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MEMORANDUM

To: Beverly McKeone, NSR Program Manager

From: Mike Egnor, Engineer

Date: November 12, 2015

Subject: Class I Administrative Update R13-0181D for Chemours Washington Works

On October 16, 2015, Chemours Washington Works submitted an application for a Class I administrative update, R13-0181D, to remove and transfer equipment (see 1) below. The facility also has eliminated using methanol as solvent used in the process, elimination of ethylene glycol brine, and taking various tanks out of service reducing the potential emissions.

Process Description:

General Overview

The Acrylic Resins process has two production lines, Line #1 and Line #2. The main raw materials for this polymerization process are acrylic monomers, acrylates and methacrylates received in truck wagons, railcars, 55-gallon drums, or small volumes. Other miscellaneous raw materials (water, initiators, chain transfer agents, additives) are received by direct piping connection, in totes, bags, or lever-packs.

Pumps or transfer by pressure differential is used to move raw materials, semi-finished, and finished product through the process. Bulk monomers are stored in tanks filled by transfer pumps. These monomers are then either directly pumped into a batch weight-up tank or transferred into indoor storage tanks. For each polymerization batch a charge of monomers and additives are weighed up in a charge tank. The aqueous charge for each batch is weighed up in a separate vessel. Both the monomer and aqueous charges are then pressure transferred to the desired reaction vessel, referred to as a polykettle, through a common drop line.

Once the charge of raw materials has been successfully transferred to the desired polykettle, heat is applied to start the reaction. The suspension polymerization quickly occurs forming a water-polymer slurry.

Once cooled, the batch of slurry is transferred to a slurry handling system. Bulk water removal is then completed using a centrifuge. The polymer cake is transferred to a hot air drying system to remove the remaining water. The final screened product is then transferred to packaging lines.

Chemical Reaction

This process employs free radical suspension polymerization. Free radical polymerization is a method of polymerization by which a polymer forms by the successive addition of free radical building blocks. Free radicals can be formed via a number of different mechanisms usually involving separate initiator molecules. Following its generation, the initiating free radical adds (nonradical) monomer units, thereby growing the polymer chain. Suspension means that the reaction occurs in droplets of monomer suspended in a fluid which in this case is water.

Initiation is the first step of the polymerization process. During initiation, an active center is created from which a polymer chain is generated. Initiation has two steps. In the first step, one or two radicals are created from the initiating molecules. In the second step, radicals are transferred from the initiator molecules to the monomer units present. The initiator is heated until a bond is homolytically cleaved, producing two radicals.

During polymerization the polymer chain grows and propagates releasing heat of reaction until either the monomer source is consumed or until the polymer chain is terminated.

Changes Made to R13-0181C:

On October 24, 2005, WVDEP issued to DuPont Washington Works a permit R13-0181C for the Acrylics (A1) operating area. This permit was issued to allow DuPont to implement improvements to reduce emissions.

Since that time DuPont has announced plans to separate various businesses forming a new company called Chemours. For the remainder of this application the owner shall be referred to as Chemours.

The Acrylics operating area has implemented several additional improvements reducing emissions since the last R13 permit update. The improvements include elimination of methanol as solvent used in the process, elimination of ethylene glycol brine, and taking various tanks out of service reducing the potential emissions.

We are also reflecting change submitted on a Permit Determination (PD15-061) concerning the splitting of the current laboratory from a single hood to two hoods to provide better work access for personnel. We are requesting the limit be title A LabHoods which would be comprised of sources A471S and A472S emitting repetitively from A471E and A472E.

Under 45 CSR 13, Section 4.2.a.8., changes in permit conditions may be made as necessary to allow changes in operating parameters, emission points, control equipment or any other aspect of a source which results in a decrease in the emission of any existing regulated air pollutant or any new regulated air pollutant. According to section 4.2.a., such a change would be a Class I administrative update.

Chemours therefore requests that the agency address the associated requirements within the permits for A1 Area as follows:

1) **Changes to the Emission Units Table in Section 1.0.** The Emission Units Table has been updated to remove/revise the following Emission Sources from R13-0181D:

Emission Unit ID	Emission Point ID	Emission Source Description	Year Installed	Design Capacity	Control Device
~~A010.2S~~	~~A010E~~	~~1B Storage Tank~~	--	--	~~A010C~~
~~A050S~~	~~A050E~~	~~3S Storage Tank~~	--	--	~~NA~~
~~A080.2S~~ A040.1S	~~A080E~~ A040.1E	4E Storage Tank	--	--	NA
~~A105S~~	~~NA~~	~~8 Storage Tank~~	--	--	~~Closed System~~
~~A120S~~	~~A120E~~	~~#1 Indoor Storage Tank~~	--	--	~~NA~~
~~A130.1S~~ A110.1S	~~A130E~~ ~~A140E~~ A110E	#5 Indoor Storage Tank	--	--	NA
~~A130.4S~~	~~A130E~~ ~~A140E~~	~~#3 Indoor Storage Tank~~	--	--	~~NA~~
~~A130.5S~~	~~A130E~~ ~~A140E~~	~~DDM Indoor Storage Tank~~	--	--	~~NA~~
A130.6S	~~A130E~~ ~~A140E~~ A130.6E	~~Ingredient 8 Storage Tank~~ DDM Indoor Storage Tank	--	--	NA
A180S	A180E	~~Catalyst~~ Initiator Mix Tank	--	--	~~N/A~~ A180C
~~A190S~~	~~A190E~~	~~Catalyst Run Tank~~	--	--	~~NA~~
A191S	A190E	Initiator Run Tank	--	--	NA
~~A200S~~	~~A200E~~	~~Ingredient 11 Run Tank~~	--	--	~~NA~~
A220S	A130E A140E	Ingredient 12 ~~System~~ Run Tank	--	--	NA
A220.1S	A200E	Ingredient 12 Hold Tank	--	--	NA
A220.2S	A200E	Ingredient 12 Mix Tank	--	--	NA
A260.1S	~~NA~~ A200E	Ingredient 22 ~~System~~ Hold Tank	--	--	NA
A260.2S	A200E	Ingredient 22 Storage Tank	--	--	NA
~~A270S~~	~~A270E~~	~~Brine Tank~~	--	--	~~NA~~
~~A290.3S~~	~~A290E~~	~~Alternate Liquids Microscale Tank~~	--	--	~~NA~~
A340S	A340E	#1 Centrifuge	--	--	~~V~~ NA
A350.2S	A350E	#1 Predryer Cyclone	--	--	A350.1C
A390.6S	~~A390.6S~~ NA	Manual Bagger	--	--	A390.6C
~~A470S~~	~~A470E~~	~~Acrylics Lab~~	--	--	~~NA~~
~~A480S~~	~~A480E~~	~~S. PK Room Lab Hood~~	--	--	~~NA~~

A LabHoods A471S/A472S	A LabHoods A471E/A472E	A LabHoods	--	--	NA

2) Changes in Table 4.1.2 Insignificant Sources and Activities.

Table 4.1.2. Insignificant Sources and Activities

Emission Unit ID	Emission Point ID
A130.6S	~~A130E & A140E~~ A130.6E
A180S	A180E
A191S	A190E
~~A200S~~	~~A200E~~
~~A270S~~	~~A270E~~
~~A470S~~	~~A470E~~
~~A480S~~	~~A480E~~
A LabHoods (A471S/A472S)	A471E/A472E

3) Changes in Condition 4.1.1 Emission Limits:

A040.1E	VOC	1.7	0.04
A080E	VOC Methyl Methacrylate	4.2 4.16	~~1.41~~ 1.19 ~~1.408~~ 1.188
~~A120E~~	~~VOC~~ ~~Ethyl Acrylate~~	~~1.9~~ ~~1.83~~	~~0.021~~ ~~0.021~~
A160E	PM_{10}	1.3	~~0.10~~ 0.09
~~A180E~~	~~VOC~~ ~~Methanol~~	~~2.2~~ ~~2.13~~	~~0.103~~ ~~0.103~~
~~A190E~~	~~VOC~~ ~~Methanol~~	~~4.6~~ ~~4.56~~	~~0.09~~ ~~0.09~~
A310E	VOC Acrylic Acid Ethyl Acrylate ~~Methanol~~ Methyl Methacrylate	~~0.30~~ 0.24 0.01 0.03 ~~0.06~~ 0.18	~~0.720~~ 0.587 0.001 0.060 ~~0.133~~ 0.441
A320E	VOC Acrylic Acid Ethyl Acrylate ~~Methanol~~ Methyl Methacrylate	~~0.20~~ 0.17 0.01 0.02 ~~0.03~~ 0.09	~~0.360~~ 0.29 0.001 0.030 ~~0.070~~ 0.221

A350E	PM_{10} VOC Acrylic Acid Ethyl Acrylate ~~Methanol~~ Methyl Methacrylate	1.8 0.1 0.01 0.01 ~~0.02~~ 0.02	4.36 0.13 0.001 0.024 ~~0.051~~ 0.042
A390.1E	PM_{10} VOC Acrylic Acid Ethyl Acrylate ~~Methanol~~ Methyl Methacrylate	1.1 0.1 0.01 0.01 ~~0.01~~ 0.01	3.84 0.09 0.001 0.016 ~~0.033~~ 0.027
A390.2E	PM_{10} VOC Acrylic Acid Ethyl Acrylate ~~Methanol~~ Methyl Methacrylate	1.1 0.1 0.01 0.01 ~~0.01~~ 0.01	3.84 0.09 0.001 0.016 ~~0.033~~ 0.027
A450E	VOC Acrylic Acid Ethyl Acrylate ~~Methanol~~ Methyl Methacrylate	0.3 0.01 0.03 ~~0.06~~ 0.18	0.72 0.001 0.060 ~~0.133~~ 0.441
~~A470E~~	~~Methylene Chloride~~	~~0.01~~	~~0.001~~
A LabHoods A471E/A472E	Methylene Chloride Toluene Methanol	0.01 0.01 0.01	0.001 0.001 0.001

4) Changes in Condition 4.2.1 Emission Limits:

The phrase "Monitoring shall be conducted at least once per month with a maximum of forty-five (45) days between consecutive readings." has been revised to "Monitoring shall be conducted at least once per month. This change has been made to provide consistency with the majority of other units with the same monitoring requirements at this facility that have this language.

5) Changes in Attachment A – Monthly Production & Throughput Report

The following changes have been made to the Storage Tanks table in Attachment A:

Storage Tanks

Equipment ID	Material Stored	Max Fill Rate (gpm)	Monthly Throughput (gal)	12 Month Total Throughput (gal)	12 Month Total Emissions[2]		
					Breathing	Working	Total
~~A010.2S~~	~~EA~~						
~~A050S~~	~~MeOH~~						
~~A080.2S~~	~~MMA~~						
~~A120S~~	~~EA~~						
~~A130.5S~~	~~VOC~~						
A130.6S	VOC						
~~A180S~~	~~MeOH~~						
~~A190S~~	~~MeOH~~						

6) Changes in Attachment A Storage Tanks and Process Equipment Tables VOC & HAP and PM10:

The following changes have been made to Attachment B:

Storage Tanks

Emission Point ID	Equipment ID	Control Device ID	VOC		EA		MMA		MeOH	
			Max. pph	ppy[2]	Max. pph	ppy[2]	Max. pph	ppy[2]	Max. pph	ppy[2]
A010E	A010.1S ~~& .2S~~	A010C								
A040.1E	A040.1S	NA								
A080E	A080.1S ~~& .2S~~	NA								
A130E	~~A130.1 - .5S~~ A130.2S, .3S, 6S	NA								
A140E	~~A130.1 - .5S~~ A130.2S, .3S, 6S	NA								
~~A180E~~	~~A180S~~	~~NA~~								
~~A190E~~	~~A190S~~	~~NA~~								

Process Equipment – VOC & HAP

Emission Point ID	Equipment ID	Control Device ID	VOC		AA		EA		MMA		MeOH	
			Max. pph	ppy[2]	Max. pph	ppy[2]	Max. pph	ppy[2]	Max. pph	ppy[2]	Max. pph	ppy[2]
A390.1E	A390.1S A390.2S A390.3S	A390.1C										
A390.2E	A390.1S A390.2S A390.3S	A390.2C										

Process Equipment – PM_{10}

Emission Point ID	Equipment ID	Control Device ID	PM_{10}	
			Max. pph	ppy[2]
A390.1E	A3901S, A390.2S, A390.3S, ~~A390.5S~~	A390.1C		
A390.2E	A3901S, A390.2S, A390.3S, ~~A390.5S~~	A390.2C		
~~A390.6E~~	~~A390.6S~~	~~A390.6C~~		

Emissions

This modification will result in a decrease of 0.381 TPY of VOC and 1.155 TPY of Total HAP's.

The changes requested in this permit application are a transfer of requirements in NSR Permits and meet the definition of a Class I Administrative Update according to the definition provided in 45CSR13-4.2.a.

Recommendation:

The writer recommends that Class I Administrative Update Permit R13-0181D be granted to Chemours, Washington Works facility located in Wood County, WV. Based on the information provided in the permit application, the applicant meets all applicable federal and state regulations pertaining to the requested change.

Mike Egnor
Permit Engineer

11/13/15

Date