.110 through 63.153, Tables 1 through 37, and Figure 1 (Subpart G), National Emission Standards for Organic Hazardous Air Pollutants From the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(1): the unit(s) do not manufacture as a primary product a chemical listed in Table 1 of 40 CFR 63 Subpart F, tetrahydrobenzaldehyde, or crotonaldehyde.

401 KAR 63:002, Section 2(4)(c), 40 C.F.R. 63.160 through 63.183, Tables 1 through 4 (Subpart H), National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(1): the unit(s) do not manufacture as a primary product a chemical listed in Table 1 of 40 CFR 63 Subpart F, tetrahydrobenzaldehyde, or crotonaldehyde.

Comments:
Emission factors for the Vinyl Ethers Unit were established using EPA's guidance on quantifying Potential to Emit (PTE) of batch chemical processing units. This guidance is described in an EPA memo dated August 29, 1996, which also contains the EPA approved methodology suggested by the Synthetic Organic Chemical Manufacturers Association (SOCMA).

No 40 CFR 63, Subpart FFFF Group 1 transfer racks or Group 1 batch process vents are part of a Vinyl Ethers unit MCPU. No heat exchange systems are subject to the monitoring requirements of 40 CFR 63.104 as referenced by 40 CFR 63.2490.

EU#WW1: Wastewater Treatment Operations

Initial Construction and Modification Dates: 1970, modified in 1975, 2006, and 2007.

Process Description:
Plant wastewater from all units is collected by a system consisting of individual drain systems, junction boxes, and sewers. Collected wastewater flows to a covered transfer tank, and then to covered equalization tanks. The equalization tanks feed wastewater to the covered activated sludge aeration tanks where VOC and HAP is abated. The treated wastewater flows through two clarifiers, the sludge is partially recycled, and the wastewater is sent to the outfall to the Tennessee River.
The Unit includes the following equipment:
-- Collection system (individual drain systems, junction boxes, and sewers)
241/3201 – Wastewater surge tank (25,000 gal)
928/3202 – NLS-105 tank (15,000 gal)
928/3203 – Diversion tank (170,000 gal)
928/3205 – Transfer tank (30,000 gal)
432/3001 and 432/3002 – Equalization tanks (two, 1.25 million gal each)
432/3003 – Selector tank (70,000 gal)
432/3004 and 432/3005 – Aeration tanks (two)
421/5302 – Splitter box
421/5308 and 421/5309 – Clarifiers (two)
-- Containers
313/3004 – Storage tank (300,000 gal)

Applicable Regulation:
401 KAR 63:002, Section 2(4)(lll), 40 C.F.R. 63.2430 through 63.2550, Tables 1 through 12 (Subpart FFFF), National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing.
Note: Storage Tank 313/3004 is subject to 40 CFR 63, Subpart FFFF only when storing wastewater that is subject to 40 CFR 63, Subpart FFFF requirements as specified under 40 CFR 63.2435 and 40 CFR 63.2440.

Comments:
Emission factors for the Wastewater Treatment Operations were derived using EPA's WATER9 software.

240 Building:
EU#240: 240 Building Fugitive Emissions, EU#241: 240 Building Process Vents,
EU#242: 240 Building Benzene Storage Vessels,
and EU#245: 240 Thermal Oxidizer Products of Combustion

Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
HAPs (organic)	Reduce collective uncontrolled organic HAP emissions from the sum of all Group 1 batch process vents within the process by ≥ 98 percent by	40 CFR 63, Subpart FFFF, Table 2	0.3125 lb Acetaldehyde/ 1,000 lb product vented; 17.73 lb Benzene/ 1,000 lb product vented; 0.00116 lb Maleic	Vent to closed vent system and Thermal Oxidizer

240 Building: EU#240: 240 Building Fugitive Emissions, EU#241: 240 Building Process Vents, EU#242: 240 Building Benzene Storage Vessels, and EU#245: 240 Thermal Oxidizer Products of Combustion				
	weight by venting emissions from a sufficient number of the vents through one or more closed-vent systems to any combination of control devices (except a flare); or Reduce uncontrolled organic HAP emissions to an outlet concentration ≤ 20 ppmv as TOC or total organic HAP		Anhydride/ 1,000 lb product vented; 1.521 lb Toluene/ 1,000 lb product vented (all EF are pre-control) – see Comments below for EF basis	
HAPs (organic)	Group 1 Storage Tanks where the maximum true vapor pressure of total HAP at the storage temperature is <76.6 kilopascals, reduce total HAP emissions by ≥95 percent by weight or to ≤20 ppmv of TOC or organic HAP and ≤20 ppmv of hydrogen halide and halogen HAP	40 CFR 63, Subpart FFFF, Table 4	1.0 lb Benzene/ lb vented (EF is pre-control) – see Comments below for EF basis	Vent to closed vent system and Thermal Oxidizer

Initial Construction and Modification Dates:
1967, modified in 1968, 1992, 1993, 1994, and 2010.

Process Description:
The 240 Building produces copolymers of maleic anhydride (MA), methyl vinyl ether (MVE), isobutylene, and isopropyl acetate. The reactions use various proportions of reactants, solvents, and initiators. Product slurry is generated in the four reactors, stripped of un-reacted monomer (if needed) in the stripping tanks, and then pumped to holding tanks that feed into the three product dryers. Dried powder is mixed in six blenders, and packaged into drums, totes, super sacks, or air pallets. Some reactor products are not dried, but are transferred to tanks for storage or transferred directly to downstream processes. Vapors from the reactor system through the dryers are vented to a seal pot, and then incinerated.

The Unit includes the following equipment:
240/3303 – Reactor 1 (2,700 gal)
240/3307 – Reactor 3 (4,500 gal)
240/3308 – Reactor 4 (4,500 gal)
240/3309 – Reactor 2 (3,500 gal)
240/3501 – Dryer 2
240/3502 – Dryer 1
240/3503 – Dryer 3
240/3704 – Dryer product handling cyclone
240/3708 – Dryer product handling baghouse
240/3709 – Dryer product handling baghouse
240/3712 – Dryer product handling cyclone

240 Building:
EU#240: 240 Building Fugitive Emissions, EU#241: 240 Building Process Vents,
EU#242: 240 Building Benzene Storage Vessels,
and EU#245: 240 Thermal Oxidizer Products of Combustion

240/3713 – Dryer product handling baghouse
242/3001 – Benzene storage tank (12,700 gallon)
242/3002 – Benzene storage tank (12,700 gallon)
242/3005 – Benzene storage tank (40,000 gallon)
242/3104 – Maleic anhydride tank (9,000 gallon)
340/3013 – Toluene and other non-HAP storage tank (11,000 gal)
340/3014 – Toluene and other non-HAP storage tank (16,500 gal)
240/3201 – Catalyst pot
240/3202 – Receiver
240/3214 – Receiver
240/3215 – Receiver
240/3224 – Dryer feed tank (4500 gal)
240/3226 – Receiver
240/3229 – Blend / dryer feed tank
240/3233 – Blend / dryer feed tank
240/3241 – Catalyst pot
240/3243 – Catalyst pot
240/3253 – Strip tank
240/3254 – Dryer feed tank
240/3255 – Strip tank (60 gal)
240/32xx – Catalyst pot
240/3260 – Catalyst pot
240/3261 – Catalyst pot (3 gal)
240/3302 – Dryer feed tank
240/3304 – Dryer feed tank
-- Tank wagon loading (various locations)

Applicable Regulation:
401 KAR 57:002, Section 2, 40 C.F.R. 61 (Subpart FF), National Emission Standard for Benzene Waste Operations. Pursuant to 40 CFR 63.2535(j), compliance with 40 CFR 61, Subpart FF, for a Group 1 or Group 2 wastewater stream that is also subject to the provisions of 40 CFR 61.342(c) through (h), and is not exempt under 40 CFR 61.342(c)(2) or (3), the permittee may elect to comply only with the requirements for Group 1 wastewater streams in 40 CFR 63, Subpart FFFF. If a Group 2 wastewater stream is exempted from 40 CFR 61.342(c)(1) under 40 CFR 61.342(c)(2) or (3), then the permittee is required to comply only with the reporting and recordkeeping requirements specified in 40 CFR 63, Subpart FFFF for Group 2 wastewater streams, and the permittee is exempt from the requirements in 40 CFR part 61, Subpart FF.

401 KAR 57:002, Section 2, 40 C.F.R. 61 (Subpart J), National Emission Standard for Equipment Leaks (Fugitive Emission Sources) of Benzene. Pursuant to 40 CFR 61.112(a), each owner or operator subject to the provisions of 40 CFR 61, Subpart J shall comply with the requirements of 40 CFR 61, Subpart V.

401 KAR 57:002, Section 2, 40 C.F.R. 61 (Subpart V), National Emission Standard for Equipment Leaks (Fugitive Emission Sources). Pursuant to 40 CFR 63.2535(k), for the affected source with equipment that is also subject to the requirements of 40 CFR 61, Subpart V, the permittee may elect to apply 40 CFR 63,

240 Building:
EU#240: 240 Building Fugitive Emissions, EU#241: 240 Building Process Vents,
EU#242: 240 Building Benzene Storage Vessels,
and EU#245: 240 Thermal Oxidizer Products of Combustion

Subpart FFFF to all such equipment. If the permittee has an affected source with equipment to which 40 CFR 63, Subpart FFFF does not apply, but which is subject to the requirements of 40 CFR 61 Subpart V, the permittee may elect to apply 40 CFR 63, Subpart FFFF to all such equipment. The permittee shall consider all total organic compounds, minus methane and ethane, in such equipment for purposes of compliance with 40 CFR 63, Subpart FFFF, as if they were organic HAP. Compliance with the provisions of 40 CFR 63, Subpart FFFF, in the manner described in 40 CFR 63.2535(k), will constitute compliance with 40 CFR 61, Subpart V.

401 KAR 57:002, Section 2, 40 C.F.R. 61 (Subpart Y), National Emission Standard for Benzene Emissions from Benzene Storage Vessels. Pursuant to 40 CFR 63.2535(c), compliance with 40 CFR 61, Subpart Y, for benzene storage tanks 242/3001, 242/3002, and 242/3005 assigned to an MCPU that are also subject to control under 40 CFR 61, Subpart Y, the permittee may elect to comply only with the requirements for Group 1 storage tanks in 40 CFR 63, Subpart FFFF.

401 KAR 63:002, Section 2(4)(lll), 40 C.F.R. 63.2430 through 63.2550, Tables 1 through 12 (Subpart FFFF), National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing.

Non-applicable Regulation:
401 KAR 60:005, Section 2(2)(bbb), 40 C.F.R. 60.480 through 60.489 (Subpart VV), Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After January 5, 1981, and on or Before November 7, 2006. This regulation does not apply because the equipment used in the chemical manufacturing process does not meet the definition of a process unit, pursuant to 40 CFR 60.480(f): components assembled to produce, as intermediate or final products, one or more of the chemicals listed in 40 CFR 60.489.

401 KAR 60:005, Section 2(2)(ttt), 40 C.F.R. 60.700 through 60.708 (Subpart RRR), Standards of Performance for Volatile Organic Compound Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes. This regulation does not apply because the reactors at the source are not an affected facility since the process unit(s) do not produce any of the chemicals listed in 40 CFR 60.707 as a product, co-product, by-product, or intermediate. Additionally, 40 CFR 60.700(c)(1) exempts reactor processes designed and operated as a batch operation.

401 KAR 63:002, Section 2(4)(a), 40 C.F.R. 63.100 through 63.107, Tables 1 through 4 (Subpart F), National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(1): the unit(s) do not manufacture as a primary product a chemical listed in Table 1 of 40 CFR 63 Subpart F, tetrahydrobenzaldehyde, or crotonaldehyde.

401 KAR 63:002, Section 2(4)(b), 40 C.F.R. 63.110 through 63.153, Tables 1 through 37, and Figure 1 (Subpart G), National Emission Standards for Organic Hazardous Air Pollutants From the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and

240 Building:
EU#240: 240 Building Fugitive Emissions, EU#241: 240 Building Process Vents,
EU#242: 240 Building Benzene Storage Vessels,
and EU#245: 240 Thermal Oxidizer Products of Combustion

Wastewater. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(1): the unit(s) do not manufacture as a primary product a chemical listed in Table 1 of 40 CFR 63 Subpart F, tetrahydrobenzaldehyde, or crotonaldehyde.

401 KAR 63:002, Section 2(4)(c), 40 C.F.R. 63.160 through 63.183, Tables 1 through 4 (Subpart H), National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(1): the unit(s) do not manufacture as a primary product a chemical listed in Table 1 of 40 CFR 63 Subpart F, tetrahydrobenzaldehyde, or crotonaldehyde.

Comments:
Emission factors for the 240 Building Process Vents and Benzene Storage Vessels were established using EPA's guidance on quantifying Potential to Emit (PTE) of batch chemical processing units. This guidance is described in an EPA memo dated August 29, 1996, which also contains the EPA approved methodology suggested by the Synthetic Organic Chemical Manufacturers Association (SOCMA).

Emission factors for the Thermal Oxidizer products of combustion were based on AP-42, Chapter 1.

No 40 CFR 63, Subpart FFFF Group 1 continuous process vents or Group 1 transfer racks are part of a 240 Building MCPU. No heat exchange systems are subject to the monitoring requirements of 40 CFR 63.104 as referenced by 40 CFR 63.2490.

236 Building:
EU#361: 236 Building Process Vent Organics,
EU#362: Dryer 236/3501 – Cyclone 236/3701 Process Particulate,
EU#363: Dryer 236/3501 Natural Gas Combustion,
EU#364: Dryer 236/3503 – Cyclone 236/3708 Process Particulate,
EU#365: Dryer 236/3503 Natural Gas Combustion,
EU#366: 236 RTO Products of Combustion, and EU#36F: 236 Building Fugitive Emissions

Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
PM	2.34 lb/hr (For 236/3701 Cyclone for Dryer 236/3501 and 236/3708 Cyclone for Dryer 236/3503)	401 KAR 59:010, Section 3(2)	6.77 lb/1,000 lb vented (uncontrolled EF) – EF developed by Emission Master software	The permittee shall be in compliance based upon emissions information provided to the Division, and based on the following formula, PMt emissions (lbs/hr) = (processing rate)*(emission factor)*(1 – %CE)

236 Building: EU#361: 236 Building Process Vent Organics, EU#362: Dryer 236/3501 – Cyclone 236/3701 Process Particulate, EU#363: Dryer 236/3501 Natural Gas Combustion, EU#364: Dryer 236/3503 – Cyclone 236/3708 Process Particulate, EU#365: Dryer 236/3503 Natural Gas Combustion, EU#366: 236 RTO Products of Combustion, and EU#36F: 236 Building Fugitive Emissions				
				where PMt = Total Particulate Matter and %CE = Control Efficiency Monthly visual observations will be performed to indicate proper operation of the air pollution control equipment.
Opacity	20% (For 236/3701 Cyclone for Dryer 236/3501 and 236/3708 Cyclone for Dryer 236/3503)	401 KAR 59:010, Section 3(1)(a)	NA	Compliance is demonstrated by monthly visual observations and keeping records of the results of the monthly observations.
VOC	Less than 36 tons/year (For 236/3506 Drum Dryer)	To preclude 401 KAR 51:017	6.05 lb VOC per 1,000 lb vented (uncontrolled EF) – see Comments below for EF	Pursuant to 401 KAR 52:020, Section 10, the permittee shall keep records of the actual VOC emissions on a 12-month rolling basis.
HAPs (organic)	Reduce collective uncontrolled organic HAP emissions from the sum of all Group 1 batch process vents within the process by ≥ 98 percent by weight; or Reduce uncontrolled organic HAP emissions from one or more batch process vents within the process to an outlet concentration ≤ 20 ppmv as TOC or total organic HAP.	40 CFR 63, Subpart FFFF, Table 2	0.3815 lb Acetaldehyde/ 1,000 lb product vented, 1.422 lb Benzene/ 1,000 lb product vented, 0.0082 lb Styrene/ 1,000 lb product vented, 0.000945 lb Vinyl Acetate/ 1,000 lb product vented (All EF are pre-control) – see Comments below for EF basis	Vent to closed vent system and Thermal Oxidizer
Initial Construction and Modification Dates: 1967, modified in 1970, 1984, 1987, 1992, 1997, 1998, 2001, 2004 and 2006 **Process Description:** Many different batch processes are conducted in the 236 building. The 236 building also uses some materials produced in the 240 building. The 236 building can be roughly divided into the following process groupings: Polyclar, Gantrez-S, half-esters, PVP, and other miscellaneous processes. Solution products are shipped out via tank trucks or drums. Dry products are packaged in drums or totes.				

236 Building:
EU#361: 236 Building Process Vent Organics,
EU#362: Dryer 236/3501 – Cyclone 236/3701 Process Particulate,
EU#363: Dryer 236/3501 Natural Gas Combustion,
EU#364: Dryer 236/3503 – Cyclone 236/3708 Process Particulate,
EU#365: Dryer 236/3503 Natural Gas Combustion,
EU#366: 236 RTO Products of Combustion, and EU#36F: 236 Building Fugitive Emissions

The Unit includes the following equipment:
236/3004 – Process tank (6,000 gal)
236/3005 – Process tank (6,000 gal)
236/3006 – Process tank (15,000 gal)
236/3010 – Water tank (25,000 gal)
236/3203 – Hold tank (340 gal)
236/3221 – Reslurry tank (2,380 gal)
236/3229 – Blend tank (200 gal)
236/3234 – Cyclone separator
236/3251 – Blend tank (12,000 gal)
236/3259 – Blend tank (5,000 gal)
236/3277 – Dryer feed tank (8,000 gal)
236/3285 – Acid treatment tank (6,000 gal)
236/3286 – Acid treatment tank (6,000 gal)
236/3287 – Filter feed tank
236/3296 – Blend tank (12,000 gal)
236/3304 – Process tank
236/3305 – Process tank
236/3306 – Reactor (1,270 gal)
236/3309 – Process tank
236/3311 – Process tank
236/3312 – Process tank
236/3315 – Reactor (1,500 gal)
236/3319 – Reactor (1,900 gal)
236/3320 – Reactor (3,800 gal)
236/3321 – Reactor (1,900 gal)
236/3322 – Reactor (3,800 gal)
236/3323 – Reactor (3,000 gal)
236/3324 – Reactor (12,000 gal)
236/3327 – Reactor (3,800 gal)
236/3328 – Reactor (12,000 gal)
236/3329 – Reactor (3,000 gal)
236/3330 – Reactor (6,000 gal)
236/3331 – Reactor (3,200 gal)
236/3332 – Reactor (3,500 gal)
236/3333 – Reactor (3,500 gal)
236/3401 – Column
236/3501 – Spray dryer (836 lb/hr batch average solids, 7.5 mmBtu/hr natural gas firing rate)
236/3503 – Spray dryer (836 lb/hr batch average solids, 7.5 mmBtu/hr natural gas firing rate)
236/3504 – Drum dryer
236/3505 – Drum dryer

236 Building:
EU#361: 236 Building Process Vent Organics,
EU#362: Dryer 236/3501 – Cyclone 236/3701 Process Particulate,
EU#363: Dryer 236/3501 Natural Gas Combustion,
EU#364: Dryer 236/3503 – Cyclone 236/3708 Process Particulate,
EU#365: Dryer 236/3503 Natural Gas Combustion,
EU#366: 236 RTO Products of Combustion, and EU#36F: 236 Building Fugitive Emissions

236/3506 – Drum dryer
236/3509 – Drum dryer
236/36104 – Filter
236/36105 – Filter
236/3701 – Product recovery cyclone for dryer 3501
236/3708 – Product recovery cyclone for dryer 3503
236/32107 – Dryer feed tank (8,000 gal)
236124DR – Tank wagon loading
321/3030 – Storage tank (19,000 gal)

Applicable Regulation:
401 KAR 59:005, General provisions

401 KAR 59:010, New process operations

401 KAR 61:020, Existing process operations

401 KAR 63:002, Section 2(4)(lll), 40 C.F.R. 63.2430 through 63.2550, Tables 1 through 12 (Subpart FFFF), National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing

Non-applicable Regulation:
401 KAR 60:005, Section 2(2)(bbb), 40 C.F.R. 60.480 through 60.489 (Subpart VV), Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After January 5, 1981, and on or Before November 7, 2006. This regulation does not apply because the equipment used in the chemical manufacturing process does not meet the definition of a process unit, pursuant to 40 CFR 60.480(f): components assembled to produce, as intermediate or final products, one or more of the chemicals listed in 40 CFR 60.489.

401 KAR 60:005, Section 2(2)(ttt), 40 C.F.R. 60.700 through 60.708 (Subpart RRR), Standards of Performance for Volatile Organic Compound Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes. Pursuant to 40 CFR 60.700(c)(1), this regulation does not apply because the reactor processes in the 236 Building are designed and operated as batch operations.

401 KAR 63:002, Section 2(4)(a), 40 C.F.R. 63.100 through 63.107, Tables 1 through 4 (Subpart F), National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(1): the unit(s) do not manufacture as a primary product a chemical listed in Table 1 of 40 CFR 63 Subpart F, tetrahydrobenzaldehyde, or crotonaldehyde.

236 Building:
EU#361: 236 Building Process Vent Organics,
EU#362: Dryer 236/3501 – Cyclone 236/3701 Process Particulate,
EU#363: Dryer 236/3501 Natural Gas Combustion,
EU#364: Dryer 236/3503 – Cyclone 236/3708 Process Particulate,
EU#365: Dryer 236/3503 Natural Gas Combustion,
EU#366: 236 RTO Products of Combustion, and EU#36F: 236 Building Fugitive Emissions

401 KAR 63:002, Section 2(4)(b), 40 C.F.R. 63.110 through 63.153, Tables 1 through 37, and Figure 1 (Subpart G), National Emission Standards for Organic Hazardous Air Pollutants From the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(1): the unit(s) do not manufacture as a primary product a chemical listed in Table 1 of 40 CFR 63 Subpart F, tetrahydrobenzaldehyde, or crotonaldehyde.

401 KAR 63:002, Section 2(4)(c), 40 C.F.R. 63.160 through 63.183, Tables 1 through 4 (Subpart H), National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(1): the unit(s) do not manufacture as a primary product a chemical listed in Table 1 of 40 CFR 63 Subpart F, tetrahydrobenzaldehyde, or crotonaldehyde.

Precluded Regulations:
401 KAR 51:017, Prevention of significant deterioration of air quality.

Comments:
PM emission factors for the Dryers (process) were developed by Emission Master software. Emission factors for the Dryers (products of combustion) were based on AP-42, Chapter 1.

All other emission factors for the 236 Building were established using EPA's guidance on quantifying Potential to Emit (PTE) of batch chemical processing units. This guidance is described in an EPA memo dated August 29, 1996, which also contains the EPA approved methodology suggested by the Synthetic Organic Chemical Manufacturers Association (SOCMA).

No 40 CFR 63, Subpart FFFF Group 1 continuous process vents, Group 1 storage tanks, or Group 1 transfer racks are part of a 236 Building MCPU. No heat exchange systems are subject to the monitoring requirements of 40 CFR 63.104 as referenced by 40 CFR 63.2490.

315 Building:
EU#151: 315 Building Process Vent Organics,
EU#152: 315 Thermal Oxidizer Products of Combustion,
and EU#153: 315 Building Fugitive Emissions

Initial Construction and Modification Dates: 1956, modified in 1957, 1960, 1962, 1963, 1964, 1967, 1969, 1975, 1986, 1987, 1989, 1990, 1991, 1994, and 2001.

Process Description:
In the 315 building copolymers of polyvinylpyrrolidone (PVP) are produced. Vinylpyrrolidone (VP) and a solvent are charged reactors. The reaction is initiated, and the temperature is maintained. The remaining

**315 Building:
EU#151: 315 Building Process Vent Organics,
EU#152: 315 Thermal Oxidizer Products of Combustion,
and EU#153: 315 Building Fugitive Emissions**

amounts of VP and solvent are added followed by the initiator. The temperature is allowed to rise. When the monomer concentrations are below the specifications, the batch is cooled. The solids are adjusted after mixing with an additive. The product is then loaded into drums.

Gafquats are produced when vinylpyrrolidone (VP) is copolymerized with various organic salts in the presence of an initiator. Water or ethanol is typically used as a solvent. The heat of reaction is allowed to raise the batch temperature. The reactor temperature is maintained at the set point for a specific period of time. The batch is cooled and quaternization is initiated by using an additive. The solids are adjusted, filtered, and the final product is packed into drums.

Batch products other than the above vinyl pyrrolidone-based products are also made in the 315 building. Solution products are shipped out via tank trucks and drums. Dried products are packaged in drums or totes.

The Unit includes the following equipment:
305/3101 – Diethyl sulfate storage tank (11,500 gal)
315/3006 – Process tank
315/3007 – Process tank
315/3227 – Receiver (1500 gal)
315/3246 – Receiver (3000 gal)
315/3248 – Charge pot (13 gal)
315/3251 – Acrylic acid process tank (320 gal)
315/3275 – Charge pot (450 gal)
315/3276 – Charge pot (100 gal)
315/3281 – Catalyst pot (15 gal)
315/3282 – Catalyst pot (25 gal)
315/3283 – Catalyst pot (100 gal)
315/3290 – Receiver (180 gal)
315/3293 – Receiver (2500 gal)
315/3300 – Blend tank
315/3301 – Reactor (4,000 gal)
315/3302 – Reactor (4,000 gal)
315/3303 – Reactor (4,000 gal)
315/3304 – Reactor (4,000 gal)
315/3305 – Process tank (8,000 gal)
315/3306 – Reactor (4,500 gal)
315/3307 – Reactor (4,000 gal)
315/3308 – Process tank (8,000 gal)
315/3310 – Dryer/Feed Tank
315/3311 – Dryer
315/3312 – Reactor (2,500 gal)
315/3313 – Process tank (5,000 gal)
315/3315 – Reactor (4,500 gal)
315/3404 – Distillation column
315/3504 – Evaporator

315 Building:
EU#151: 315 Building Process Vent Organics,
EU#152: 315 Thermal Oxidizer Products of Combustion,
and EU#153: 315 Building Fugitive Emissions

315/3710 – Packaging bin
315024DR – Tank wagon loading
315074DR – Tank wagon loading

Applicable Regulation:
401 KAR 63:002, Section 2(4)(lll), 40 C.F.R. 63.2430 through 63.2550, Tables 1 through 12 (Subpart FFFF), National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing

Non-applicable Regulations:
401 KAR 63:002, Section 2(4)(a), 40 C.F.R. 63.100 through 63.107, Tables 1 through 4 (Subpart F), National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(1): the unit(s) do not manufacture as a primary product a chemical listed in Table 1 of 40 CFR 63 Subpart F, tetrahydrobenzaldehyde, or crotonaldehyde.

401 KAR 63:002, Section 2(4)(b), 40 C.F.R. 63.110 through 63.153, Tables 1 through 37, and Figure 1 (Subpart G), National Emission Standards for Organic Hazardous Air Pollutants From the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(1): the unit(s) do not manufacture as a primary product a chemical listed in Table 1 of 40 CFR 63 Subpart F, tetrahydrobenzaldehyde, or crotonaldehyde.

401 KAR 63:002, Section 2(4)(c), 40 C.F.R. 63.160 through 63.183, Tables 1 through 4 (Subpart H), National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(1): the unit(s) do not manufacture as a primary product a chemical listed in Table 1 of 40 CFR 63 Subpart F, tetrahydrobenzaldehyde, or crotonaldehyde.

401 KAR 60:005, Section 2(2)(bbb), 40 C.F.R. 60.480 through 60.489 (Subpart VV), Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After January 5, 1981, and on or Before November 7, 2006. This regulation does not apply because the equipment used in the chemical manufacturing process does not meet the definition of a process unit, pursuant to 40 CFR 60.480(f): components assembled to produce, as intermediate or final products, one or more of the chemicals listed in 40 CFR 60.489.

401 KAR 60:005, Section 2(2)(ppp), 40 C.F.R. 60.660 through 60.668 (Subpart NNN), Standards of Performance for Volatile Organic Compound (VOC) Emissions From Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations. Pursuant to 40 CFR 60.660(c)(3), this regulation does not apply because the distillation units in the 315 Building are designed and operated as batch operations.

315 Building: EU#151: 315 Building Process Vent Organics, EU#152: 315 Thermal Oxidizer Products of Combustion, and EU#153: 315 Building Fugitive Emissions
401 KAR 60:005, Section 2(2)(ttt), 40 C.F.R. 60.700 through 60.708 (Subpart RRR), Standards of Performance for Volatile Organic Compound Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes. Pursuant to 40 CFR 60.700(c)(1), this regulation does not apply because the reactor processes in the 315 Building are designated and operated as batch operations. **Comments:** Emission factors for the Thermal Oxidizer products of combustion were based on AP-42, Chapter 1. All other emission factors for the 315 Building were established using EPA's guidance on quantifying Potential to Emit (PTE) of batch chemical processing units. This guidance is described in an EPA memo dated August 29, 1996, which also contains the EPA approved methodology suggested by the Synthetic Organic Chemical Manufacturers Association (SOCMA). No 40 CFR 63, Subpart FFFF Group 1 continuous process vents, Group 1 batch process vents, Group 1 storage tanks, or Group 1 transfer racks are part of a 315 Building MCPU. No heat exchange systems are subject to the monitoring requirements of 40 CFR 63.104 as referenced by 40 CFR 63.2490.

200 Building:
EU#001: 200 Building Process Vent Organics,
EU#002: Steam Spray Dryer and Cyclone Collectors Process Particulate,
EU#003: Gas Spray Dryer and Cyclone Collectors Process Particulate,
EU#004: Gas Spray Dryer Natural Gas Combustion, and EU#005: 200 Building Fugitive Emissions

Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
PM	2.34 lbs/hr (Steam Spray Dryer 200/3501, Gas Spray Dryer 200/3502);	401 KAR 59:010, Section 3(2)	15.3 lb PM/1,000 lb processed (Steam Spray Dryer 200/3501); 41 lb PM/1,000 lb processed (Gas Spray Dryer 200/3502); *See comments below for EF basis	Compliance is averaged over a period that covers a complete operation of the batch process and is based on the following formula: PM_t emissions (lbs/hr) = (processing rate)*(emission factor)*(1 – %CE) where PM_t = Total Particulate Matter %CE = Control Efficiency
Opacity	20%	401 KAR 59:010, Section 3(1)(a)	NA	Monthly visual observations and keeping records of the results of the observations

Initial Construction and Modification Dates: 1955, 1964, 1965, 1966, 1993, 1997, 1998 and 2004.

200 Building:
EU#001: 200 Building Process Vent Organics,
EU#002: Steam Spray Dryer and Cyclone Collectors Process Particulate,
EU#003: Gas Spray Dryer and Cyclone Collectors Process Particulate,
EU#004: Gas Spray Dryer Natural Gas Combustion, and EU#005: 200 Building Fugitive Emissions

Process Description:
The 200 building is used to produce several products, each with many grades. Several grades of alkylated polyvinylpyrrolidone (Ganex) are produced by charging the reactor with vinylpyrrolidone (VP), an olefin, an initiator, and alcohol as a diluent. After the reaction, the batch is cooled. IPA is distilled off at lower pressure. The batch is heated, and nitrogen is sparged. When the desired solids content of the batch is achieved, the product is filtered, cooled, and packaged. Several grades of polyvinylpyrrolidones (PVP) are produced by batch polymerization of N-vinyl-2-pyrrolidone (VP). The reactor is purged with nitrogen and VP is charged to the reactor with initiators. The heat of reaction raises the batch temperature. Cooling water is used to control the temperature. At the end of the reaction, pH is adjusted and the batch is cooled. Some products are dried in one of two spray dryers. Others are transferred as liquid to storage.
The Unit includes the following equipment:
200/3204 – Dryer feed tank (100 gal)
200/3207 – Dryer feed tank (570 gal)
200/3003 – Process tank, vent 200029SG (4000 gal)
200/3005 – Process tank, vent 200032SG (4000 gal)
200/3006 – Process tank, vent 200033SG (8000 gal)
200/3009 – Process tank, vent 200047SG (4000 gal)
200/3010 – Process tank, vent 200048SG (4000 gal)
200/3011 – Process tank, vent 200049SG (4000 gal)
200/3301 – Reactor (1,000 gal)
200/3302 – Reactor (1,000 gal)
200/3303 – Reactor (4,000 gal)
200/3304 – Reactor (4,000 gal)
200/3501 – Steam spray dryer (740 lb/hr batch average solids)
200/3502 – Gas spray dryer (1,500 lb/hr batch average solids, 11 mmBtu/hr natural gas firing rate)
200/3701 – Primary cyclone process collector for steam spray dryer
200/3702 – Primary cyclone process collector for steam spray dryer
200/3705 – Primary cyclone process collector for gas spray dryer
200/3717 – Secondary cyclone process collector for steam spray dryer
200/3718 – Secondary cyclone process collector for gas spray dryer

Applicable Regulation:
401 KAR 59:005, General provisions

401 KAR 59:010, New process operations

401 KAR 63:002, Section 2(4)(lll), 40 C.F.R. 63.2430 through 63.2550, Tables 1 through 12 (Subpart FFFF), National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing

40 CFR 64, Compliance Assurance Monitoring (CAM), applies to the 200 Gas Spray Dryer and the control of particulate matter by the Venturi Scrubber 200/5369

200 Building:
EU#001: 200 Building Process Vent Organics,
EU#002: Steam Spray Dryer and Cyclone Collectors Process Particulate,
EU#003: Gas Spray Dryer and Cyclone Collectors Process Particulate,
EU#004: Gas Spray Dryer Natural Gas Combustion, and EU#005: 200 Building Fugitive Emissions

Non-applicable Regulation:

401 KAR 60:005, Section 2(2)(bbb), 40 C.F.R. 60.480 through 60.489 (Subpart VV), Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After January 5, 1981, and on or Before November 7, 2006. This regulation does not apply because the equipment used in the chemical manufacturing process does not meet the definition of a process unit, pursuant to 40 CFR 60.480(f): components assembled to produce, as intermediate or final products, one or more of the chemicals listed in 40 CFR 60.489.

401 KAR 60:005, Section 2(2)(ttt), 40 C.F.R. 60.700 through 60.708 (Subpart RRR), Standards of Performance for Volatile Organic Compound Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes. Pursuant to 40 CFR 60.700(c)(1), this regulation does not apply because the reactor processes in the 200 Building are designed and operated as batch operations.

401 KAR 63:002, Section 2(4)(a), 40 C.F.R. 63.100 through 63.107, Tables 1 through 4 (Subpart F), National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(1): the unit(s) do not manufacture as a primary product a chemical listed in Table 1 of 40 CFR 63 Subpart F, tetrahydrobenzaldehyde, or crotonaldehyde.

401 KAR 63:002, Section 2(4)(b), 40 C.F.R. 63.110 through 63.153, Tables 1 through 37, and Figure 1 (Subpart G), National Emission Standards for Organic Hazardous Air Pollutants From the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(1): the unit(s) do not manufacture as a primary product a chemical listed in Table 1 of 40 CFR 63 Subpart F, tetrahydrobenzaldehyde, or crotonaldehyde.

401 KAR 63:002, Section 2(4)(c), 40 C.F.R. 63.160 through 63.183, Tables 1 through 4 (Subpart H), National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(1): the unit(s) do not manufacture as a primary product a chemical listed in Table 1 of 40 CFR 63 Subpart F, tetrahydrobenzaldehyde, or crotonaldehyde.

Comments:

Emission factors for the Gas Spray Dryer products of combustion were based on AP-42, Chapter 1.

Emission factors for the Process Vent Organics and Fugitive Emissions were established using EPA's guidance on quantifying Potential to Emit (PTE) of batch chemical processing units. This guidance is described in an EPA memo dated August 29, 1996, which also contains the EPA approved methodology suggested by the Synthetic Organic Chemical Manufacturers Association (SOCMA).

200 Building:
EU#001: 200 Building Process Vent Organics,
EU#002: Steam Spray Dryer and Cyclone Collectors Process Particulate,
EU#003: Gas Spray Dryer and Cyclone Collectors Process Particulate,
EU#004: Gas Spray Dryer Natural Gas Combustion, and EU#005: 200 Building Fugitive Emissions

All other emission factors were developed with Emission Master software.

No 40 CFR 63, Subpart FFFF Group 1 continuous process vents, Group 1 batch process vents, Group 1 storage tanks, or Group 1 transfer racks are part of a 200 Building MCPU. No heat exchange systems are subject to the monitoring requirements of 40 CFR 63.104 as referenced by 40 CFR 63.2490. There is no equipment in organic HAP service, as defined in 40 CFR 63.2550.

APE20230002 and APE20200001: Baghouse (200/3641) was to be replaced with a Venturi Scrubber (200/53XX). Primary Process Cyclones (200/3701, 200/3702, 200/3717) were to be replaced with like units. The new venturi scrubber has an estimated 95% control efficiency of all particulate matter that is calculated based on the design parameters and a liquid flow rate of 10 gal/1000acf, with a total pressure drop of 5.56 in. W.C. However, this project never occurred and so the equipment and permit were returned to previous issued permit V-18-036 or V-18-036 R1 text.

334 Building:
EU#341: 334 Building Process Vents

Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
PM	2.34 lb/hr	401 KAR 59:010, Section 3(2)	0.404 lb PM/ 1,000 lb processed – see Comments below for EF basis	Retain initial permit calculations or test results indicating that particulate emissions are less than the 401 KAR 59:010 allowable emission rate averaged over a period that covers a complete operation of the batch process.
Opacity	20%	401 KAR 59:010, Section 3(1)(a)	NA	Compliance is demonstrated by performing monthly visual observations and keeping records of the results of the observations.

Initial Construction and Modification Dates: 1988, modified in 1989

Process Description:
PVP-I is prepared in the 334 building by reacting iodine prills with polyvinylpyrrolidone (PVP) powder. The reaction occurs at controlled conditions in a tumbler mixer to form an iodide complex in the presence of water. The slurry is then dried and packaged into drums.

The Unit includes the following equipment:
334/3506 – Reactor #1
334/3507 – Reactor #2
334/3715 – Surge hopper
334/3716 – Product recovery cyclone for blender 3717 (650.5 lb/hr batch average process weight)
334/3717 – Ribbon blender

334 Building:
EU#341: 334 Building Process Vents

Applicable Regulation:
401 KAR 59:005, General provisions.

401 KAR 59:010, New process operations.

Non-applicable Regulation:
401 KAR 60:005, Section 2(2)(bbb), 40 C.F.R. 60.480 through 60.489 (Subpart VV), Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After January 5, 1981, and on or Before November 7, 2006. This regulation does not apply because the equipment used in the chemical manufacturing process does not meet the definition of a process unit, pursuant to 40 CFR 60.480(f): components assembled to produce, as intermediate or final products, one or more of the chemicals listed in 40 CFR 60.489.

401 KAR 60:005, Section 2(2)(ttt), 40 C.F.R. 60.700 through 60.708 (Subpart RRR), Standards of Performance for Volatile Organic Compound Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes. Pursuant to 40 CFR 60.700(c)(1), this regulation does not apply because the reactor processes in the 334 Building are designed and operated as batch operations.

401 KAR 63:002, Section 2(4)(a), 40 C.F.R. 63.100 through 63.107, Tables 1 through 4 (Subpart F), National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(1): the unit(s) do not manufacture as a primary product a chemical listed in Table 1 of 40 CFR 63 Subpart F, tetrahydrobenzaldehyde, or crotonaldehyde.

401 KAR 63:002, Section 2(4)(b), 40 C.F.R. 63.110 through 63.153, Tables 1 through 37, and Figure 1 (Subpart G), National Emission Standards for Organic Hazardous Air Pollutants From the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(1): the unit(s) do not manufacture as a primary product a chemical listed in Table 1 of 40 CFR 63 Subpart F, tetrahydrobenzaldehyde, or crotonaldehyde.

401 KAR 63:002, Section 2(4)(c), 40 C.F.R. 63.160 through 63.183, Tables 1 through 4 (Subpart H), National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(1): the unit(s) do not manufacture as a primary product a chemical listed in Table 1 of 40 CFR 63 Subpart F, tetrahydrobenzaldehyde, or crotonaldehyde.

401 KAR 63:002, Section 2(4)(lll), 40 C.F.R. 63.2430 through 63.2550, Tables 1 through 12 (Subpart FFFF), National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing. Pursuant to 40 CFR 63.2435(b), this regulation does not apply because the MCPU does not satisfy the condition specified in 40 CFR 63.2435(b)(2): the MCPU does not process, use, or generate any of the organic HAP listed in section 112(b) of the CAA or hydrogen halide and halogen HAP, as defined in 40 CFR 63.2550.

334 Building:
EU#341: 334 Building Process Vents

Comments:
Emission factors for the 334 Building were established using EPA's guidance on quantifying Potential to Emit (PTE) of batch chemical processing units. This guidance is described in an EPA memo dated August 29, 1996, which also contains the EPA approved methodology suggested by the Synthetic Organic Chemical Manufacturers Association (SOCMA).

243 Building
EU#AF1: 243 Building Process Vent VOC Emissions
EU#AF2: 243 Building Fugitive VOC Emissions

Initial Construction and Modification Dates: 2023

Process Description:
The process takes an existing base polymer and reacts it with additives to create a longer polymer chain, adding water, antifoam and biocides to create the finished product. The solids handling system controls the dry material added to reactor and consists of three hoppers, two dust collectors and a local area ventilation system. The final product is packaged either from the mix tank or product storage tanks into drums, totes and tank trucks.

The Unit includes the following equipment:
243/3201 - Process Feed Tank (17,966 gal)
243/3202 - Bulk Storage Tank (5,794 gal)
243/3203 - Bulk Storage Tank (5,794 gal)
243/3204 - Bulk Storage Tank (17,966 gal)
243/3205 - Bulk Storage Tank (17,966 gal)
243/3206 - Bulk Storage Tank (17,966 gal)
243/3207 - Mix Tank (4,069 gal)
243/3208 - Process Feed Tank (157 gal)
243/3209 - Process Feed Tank (484 gal)
243/3210 - Process Feed Tank (484 gal)
243/3211 - Process Feed Tank (484 gal)
243/3212 - Process Feed Tank (334 gal)
243/3215 - Process Feed Tank (334 gal)
243/3216 - Process Tank (8,567 gal)
243/3218 - Process Tank (700 gal)
243/3219 - Process Tank (14 gal)
243/3220 - Process Tank (10 gal)
243/3221 - Knockout Pot (25 gal)
243/3223 - Process Tank (1 gal)
243/3301 - Reactor (1,980 liters)
-- Tank Wagon Loading
-- Drum and Tote Filling

243 Building
EU#AF1: 243 Building Process Vent VOC Emissions
EU#AF2: 243 Building Fugitive VOC Emissions

Applicable Regulation:
401 KAR 63:002, Section 2(4)(lll), 40 C.F.R. 63.2430 through 63.2550, Tables 1 through 12 (Subpart FFFF), National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing.

401 KAR 63:002, Section 2(1), 40 C.F.R. 63.1 through 63.16, Table 1 (Subpart A), General Provisions.

Non-applicable Regulation:
401 KAR 60:005, Section 2(1), 40 C.F.R. 60.1 through 60.19, Table 1 (Subpart A), General provisions since there are no applicable requirements from 40 CFR Part 60.

401 KAR 60:005, Section 2(2)(r), 40 C.F.R. 60.110b through 60.117b (Subpart Kb) Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984

40 C.F.R. 60.480b through 60.489 (Subpart VVb), Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After April 25, 2023. This regulation does not apply because the equipment used in the chemical manufacturing process does not meet the definition of a process unit, pursuant to 40 CFR 60.480(f): components assembled to produce, as intermediate or final products, one or more of the chemicals listed in 40 CFR 60.489.

40 C.F.R. 60.700a through 60.710a (Subpart RRRa), Standards of Performance for Volatile Organic Compound Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes for Which Construction, Reconstruction, or Modification Commenced After April 25, 2023. Pursuant to 40 CFR 60.700(c)(1), this regulation does not apply because the reactor processes in the 334 Building are designed and operated as batch operations.

401 KAR 63:002, Section 2(4)(a), 40 C.F.R. 63.100 through 63.107, Tables 1 through 4 (Subpart F), National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(1): the unit(s) do not manufacture as a primary product a chemical listed in Table 1 of 40 CFR 63 Subpart F, tetrahydrobenzaldehyde, or crotonaldehyde.

401 KAR 63:002, Section 2(4)(b), 40 C.F.R. 63.110 through 63.153, Tables 1 through 37, and Figure 1 (Subpart G), National Emission Standards for Organic Hazardous Air Pollutants From the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(1): the unit(s) do not manufacture as a primary product a chemical listed in Table 1 of 40 CFR 63 Subpart F, tetrahydrobenzaldehyde, or crotonaldehyde.

243 Building EU#AF1: 243 Building Process Vent VOC Emissions EU#AF2: 243 Building Fugitive VOC Emissions
401 KAR 63:002, Section 2(4)(c), 40 C.F.R. 63.160 through 63.183, Tables 1 through 4 (Subpart H), National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(1): the unit(s) do not manufacture as a primary product a chemical listed in Table 1 of 40 CFR 63 Subpart F, tetrahydrobenzaldehyde, or crotonaldehyde. **Comments:** No equipment in the 234 Building is subject to emission limitations or work practice standards under 40 CFR 63, Subpart FFFF. There are no process vent steam, storage tanks, or equipment leaks in ethylene oxide service as defined in 40 CFR 63.2550(i). The general requirements for equipment not subject to emission limitations or work practice standards under 40 CFR 63, Subpart FFFF are specified in the permit under Group Requirements. The facility has also shown by calculations using Emissions Master that the worst case uncontrolled ethylene oxide emissions from each MCPU will be less than 5lb/year. The facility has calculated using the procedures in 40 CFR 63.2492(b)(2) that the percent ethylene oxide in storage tanks does not exceed 0.1 percent by weight. Also, there are no equipment leaks in ethylene oxide service as the percent ethylene oxide in process fluids does not exceed 0.1 percent by weight.

Higher Vinyl Ethers (HVE) Unit: EU#261: HVE Unit Process Vent Emissions, and EU#262: HVE Unit Fugitive Emissions				
Pollutant	**Emission Limit or Standard**	**Regulatory Basis for Emission Limit or Standard**	**Emission Factor Used and Basis**	**Compliance Method**
Opacity	20% for more than 3 minutes per day	401 KAR 63:015, Section 3	NA	Whenever emissions are vented to the Flare for combustion, maintain daily records of whether any air emissions were visible from the flare. If visible emissions are observed or it is requested by the Division, the permittee shall perform a Method 22 reading for the flare. The readings shall be recorded in a daily log. Maintain records of all routine and non-routine maintenance activities performed at the flare and any actions taken to correct the problem, if visual emissions are observed.
VOC	Less than 36 tpy (for VP1(02), VP1(03), 261(02) and	To preclude 401 KAR 51:017	1,000 lbs VOC per 1,000 lbs flared (98% destruction) or per 1,000 lbs	Calculate total VOC emissions on a 12-month rolling basis and maintain records

Higher Vinyl Ethers (HVE) Unit: EU#261: HVE Unit Process Vent Emissions, and EU#262: HVE Unit Fugitive Emissions				
	261(03) combined)		vented - see comments below for EF basis	

Initial Construction and Modification Dates: 1956, modified in 1962

Process Description:
A variety of high molecular weight vinyl ethers are produced in a batch process in the 326 area. Raw materials are heated to reflux in a prep kettle. Using the prep kettle vacuum, a solution of potassium hydroxide (KOH) is drawn into the kettle from the melt pot. Water from the KOH solution is removed by refluxing. The batch is then heated and pumped to a reactor.

The reaction occurs by sparging a mixture of acetylene/propane through the batch. Unreacted gas from the top of the reactor is released through a cooler to a buffer tank where acetylene/propane is added. Vapors from the gas in the cooler are separated and returned to the reactor. The batch is then transferred to the degasser, where residual acetylene/propane is removed by sparging with nitrogen. After sparging, the degasser is discharged either to the unit, a tank wagon, or to drums.

The Unit includes the following equipment:
326/3301 – Prep kettle
326/3302 – Reactor A
326/3303 – Reactor B
-- Tank wagon loading
-- Acetylene feed system

Applicable Regulations:
401 KAR 63:015, Flares

401 KAR 63:002, Section 2(4)(lll), 40 C.F.R. 63.2430 through 63.2550, Tables 1 through 12 (Subpart FFFF), National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing

Non-applicable Regulations:
401 KAR 60:005, Section 2(2)(bbb), 40 C.F.R. 60.480 through 60.489 (Subpart VV), Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After January 5, 1981, and on or Before November 7, 2006. This regulation does not apply because the equipment used in the chemical manufacturing process does not meet the definition of a process unit, pursuant to 40 CFR 60.480(f): components assembled to produce, as intermediate or final products, one or more of the chemicals listed in 40 CFR 60.489.

401 KAR 60:005, Section 2(2)(ttt), 40 C.F.R. 60.700 through 60.708 (Subpart RRR), Standards of Performance for Volatile Organic Compound Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes. This regulation does not apply because the reactors at the source are not an affected facility since the process unit(s) do not produce any of the chemicals listed in 40 CFR 60.707 as a product, co-product, by-product, or intermediate.

Higher Vinyl Ethers (HVE) Unit:
EU#261: HVE Unit Process Vent Emissions, and EU#262: HVE Unit Fugitive Emissions

401 KAR 63:002, Section 2(4)(a), 40 C.F.R. 63.100 through 63.107, Tables 1 through 4 (Subpart F), National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(1): the unit(s) do not manufacture as a primary product a chemical listed in Table 1 of 40 CFR 63 Subpart F, tetrahydrobenzaldehyde, or crotonaldehyde.

401 KAR 63:002, Section 2(4)(b), 40 C.F.R. 63.110 through 63.153, Tables 1 through 37, and Figure 1 (Subpart G), National Emission Standards for Organic Hazardous Air Pollutants From the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(1): the unit(s) do not manufacture as a primary product a chemical listed in Table 1 of 40 CFR 63 Subpart F, tetrahydrobenzaldehyde, or crotonaldehyde.

401 KAR 63:002, Section 2(4)(c), 40 C.F.R. 63.160 through 63.183, Tables 1 through 4 (Subpart H), National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks. Pursuant to 40 CFR 63.100(b), this regulation does not apply because the chemical manufacturing process unit(s) do not meet the criteria specified in 40 CFR 63.100(b)(1): the unit(s) do not manufacture as a primary product a chemical listed in Table 1 of 40 CFR 63 Subpart F, tetrahydrobenzaldehyde, or crotonaldehyde.

Precluded Regulation:
401 KAR 51:017, Prevention of significant deterioration of air quality.

Comments:
Emission factors for the HVE Unit Fugitives and HVE Process Vent and Acetylene Feed to atmosphere were established using EPA's guidance on quantifying Potential to Emit (PTE) of batch chemical processing units. This guidance is described in an EPA memo dated August 29, 1996, which also contains the EPA approved methodology suggested by the Synthetic Organic Chemical Manufacturers Association (SOCMA).

Emission factors for the HVE Process Vent sent to the flare were developed by Emission Master software.

The synthetic minor limit for total VOC emissions from VP1(02), VP1(03), 261(02) and 261(03) of 36 tons per year was established under permit V-06-052 R2.

No 40 CFR 63, Subpart FFFF Group 1 continuous process vents, Group 1 batch process vents, Group 1 storage tanks, or Group 1 transfer racks are part of a HVE unit MCPU. No heat exchange systems are subject to the monitoring requirements of 40 CFR 63.104 as referenced by 40 CFR 63.2490. There is no equipment in organic HAP service, as defined in 40 CFR 63.2550.

Wickes Boiler: EU#0AC: Wickes Boiler 115/5304 East Paracymene Heater: EU#0AD: East (Struthers) Paracymene Heater 115/5306 West Paracymene Heater: EU#WPH: West (First Thermal Systems) Paracymene Heater 126/5301				
Pollutant	**Emission Limit or Standard**	**Regulatory Basis for Emission Limit or Standard**	**Emission Factor Used and Basis**	**Compliance Method**
PM	0.344 lb/mmBtu (Wickes); 0.44 lb/mmBtu (E. Paracymene); 0.53 lb/mmBtu (W. Paracymene)	401 KAR 59:015, Section 4(1)	2.42 lb PM/mmscf (BLO hydrogen), 7.6 lb PM/mscf (natural gas) – see Comments below for EF basis	While burning natural gas or BLO hydrogen by-product, the permittee shall be assumed to be in compliance.
SO_2	1.30 lb/mmBtu (Wickes); 1.94 lb/mmBtu (E. Paracymene); 2.70 lb/mmBtu (W. Paracymene)	401 KAR 59:015, Section 5(1)	0.6 lb SO_2/mmscf (natural gas) – see Comments below for EF basis	
Opacity	20%	401 KAR 59:015, Section 4(2)	NA	

Initial Construction Date: Wickes Boiler – 1958, modified 2003; E. Paracymene Boiler – 1961, modified 2007; W. Paracymene – 1990, modified 2001

Process Description:

0AC WICKES BOILER 115/5304

Rated capacity 79 mmBtu/hr heat input
Natural Gas and Hydrogen Fired

01 **Wickes – BLO Hydrogen By-Product**
Controls: None

02 **Wickes – Natural Gas**
Controls: None

0AD EAST (STRUTHERS) PARACYMENE HEATER 115/5306

Rated capacity 19 mmBtu/hr heat input
Natural Gas and Hydrogen Fired

02 **East Paracymene – Natural Gas**
Controls: None

03 **East Paracymene – BLO Hydrogen By-Product**
Controls: None

Wickes Boiler: EU#0AC: Wickes Boiler 115/5304
East Paracymene Heater: EU#0AD: East (Struthers) Paracymene Heater 115/5306
West Paracymene Heater: EU#WPH: West (First Thermal Systems) Paracymene Heater 126/5301

WPH WEST (FIRST THERMAL SYSTEMS) PARACYMENE HEATER 126/5301

Rated capacity 13 mmBtu/hr heat input
Natural Gas and Hydrogen Fired

02 **W Paracymene – Natural Gas**
Controls: None

03 **W Paracymene – BLO Hydrogen By-Product**
Controls: None

Applicable Regulations:
401 KAR 59:005, General provisions

401 KAR 59:015, New indirect heat exchangers

401 KAR 60:005, Section 2(2)(d), 40 C.F.R. 60.40c through 60.48c (Subpart Dc), Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

401 KAR 63:002, Section 2(4)(iiii), 40 C.F.R. 63.7480 through 63.7575, Tables 1 through 13 (Subpart DDDDD), National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters.

Comments:
Emission factors for the boilers are from AP-42, Chapter 1. The heat content for natural gas combustion is based on the value in AP-42, Table 1.4-1. The heat content for hydrogen combustion is based on Perry's Table 9-30.

As specified at 63.7500(e), boilers and process heaters in the units designed to burn gas 1 fuels subcategory are not subject to the emission limits in Tables 1 and 2 or 11 through 13 to Subpart DDDDD, or the operating limits in Table 4 to Subpart DDDDD.

Holman Boiler: EU#0AE: Holman Boiler				
Pollutant	**Emission Limit or Standard**	**Regulatory Basis for Emission Limit or Standard**	**Emission Factor Used and Basis**	**Compliance Method**
PM	0.10 lb/mmBtu	401 KAR 59:015, Section 4(1)	7.6 lb PM/mmscf – see Comments below for EF basis	While burning natural gas the permittee shall be assumed to be in compliance.
SO_2	0.80 lb/mmBtu	401 KAR 59:015, Section 5(1)	0.6 lb SO_2/mmscf – see Comments below for EF basis	
Opacity	20%	401 KAR 59:015, Section 4(2)	NA	
Initial Construction and Modification Dates: Constructed 1992, installed at ISP in 2009				

Holman Boiler: EU#0AE: Holman Boiler

Process Description:

0AE HOLMAN BOILER
Rated capacity 88 mmBtu/hr heat input
Natural Gas Fired
01 **Holman Boiler – Natural Gas**
Controls: None

Applicable Regulations:
401 KAR 59:005, General provisions

401 KAR 59:015, New indirect heat exchangers

401 KAR 60:005, Section 2(2)(d), 40 C.F.R. 60.40c through 60.48c (Subpart Dc), Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

401 KAR 63:002, Section 2(4)(iiii), 40 C.F.R. 63.7480 through 63.7575, Tables 1 through 13 (Subpart DDDDD), National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters

Non-applicable Regulation:
401 KAR 60:005, Section 2(2)(c), 40 C.F.R. 60.40b through 60.49b (Subpart Db), Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units. This regulation does not apply because the Holman Boiler has a capacity of less than 100 mmBtu/hr.
Comments:
Emission factors for the Holman Boiler are from AP-42, Chapter 1. The heat content for natural gas combustion is based on the value in AP-42, Table 1.4-1.

As specified at 63.7500(e), boilers and process heaters in the units designed to burn gas 1 fuels subcategory are not subject to the emission limits in Tables 1 and 2 or 11 through 13 to Subpart DDDDD, or the operating limits in Table 4 to Subpart DDDDD.

Rentech Boilers:
EU#0AF: Rentech Boiler #1, EU#0AG: Rentech Boiler #2, and EU#0AH: Rentech Boiler #3

Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
PM	0.10 lb/mmBtu	401 KAR 59:015, Section 4(1)	7.6 lb PM/mmscf – see Comments below for EF basis	While burning natural gas the permittee shall be assumed to be in compliance.
SO_2	0.80 lb/mmBtu	401 KAR 59:015, Section 5(1)	0.6 lb SO_2/mmscf – see Comments below for EF basis	
Opacity	20%	401 KAR 59:015, Section 4(2)	NA	

Rentech Boilers:
EU#0AF: Rentech Boiler #1, EU#0AG: Rentech Boiler #2, and EU#0AH: Rentech Boiler #3

Initial Construction Date: 2013
Process Description:

0AF RENTECH BOILER #1
Rated capacity 69.6 mmBtu/hr heat input (HHV)
Construction Commenced: 2013
Natural Gas Fired
01 **Rentech #1 – Natural Gas**
Controls: None

0AG RENTECH BOILER #2
Rated capacity 69.6 mmBtu/hr heat input (HHV)
Construction Commenced: 2013
Natural Gas Fired
01 **Rentech #2 – Natural Gas**
Controls: None

0AH RENTECH BOILER #3
Rated capacity 69.6 mmBtu/hr heat input (HHV)
Construction Commenced: 2013
Natural Gas Fired
01 **Rentech #3 – Natural Gas**
Controls: None

Applicable Regulation:
401 KAR 59:005, General provisions

401 KAR 59:015, New indirect heat exchangers

401 KAR 60:005, Section 2(2)(d), 40 C.F.R. 60.40c through 60.48c (Subpart Dc), Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

401 KAR 63:002, Section 2(4)(iiii), 40 C.F.R. 63.7480 through 63.7575, Tables 1 through 13 (Subpart DDDDD), National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters.

Comments:
Emission factors for NO_X and CO emissions were based on vendor specifications. All other emission factors were based on AP-42, Chapter 1.

As specified at 63.7500(e), boilers and process heaters in the units designed to burn gas 1 fuels subcategory are not subject to the emission limits in Tables 1 and 2 or 11 through 13 to Subpart DDDDD, or the operating limits in Table 4 to Subpart DDDDD.

Cooling Towers: EU#CT1: North and South Cooling Towers				
Pollutant	**Emission Limit or Standard**	**Regulatory Basis for Emission Limit or Standard**	**Emission Factor Used and Basis**	**Compliance Method**
PM	2.34 lb/hr each	401 KAR 59:010, Section 3(2)	0.83 lb PM/mmgal	Assumed to be in compliance based upon emissions information provided to the Division.
Opacity	20%	401 KAR 59:010, Section 3(1)	NA	Compliance is demonstrated by performing monthly visual observations and keeping records of the results of the observations.

Initial Construction Date: 1956, 1960, 1966, 1985, respectively. North Cooling Towers replaced in 2012. South Cooling Towers replaced in 2017.

Applicable Regulation:
401 KAR 59:010, New process operations.

Non-applicable Regulation:
401 KAR 63:002, Section 2(4)(j), 40 C.F.R. 63.400 through 63.407, Table 1 (Subpart Q), National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers. Pursuant to 40 CFR 63.400, the provisions of Subpart Q do not apply to industrial process cooling towers that were not operated with chromium-based water treatment chemicals on or after September 8, 1994.

Comments:
Emission factors for the Cooling Towers were derived from AP-42, Chapter 13.4, and adjusted for the site specific Total Dissolved Solids rating of 503 ppm. Detailed calculations were provided in a response to NOD, received by the Division on January 24, 2007.

APE20230002:
Total throughput reduced to 1,410,000 gallons/hr
Both north cooling towers were replaced in 2012 and have a capacity of 255,000 gal/hr each.
Both south cooling towers were replaced in 2017 and have a capacity of 450,000 gal/hr each.
North and South cooling towers emission factors changed in light of new CT cells.

Stationary Reciprocating Internal Combustion Engines (RICE): EU#ICE: RICE

Process Description:
The plant has emergency diesel-fired fire water pump engines and emergency diesel-fired well pump engines, as listed in the table below.

Apparatus Number	Description	Fuel	Construction Date	Brake HP
131/5303	Fire Water Pump Engine (Jockey Pump)	Diesel	1997	296
131/5304	Fire Water Pump Engine (Jockey Pump)	Diesel	1997	296

Stationary Reciprocating Internal Combustion Engines (RICE): EU#ICE: RICE				
909/5303	#1 Well Emergency Pump Engine	Diesel	1966	75
909/5310	#3 Well Emergency Pump Engine	Diesel	1992	177

Applicable Regulation:
401 KAR 63:002, Section 2(4)(eeee), 40 C.F.R. 63.6580 through 63.6675, Tables 1a through 8, and Appendix A (Subpart ZZZZ), National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

Non-applicable Regulations:
401 KAR 60:005, Section 2(2)(dddd), 40 C.F.R. 60.4200 through 60.4219, Tables 1 through 8 (Subpart IIII), Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. The engines were constructed prior to July 11, 2005.

401 KAR 60:005, Section 2(2)(eeee), 40 C.F.R. 60.4230 through 60.4248, Tables 1 through 4 (Subpart JJJJ), Standards of Performance for Stationary Spark Ignition Internal Combustion Engines. These engines are not subject to the regulation since they are compression ignition engines, not spark ignition engines.

Comments:
The emission factors for the stationary reciprocating internal combustion engines are from AP-42, Chapter 3.

R&D Pilot Plant:
EU#RD: R&D Pilot Plant (324 Area) and Catalyst Testing Lab

Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
PM	2.34 lbs/hr	401 KAR 59:010, Section 3(2)	0.285 lb/hr – see Comments below for EF basis	Compliance is assumed because of the process rates of each affected facility (less than 2 lb/hr solids each)
Opacity	20%	401 KAR 59:010, Section 3(1)(a) and 401 KAR 63:015, Section 3	NA	Compliance is demonstrated by performing monthly visual observations and keeping records of the results of the observations.

Initial Construction Date: 2013

Process Description:
The R&D Pilot Plant is used for product research and development. The plant includes the following equipment:

- Reactors (capacities less than or equal to 100 gallons each)
- Distillation columns
- Feed tanks and receivers
- Steam and/or hot water heated dryers and tumblers
- Catalyst testing lab

R&D Pilot Plant:
EU#RD: R&D Pilot Plant (324 Area) and Catalyst Testing Lab

Applicable Regulation:
401 KAR 63:015, Flares.

401 KAR 63:020, Potentially hazardous matter or toxic substances.

Non-applicable Regulation:
401 KAR 60:005, Section 2(2)(bbb), 40 C.F.R. 60.480 through 60.489 (Subpart VV), Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After January 5, 1981, and on or Before November 7, 2006. This regulation does not apply because the equipment used in the pilot plant does not meet the definition of a process unit, pursuant to 40 CFR 60.480(f): components assembled to produce, as intermediate or final products, one or more of the chemicals listed in 40 CFR 60.489.

401 KAR 60:005, Section 2(2)(ppp), 40 C.F.R. 60.660 through 60.668 (Subpart NNN), Standards of Performance for Volatile Organic Compound (VOC) Emissions From Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations. Pursuant to 40 CFR 60.660(c)(3), this regulation does not apply because the distillation units at the pilot plant are designed and operated as batch operations.
401 KAR 60:005, Section 2(2)(ttt), 40 C.F.R. 60.700 through 60.708 (Subpart RRR), Standards of Performance for Volatile Organic Compound Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes. Pursuant to 40 CFR 60.700(c)(1), this regulation does not apply because the reactor processes in the R&D Pilot Plant are designed and operated as batch operations.

401 KAR 63:002, Section 2(4)(a), 40 C.F.R. 63.100 through 63.107, Tables 1 through 4 (Subpart F), National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry. 40 CFR 63.100(j)(1) exempts research and development facilities from the provisions of 40 CFR 63 Subparts F, G and H.

401 KAR 63:002, Section 2(4)(b), 40 C.F.R. 63.110 through 63.153, Tables 1 through 37, and Figure 1 (Subpart G), National Emission Standards for Organic Hazardous Air Pollutants From the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater. 40 CFR 63.100(j)(1) exempts research and development facilities from the provisions of 40 CFR 63 Subparts F, G and H.

401 KAR 63:002, Section 2(4)(c), 40 C.F.R. 63.160 through 63.183, Tables 1 through 4 (Subpart H), National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks. 40 CFR 63.100(j)(1) exempts research and development facilities from the provisions of 40 CFR 63 Subparts F, G and H.

401 KAR 63:002, Section 2(4)(lll), 40 C.F.R. 63.2430 through 63.2550, Tables 1 through 12 (Subpart FFFF), National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing. 40 CFR 63.2435(c)(1) exempts research and development facilities from the provisions of 40 CFR 63 Subpart FFFF.

Comments:
Emission Master software was used to determine emission factors for the R&D Plant.

SECTION 3 – EMISSIONS, LIMITATIONS AND BASIS (CONTINUED)

Testing Requirements\Results

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of last Compliance Testing
241, 242 (240 Building)	Thermal Oxidizer	Benzene (organic HAP) DRE	40 CFR 63, Subpart FFFF, Table 2	Initial	Method 18	≥ 98% DRE	99.9% DRE	406 dscfm; 1,377 lbs/hr inlet benzene emission rate	CMN20080002	4/30/2008
361 (236 Building)	Regenerative Thermal Oxidizer	Acetaldehyde (HAP organic) DRE	40 CFR 63, Subpart FFFF, Table 2	Initial	Method 18	≥ 98% DRE	98.7% DRE	1,156 dscfm; 2.45 lbs/hr inlet acetaldehyde emission rate	CMN20080002	5/1/2008
OAA (Riley Boiler)	Multi-cyclone, Baghouse	PM, NO_X	401 KAR 61:015 (PM); Preclude 401 KAR 51:017 (NO_X)	Initial	Method 5 (PM); Method 7e NO_X)	0.25 lb/mmBtu (PM); 122.8 lbs/hr (NO_X)	0.014 lb/mmBtu (PM); 80.57 lb/hr (NO_X)	123.62 mmBtu/hr	CMN20090005	11/17/2009, 11/18/2009
006 (200 Bldg Powder Packaging)	Rotoclone	PM	401 KAR 59:010	Initial	N/A (mass balance)	2.61 lbs/hr	0.03 lb/hr	2,713 lbs/hr	CMN20170003	7/6/2017
RX 315/3303 vent;Drumming receiver 315/3308	None	Ethylene Oxide	'not in ethylene oxide service'	Initial	EPA Method 320	N/A	TBD	TBD	CMN20240004	9/18/24

SECTION 4 – SOURCE INFORMATION AND REQUIREMENTS

Table A - Group Requirements:

Emission and Operating Limit	Regulation	Emission Unit
Less than 36 tpy VOC	Preclude 401 KAR 51:017	VP1 (02), VP1 (03), HVE 261 (02) and 261 (03)

Table B - Summary of Applicable Regulations:

Applicable Regulation	Emission Unit
401 KAR 50:012, General application	EU BL1, BL2, PY1, PY2
401 KAR 59:005, General provisions	EU 341, 362, 364, 002, 003, 0AC, 0AD, WPH, 0AE, 0AF, 0AG, 0AH
401 KAR 59:010, New process operations	EU 362, 364, 002, 003, 341, CT1
401 KAR 59:015, New indirect heat exchangers	EU 0AC, 0AD, WPH, 0AE, 0AF, 0AG, 0AH
401 KAR 61:020, Existing process operations	EU 362
401 KAR 63:015, Flares	EU VP1, 261, RD
401 KAR 63:020, Potentially hazardous matter or toxic substances	EU RD
401 KAR 57:002, Section 2, 40 C.F.R. 61 (Subpart FF), National Emission Standard for Benzene Waste Operations	EU 240, 241, 242
401 KAR 57:002, Section 2, 40 C.F.R. 61 (Subpart J), National Emission Standard for Equipment Leaks (Fugitive Emission Sources) of Benzene.	EU 240
401 KAR 57:002, Section 2, 40 C.F.R. 61 (Subpart V), National Emission Standard for Equipment Leaks (Fugitive Emission Sources)	EU 240
401 KAR 57:002, Section 2, 40 C.F.R. 61 (Subpart Y), National Emission Standard for Benzene Emissions from Benzene Storage Vessels	EU 242
401 KAR 60:005, Section 2(2)(d), 40 C.F.R. 60.40c through 60.48c (Subpart Dc), Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units	EU 0AC, 0AD, WPH, 0AE, 0AF, 0AG, 0AH
401 KAR 63:002, Section 2(4)(iiii), 40 C.F.R. 63.7480 through 63.7575, Tables 1 through 13 (Subpart DDDDD), National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters	EU 0AC, 0AD, WPH, 0AE, 0AF, 0AG, 0AH
401 KAR 63:002, Section 2(4)(a) 40 C.F.R. 63.100 through 63.107, Tables 1 through 4 (Subpart F) National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry	EU BL1, BL2, VP1, VP2, LVP, SR1, SR2
401 KAR 63:002, Section 2(4)(lll), 40 C.F.R. 63.2430 through 63.2550, Tables 1 through 12 (Subpart FFFF), National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing.	EU VE1, VE2, VE3, WW1, 240, 241, 242, 361, 36F, 151, 153, 001, 261, AF1, AF2

Applicable Regulation	Emission Unit
401 KAR 63:002, Section 2(4)(eeee), 40 C.F.R. 63.6580 through 63.6675, Tables 1a through 8, and Appendix A (Subpart ZZZZ), National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines	EU ICE
40 CFR Part 64, Compliance Assurance Monitoring (CAM)	EU 003

Table C - Summary of Precluded Regulations:

Precluded Regulation	Emission Unit
401 KAR 51:017, Prevention of significant deterioration	EU VP1, 261, VE1, 361

Table D - Summary of Non Applicable Regulations:

Non-Application Regulation	Emission Unit
401 KAR 50:012, General application	EU VP1, VP2
401 KAR 60:005, Section 2(2)(c), 40 C.F.R. 60.40b through 60.49b (Subpart Db), Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units	EU 0AE
401 KAR 60:005, Section 2(2)(bbb), 40 C.F.R. 60.480 through 60.489 (Subpart VV), Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After January 5, 1981, and on or Before November 7, 2006	EU BL1, BL2, PY1, PY2, VP1, VP2, SR1, SR2, VE1, VE2, VE3, 240, 241, 242, 245, 361, 362, 363, 364, 365, 366, 36F, 151, 152, 153, 001, 002, 003, 004, 005, 006, 341, 261, 262, RD
401 KAR 60:005, Section 2(2)(ppp), 40 C.F.R. 60.660 through 60.668 (Subpart NNN), Standards of Performance for Volatile Organic Compound (VOC) Emissions From Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations	EU BL1, BL2, PY1, PY2, VP1, VP2, SR1, SR2, VE1, VE2, VE3, 151, 152, 153, RD
401 KAR 60:005, Section 2(2)(ttt), 40 C.F.R. 60.700 through 60.708 (Subpart RRR), Standards of Performance for Volatile Organic Compound Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes	EU BL1, BL2, PY1, PY2, VP1, VP2, VE1, VE2, VE3, 240, 241, 242, 245, 361, 362, 363, 364, 365, 366, 36F, 151, 152, 153, 001, 002, 003, 004, 005, 341, 261, 262, RD
401 KAR 60:005, Section 2(2)(dddd), 40 C.F.R. 60.4200 through 60.4219, Tables 1 through 8 (Subpart IIII), Standards of Performance for Stationary Compression Ignition Internal Combustion Engines	EU ICE

Non-Application Regulation	Emission Unit
401 KAR 60:005, Section 2(2)(eeee), 40 C.F.R. 60.4230 through 60.4248, Tables 1 through 4 (Subpart JJJJ), Standards of Performance for Stationary Spark Ignition Internal Combustion Engines	EU ICE
401 KAR 63:002, Section 2(4)(a), 40 C.F.R. 63.100 through 63.107, Tables 1 through 4 (Subpart F), National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry	EU PY1, PY2, VE1, VE2, VE3, 240, 241, 242, 245, 361, 362, 363, 364, 365, 366, 36F, 151, 152, 153, 001, 002, 003, 004, 005, 006, 341, 261, 262, RD
401 KAR 63:002, Section 2(4)(b), 40 C.F.R. 63.110 through 63.153, Tables 1 through 37, and Figure 1 (Subpart G), National Emission Standards for Organic Hazardous Air Pollutants From the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater	EU BL1, BL2, PY1, PY2, VP1, VP2, SR1, SR2, VE1, VE2, VE3, 240, 241, 242, 245, 361, 362, 363, 364, 365, 366, 36F, 151, 152, 153, 001, 002, 003, 004, 005, 006, 341, 261, 262, RD
401 KAR 63:002, Section 2(4)(c), 40 C.F.R. 63.160 through 63.183, Tables 1 through 4 (Subpart H), National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks	EU BL1, BL2, PY1, PY2, VP1, VP2, SR1, SR2, VE1, VE2, VE3, 240, 241, 242, 245, 361, 362, 363, 364, 365, 366, 36F, 151, 152, 153, 001, 002, 003, 004, 005, 006, 341, 261, 262, RD
401 KAR 63:002, Section 2(4)(lll), 40 C.F.R. 63.2430 through 63.2550, Tables 1 through 12 (Subpart FFFF), National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing	EU BL1, BL2, PY1, PY2, VP1, VP2, SR1, SR2, 245, 362, 363, 364, 365, 366, 152, 002, 003, 004, 005, 006, 341, 262, RD
401 KAR 63:002, Section 2(4)(j), 40 C.F.R. 63.400 through 63.407, Table 1 (Subpart Q), National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers	EU CT1

Air Toxic Analysis

401 KAR 63:020, *Potentially Hazardous Matter or Toxic Substances*

The Division for Air Quality (Division) has performed AERMOD on May 17, 2018 of potentially hazardous matter or toxic substances from the R&D Pilot Plant that may be emitted based upon the process rates, material formulations, stack heights and other pertinent information provided by the applicant. Based upon this information, the Division has determined that the conditions outlined in this permit will assure compliance with the requirements of 401 KAR 63:020.

Single Source Determination

N/A

SECTION 5 – PERMITTING HISTORY

Permit	Permit Type	Activity#	Complete Date	Issuance Date	Summary of Action	PSD/Syn Minor
V-06-052	Renewal	APE20060003	5/2/2007	12/21/2007	Permit Renewal	Synthetic Minor
V-06-052 R1	Significant Revision	APE20080001	3/28/2008	12/23/2008	Incorporation of MON Requirements	
V06-052 R2	Minor Revision	APE20080002	8/28/2008	3/25/2009	Minor Revision – VP and HVE acetylene feed system venting	Synthetic Minor
V-06-052 R3	Minor Revision	APE20090003	6/2/2009	8/29/2009	Addition of Holman Boiler (OAE)	
V-06-052 R4	Minor Revision	APE20100005	9/20/2010	1/24/2011	Vinyl Ethers Unit Methanol Purge System installation	
V-12-039	Renewal	APE20120002	9/17/2012	7/16/2013	Permit Renewal	Synthetic Minor
	Significant Revision	APE20130002	3/22/2013	7/16/2013	Addition of 3 Natural Gas Boilers	
V-12-039 R1	Minor Revision	APE20150003	8/10/2015	12/7/2015	Vinyl Ethers Unit, Steam Stripper Modification	
V-12-039 R2	Minor Revision	APE20160002	6/1/2016	8/26/2016	Addition of Powder Packaging System to 200 Building	
V-18-036	Renewal	APE20180001	6/4/2018	11/18/2018	Renewal Permit	Synthetic Minor
V-18-036 R1	Minor Revision	APE20190002	4/25/2019	10/6/2019	Alternate Operating Scenario for Storage Tank 313/3004	
V-18-036 R2	Minor Revision	APE20190004	9/27/2019	1/3/2021	Addition of LVP Unit	
		APE20200001	5/11/2020		Replacement of EU002 Baghouse with Venturi Scrubber	

SECTION 6 – PERMIT APPLICATION HISTORY

N/A

APPENDIX A – FREQUENTLY USED ABBREVIATIONS AND ACRONYMS

AAQS – Ambient Air Quality Standards
BACT – Best Available Control Technology
Btu – British thermal unit
CAA – Clean Air Act
CAM – Compliance Assurance Monitoring
CO – Carbon Monoxide
Division – Kentucky Division for Air Quality
ESP – Electrostatic Precipitator
GHG – Greenhouse Gas
HAP – Hazardous Air Pollutant
HF – Hydrogen Fluoride (Gaseous)
MCPU – Miscellaneous Organic Chemical Manufacturing Process Unit
MSDS – Material Safety Data Sheets
mmHg – Millimeter of mercury column height
NAAQS – National Ambient Air Quality Standards
NESHAP – National Emissions Standards for Hazardous Air Pollutants
NO_x – Nitrogen Oxides
PM – Particulate Matter
PM_{10} – Particulate Matter equal to or smaller than 10 micrometers
$PM_{2.5}$ – Particulate Matter equal to or smaller than 2.5 micrometers
PSD – Prevention of Significant Deterioration
PTE – Potential to Emit
SO_2 – Sulfur Dioxide
TF – Total Fluoride (Particulate & Gaseous)
VOC – Volatile Organic Compounds