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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: R13-2365G
Plant ID No.: 107-00182
Applicant: The Chemours Company FC, LLC
Facility Name: Washington Works
Location: Washington, Wood County
SIC Code: 2821, 2824, 2869
NAICS Code: 325211, 325222, 325110
Application Type: Class II Administrative Update
Received Date: May 12, 2015
Engineer Assigned: Mike Egnor
Fee Amount: \$300
Date Received: May 14, 2015
Complete Date: May 27, 2015
Due Date: July 26, 2015
Applicant Ad Date: May 18, 2015
Newspaper: *The Parkersburg News*
UTM's: Easting: 442.3767 km Northing: 4346.8331 km Zone: 17
Description: The following are associated with this Class II Administrative Update: (1) Change in Permittee name and Plant ID No.; (2) Revised emission calculations and additional VOC's from de-inventorying and re-inventorying; (3) Transferring an emissions source; and (4) Revised particulate matter monitoring.

There is an increase of trace amounts of Acetonitrile, Hydrofluoric Acid, and Particulate Matter, 0.01 pph and tpy for Carbon Monoxide, and 6.16 pph and 1.02 tpy VOC emissions associated with this Class II administrative update.

DESCRIPTION OF PROCESS

PFA is a copolymer of various monomers produced in a semi-batch polymerization process. The reaction requires a pre-charge of water, ethane, aqueous fluorosurfactants, water-soluble initiator salts and the monomers. During polymerization, the monomers and

some make-up initiator are continually added to the reactor. The system is also designed to produce a low molecular weight Poly-TFE product, which is similar to PFA.

At batch end, un-reacted monomers will be vented down to 5 psig to the Thermal Converter (T7IMC) covered by permit 1823. When the Thermal converter is not operational, the unreacted monomers will be vented to Monomer's internal recovery device (T1GN). From 5 psig to a slight vacuum, the reactor will be vented to the atmosphere. See emissions summary sheet for vented amounts.

The aqueous emulsion produced in the reactor is transferred to the Isolation facility for further processing and then transferred to the Finishing system. Some of the aqueous surfactant added during polymerization is driven off in the drying step, and recovered by C1FSC2 and C1FSC3.

The dried polymer is pneumatically conveyed to various vessels, compacted, and then extruded to produce small pellets or cubes. A small amount of dry polymer bypasses the extruder and is packed out as fluff.

The cubes are blended in downstream facilities, and then either packed out for sale to customers, or transferred to the fluorination facilities. Material sent to the fluorination facilities is transferred into a reactor where the polymer end groups react with a fluorine/nitrogen mixture to produce a more stable product. The un-reacted fluorine and reaction byproducts are vented to C1FEC. The cubes are then cooled, sampled, and packed out for sale to customers.

The changes submitted in this Class II Administrative update R13-2365G include:

1. Revised emissions calculations to reinstate emissions from the ingredient feed system (C1FW) through the reactor (C1FQ) to emission point (C1FQE), which were inadvertently removed in the application filed for R13-2365E. This includes increasing the hourly VOC emission rate for C1FQE from 21.00 to 21.76 tons per year.
2. Revised emissions calculations to reinstate emissions from the ingredient feed system (C1FW) to emission point C1FWE, which were inadvertently removed in the application filed for R13-2365E. This includes increasing the hourly VOC emission rate from 26.55 pph to 32.2 pph, and from 0.29 tons per year VOCs to 0.35 tons per year.
3. Revised calculations to include acetonitrile being emitted in <0.01 lbs/hr and <0.01 tons/year from source C1FW to emission point C1FWE.
4. Revised calculations for C1GX (ingredient system charge pot) to account for emissions that occur while inventorying the charge pot, increasing total VOC emissions from emission point C1GXE from 0.29 to 0.31 tons/year.
5. Added C2EQ (an oven) from area C2 as source C1GZ, venting to a vacuum pump

(C1GZC), then to emission point C1GZE. The atmospheric emissions from the oven are 0.51 lbs/hr and 0.18 tons/year VOCs, hydrofluoric acid emissions are expected to be trace, as are PM emissions; CO emissions are estimated to be 0.01 lbs/hr and 0.01 tons/year.

6. Changed the name of the Permittee from "E.I. DuPont de Nemours and Company, Inc." to "The Chemours Company FC, LLC" and Plant ID No: from "107-00001" to "107-00182".

SITE INSPECTION

Chemours Washington Works facility is well known by the WV DAQ. The Fluoropolymers area of the plant had their last on site inspection conducted on August 28, 2012. At the time of the inspection, the Fluoropolymers area was found to be in compliance. No site inspection is required for this Class II Administrative Update permit application.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The revised calculations result in an increase in permitted VOC emissions from emission point C1FWE from 26.54 pph to 32.2 pph, an increase of 5.66 pph; this will cause an increase in the annual VOC emissions from C1FWE: 0.29 tpy to 0.35 tpy. The same review necessitates an inclusion of acetonitrile emissions in the amounts of <0.01 pph and <0.01 tpy being emitted from the same emission point. These emissions were originally included in the permit and were inadvertently removed when source C1GY was removed. The emissions are from source C1FW – Ingredient feed system, with respect to cylinder change-outs.

Also associated with source C1GY were emissions from de-inventorying and re-inventorying the ingredient feed system (C1FW); these also were inadvertently removed. As a result, we seek to add back into the permit 600 lbs/year of VOC emissions from re-inventorying the feed system, and 915 lbs/year of VOC emissions from de-inventorying the feed system. Therefore, we seek to increase the current limit of VOC emission from C1FQE by 0.76 tons (21.00 tpy to 21.76 tpy).

Air pollutant emission calculations for C1GX (ingredient system charge pot) were also revised to account for emissions that occur while inventorying the charge pot, increasing total VOC emissions from emission point C1GXE from 0.29 to 0.31 tons/year.

Source C2EQ (an oven) from area C2 is being transferred to area C1, with no physical moves or changes, as source C1GZ. C1GZ vents to a scrubber with a vacuum pump (C1GZC), then to emission point C1GZE. The atmospheric emissions from the oven are 0.51 lbs/hr and 0.18 tons/year VOCs, hydrofluoric acid emissions are expected to be trace, as are PM emissions; CO emissions are estimated to be 0.01 lbs/hr and 0.01 tons/year.

Emission calculations are based on one of the following engineering estimates: (1) the ideal gas law to determine pounds emitted per event and number of events to determine annual emissions; (2) for non-ideal situations, equation of state to determine

mole fractions to determine pounds per event and number of events used to determine annual emissions; (3) air measurements to determine pounds per event then multiplied by the number of events to get annual emissions; and (4) polymer rate multiplied by emissions per pound of polymer. The polymer rate may have a surrogate such as motor amps, screw speed, etc. for hourly emission or number of batches for annual emissions. The emissions per pound of polymer are either engineering estimates, determined by off gas analysis, scaling up from a pilot plant, or simple stack measurements.

The maximum potential emissions were determined using the engineering calculation software TK Solver. The writer verified the output from the modeling program against the emissions provided in the emissions table below.

Emissions Summary Table:

Emission Point ID	Emission Unit ID	Emission Description	Control Device	Regulated Pollutant	Maximum Potential Emissions	
					lbs/hr	tpy
C1FWE	C1FW	(ingredient feed system)	N/A	VOC	32.2	0.35
				Acetonitrile	< 0.01	< 0.01
C1FQE	C1FQ C1GH	(reactor) (ingredient feed system)	N/A	VOC	38.54	21.76
				ODC	0.93	0.05
				Acetonitrile	0.01	0.01
C1GXE	C1GX	(ingredient system charge pot)	N/A	VOC	1.89	0.31
C1GZE	C1GZ	(oven)	C1GZC (scrubber with a vacuum pump)	VOC	0.51	0.18
				Hydrofluoric Acid	< 0.01	< 0.01
				PM	< 0.01	< 0.01
				CO	0.01	0.01

The change in total permitted emissions on an annual basis as a result of this application are provided in the table below:

Emissions Change Table:

Emission Point ID	Emission Unit ID	Regulated Pollutant	Current Emission Limits		R13-2365G Proposed Emission Limits		Change in R13-2365G permitted emissions	
			lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy
C1FWE	C1FW	VOC	26.55	0.29	32.2	0.35	5.65	0.06
		Acetonitrile	0	0	< 0.01	< 0.01	< 0.01	< 0.01
C1FQE	C1FQ C1GH	VOC	38.54	21.00	38.54	21.76	0	0.76
		ODC	0.93	0.05	0.93	0.05	0	0
		Acetonitrile	0.01	0.01	0.01	0.01	0	0
C1GXE	C1GX	VOC	1.89	0.29	1.89	0.31	0	0.02
C1GZE	C1GZ	VOC	0	0	0.51	0.18	0.51	0.18
		Hydrofluoric Acid	0	0	< 0.01	< 0.01	< 0.01	< 0.01
		PM	0	0	< 0.01	< 0.01	< 0.01	< 0.01
		CO	0	0	0.01	0.01	0.01	0.01

Total Emissions Change Table:

Regulated Pollutant	Current Emission Limits	
	lbs/hr	tpy
VOC	6.16	1.02
Hydrofluoric Acid	< 0.01	< 0.01
PM	< 0.01	< 0.01
Acetonitrile	< 0.01	< 0.01
CO	0.01	0.01

REGULATORY APPLICABILITY

45CSR13 PERMITS FOR CONSTRUCTION, MODIFICATION, RELOCATION AND OPERATION OF STATIONARY SOURCES OF AIR POLLUTANTS, NOTIFICATION REQUIREMENTS, ADMINISTRATIVE UPDATES, TEMPORARY PERMITS, GENERAL PERMITS, PERMISSION TO COMMENCE CONSTRUCTION, AND PROCEDURES FOR EVALUATION

The changes proposed in this application meet the definition of a Class II Administrative Update according to 45CSR §13-4.2.b.1. The increase in emissions is less than 6 lbs/hr and 10 tpy of any regulated air pollutant, is less than 144 ppd of any regulated pollutant, and is less than 2 lbs/hr or 5 tpy of

hazardous air pollutants considered on an aggregated basis.

The applicant has met the requirements of 45CSR13 by placing a Class I legal notice in *The Parkersburg News* on May 18, 2015, providing a complete permit application, and paying the required \$300 application fee.

45CSR14 PERMITS FOR CONSTRUCTION AND MAJOR MODIFICATION OF MAJOR STATIONARY SOURCES OF AIR POLLUTION FOR THE PREVENTION OF SIGNIFICANT DETERIORATION (PSD)

As of January 2, 2011, pursuant to actions taken by the USEPA, Greenhouse Gases (GHGs) became a regulated pollutant under the major NSR program. As such, an evaluation must be done for any increase in GHG emissions resulting from construction or modification to determine PSD applicability per 40 CFR 52.21. There are no new emissions of components listed in table A-1 of 40 CFR 92.2; therefore, PSD for GHG does not apply.

45CSR21 REGULATION TO PREVENT AND CONTROL AIR POLLUTION FROM THE EMISSION OF VOLATILE ORGANIC COMPOUNDS

45CSR21-40.3c requires RACT analysis on a case by case basis for those VOC emissions greater than 6 pph which are constructed, modified, or began operation after the date 45CSR21 became effective. Chemours' permit R13-3223 requires RACT analysis for any increase in VOC from sources listed in R13-3223.

Several sources will have new or increased VOC emissions. However none of these sources are listed in R13-2617 nor do any new sources exceed 6 pph VOCs, therefore a RACT analysis is not required.

45CSR30 REQUIREMENTS FOR OPERATING PERMITS

The C1 area operates under their Title V permit, R30-10700001- 2010, Part 2 of 14. The applicant submitted a joint application for a Class II Administrative Update of R13-2365E and a minor modification to the Title V permit.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

There are no new hazardous air pollutants associated with this application.

AIR QUALITY IMPACT ANALYSIS

The proposed changes in this Class II Administrative Update permit application do not meet the definition of a major modification according to the definitions in 45CSR14 and 45CSR19;

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therefore, modeling is not required for this permit application.

MONITORING OF OPERATIONS

Condition A.6 which requires monitoring for particulate matter "...at least once per month with a maximum of forty-five (45) days..." to "...at least once per month." This is to ensure consistency with particulate matter monitoring throughout the site.

CHANGES TO PERMIT R13-2365E

- General changes such as permit versions, dates, revisions, facility name, ID no., etc.
- Increased the hourly VOC emission rate for C1FQE from 21.00 to 21.76 tons per year.
- Increased the hourly VOC emission rate for C1FWE from 26.55 pph to 32.2 pph, and from 0.29 tons per year VOCs to 0.35 tons per year. Also included acetonitrile being emitted in <0.01 lbs/hr and <0.01 tons/year.
- Increased total VOC emissions from emission point C1GXE from 0.29 to 0.31 tons/year.
- Added C2EQ (an oven) from area C2 as source C1GZ, venting to a vacuum pump (C1GZC), then to emission point C1GZE. Emissions added to this source are 0.51 lbs/hr and 0.18 tons/year VOCs, < 0.01 pph and tpy for hydrofluoric acid and particulate matter emissions, and 0.01 pph and tpy for carbon monoxide.
- Changed the name of the Permittee from "E.I. DuPont de Nemours and Company, Inc." to "The Chemours Company FC, LLC" and Plant ID No: from "107-00001" to "107-00182".
- Changed the reference in Condition B.8 from "Consent Order CO-R21-97-47" to "R13-3223". Changed the reference from "Attachment D" to "R13-3223" and removed Attachment D from the Permit.
- Changed monitoring requirements in Condition A.6 to remove the phrase "with a maximum of forty-five days between consecutive readings".
- Added control device C1GZC Vacuum Pump to Table B.3.

RECOMMENDATION TO DIRECTOR

The writer recommends that the Class II Administrative Update Permit R13-2365G be granted to Chemours, Washington Works facility located in Wood County, WV. Based on

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the information provided in the permit application, the applicant meets all applicable federal and state air regulations pertaining to the requested change.



Mike Egnor
Engineer



Date