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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-0882J
Plant ID No.:	039-00663
Applicant:	Optima Belle LLC
Facility Name:	Belle
Location:	Belle, Kanawha County
NAICS Code:	325199
Application Type:	Class II Administrative Update
Received Date:	March 30, 2016
Engineer Assigned:	Mike Egnor
Fee Amount:	$300.00
Date Received:	February 24, 2016
Complete Date:	April 18, 2016
Due Date:	June 17, 2016
Applicant Ad Date:	April 4, 2016
Newspaper:	*The Charleston Gazette*
UTM's:	Easting: 451.90 km Northing: 4,232.60 km Zone: 17

Description: An alternative operating scenario (Sodium tetraphyenyl borate "STPB") is being added to this Permit. The emissions for this process are expected to be 3.36 lbs/hr and 180 lbs/yr of VOC's, 0.01 lbs/hr and 20 lbs/yr of benzene and chlorobenzene, 0.05 lbs/hr and 40 lbs/yr of methanol, 0.13 lbs/hr and 40 lbs/yr of toluene, 0.87 lbs/hr and 40 lbs/yr of hexane, and 0.13 lbs/hr and 60 lbs/yr of PM.

INTRODUCTION

On March 30, 2016 Optima Belle LLC submitted a Class II Administrative Update for the proposed revisions to process equipment located at the Belle Plant, currently covered under permit R13-0882I.

On April 15, 2016, Optima submitted an affidavit of publication indicating that the required legal notice was run in the Charleston Gazette on April 4, 2016, initiating the 30-day public notice period. Optima also submitted the application fee of $300 February 24, 2016 to meet the requirements associated with the Application for a Class II Administrative Update.

DESCRIPTION OF PROCESS

Sodum tetraphenyl borate "STPB" Overview:

Sodium tetraphenyl borate "STPB", a white powdered solid, is produced from reactions of mixtures which include: trimethyl borate, magnesium, chlorobenzene, tetrahydrofuran, toluene, THF, hexane, methanol, benzene, sulfuric acid, sodium chloride, sodium hydroxide, and water.

STPB is typically used to generate other tetraphenylborate salts or as a precipitating agent in other chemistries.

Process Summary:

Varying amounts of the listed components are charged to nitrogen-blanketed reactors, then agitated for mixing and heated. These mixtures are then combined and react to form the final product. Through decanting, stripping, and drying, the final product is isolated and purified from the reaction mixtures and solvents. Waste materials are loaded to totes and tanker trucks for off-site disposal.

The proposed production of STPB will be conducted within the existing permitted operating unit, currently permitted under R13-0882I except for a new tank (228) and two polish filters.. As a result, the changes associated with permit application R13-0882I will not result in any new emission points.

SITE INSPECTION

No site inspection was performed by the permitting engineer for this modification as the facility is well known to the DAQ and is frequently inspected by members of the DAQ Enforcement Section.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emission Point 104.014, which is the exit of the incinerator (009) and scrubber (010) is stated as 99.9% efficient of VOC's. The emissions for this process are expected to be 3.36 lbs/hr and 160 lbs/yr of VOC's, 0.01 lbs/hr and 20 lbs/hr of benzene and chlorobenzene, methanol, 0.87 lbs/hr and 40 lbs/yr of hexane, and 0.09 lbs/hr and 20 lbs/yr of toluene. The toluene emissions include the toluene tank uncontrolled emissions during storage only. For the dust collector 023 there is emissions of 0.06 lbs/hr and 20 lbs/yr of PM. During routine filter cleaning/changeout of the Polish Filter, there are fugitive emissions of 0.51 lbs/hr and 20 lbs/yr of VOC's, and 0.04 lbs/hr and 20 lbs/yr of Toluene and Methanol each. For the dust collector 114A there are emissions of 0.05 lbs/hr and 20 lbs/yr of PM. For Reactor #5 (219) magnesium is dumped into the open reactor by personnel. PM emissions are 0.02 lbs/hr and 20 lbs/yr.

Emissions Summary

The proposed changes addressed in permit application R13-0882J shall result in the affected emission points undergoing emissions as shown in the following Table 1 - Emissions Summary.

Table 1 - Emissions Summary

Emission Point ID	Device Type	Pollutant	Air Pollution Control Device ID	Maximum Potential Uncontrolled Emissions		Maximum Potential Controlled Emissions	
				lbs/hr	tons/yr	lbs/hr	lbs/yr
104.014	Incinerator Scrubber	VOC Benzene Chlorobenzene Hexane Methanol Toluene	009 010	24.71 0.02 0.01 17.62 0.04 4.49	3.50 0.01 0.01 2.71 0.01 0.55	2.85 0.01 0.01 0.87 0.01 0.09	160 20 20 40 20 20
107.022	Dust Collector	PM	023	0.06	0.01	0.06	20
104.003A	Dust Collector	PM	114	0.05	0.01	0.05	20
219	Reactor #5	PM	N/A	0.02	0.01	0.02	20
Fugitives	Polish Filter Cleaning/ Cleanout	VOC's Toluene Methanol	None None None	0.51 0.04 0.04	0.01 0.01 0.01	0.51 0.04 0.04	20 20 20

REGULATORY APPLICABILITY

The following State and Federal regulations were considered for applicability to the subject facility:

The following regulations apply to this production unit: West Virginia Regulations 7, 13, 21, 30 and US EPA MACT Standards for the Miscellaneous Organic NESHAP.

RULE 7 - PARTICULATE MATTER FROM MANUFACTURING SOURCES
The dumping of Magnesium into Reactor #5 (219) is a "Type a" Source Operation under Rule 7. The mass limits contained in 45CSR§7-4.1 would be 0.80 lbs/hr for Reactor #5 (219) (based on 664 lbs over 1 hour) Dust Collectors 023 and 114 are "Type d" Source Operations under Rule 7. The mass limits contained in 45CSR§7-4.1 would be 0.23 lbs/hr for dust collector 114 (40,265 lbs over 208 hours) and 0.08 lbs/hr for dust

collector 023 (14,593 lbs over 208 hours). The above limits are below these Rule 7 mass limits. The opacity requirements for these sources are already permitted under their Title V Permit.

RACT
45CSR21-40.3.c requires RACT analysis on a case by case basis for those VOC emissions greater than 6 pph which are constructed, modified, or begin operation after the date 45CSR 21 becomes effective. The proposed changes to R13-0882J do not include an increase of VOC's greater than 6 pph.

This class II permit amendment application is being filed under 45CSR13 since a change in batch production is being requested. Overall, VOC emissions will be 0.09 tons/year, HAP emission will be 0.08 tons/year and PM emissions associated with the sources identified in this application will be 0.03 tons/year.

TOXICITY OF CRITERIA REGULATED POLLUTANTS
Hexane has the following exposure limits:

ACGIH TLV
Inhalation 176 mg/m^3 TWA
Skin 50 ppm TWA
Skin 500 STEL: 1,000 ppm TLV
Inhalation 1760 STEL: 3,500 mg/m^3 TLV

NIOSH REL
50 ppm (180 mg/m^3) TWA

OSHA PEL
500 ppm TWA
Inhalation 1,800 mg/m^3 TWA

Chlorobenzene has the following exposure limits:
ACGIH TLV
10 ppm
46 mg/m^3 TWA

NIOSH REL
75 ppm TWA

OSHA PEL
10 ppm
46 mg/m^3

Toluene has the following exposure limits:
ACGIH TLV
50 ppm TWA

NIOSH REL
SKIN: 100 STEL: 150
375 STEL: 560 mg/m^3 TWA

OSHA PEL
200 STEL: 500 CEIL: 300 ppm TWA

Benzene has the following exposure limits:
ACGIH TLV
0.5 ppm TWA
1.6 mg/m^3 TWA
STEL: 2.5 ppm
STEL: 8 mg/m^3

NIOSH REL
0.1 ppm TWA
STEL: 1 ppm

OSHA PEL
1 ppm TWA
STEL: 5 ppm

Methanol has the following exposure limits:
ACGIH TLV
200 ppm TWA
STEL 250 ppm

NIOSH REL
200 ppm TWA
260 mg/m^3 TWA
6,000 ppm IDLH

OSHA PEL
200 ppm TWA
260 mg/m^3 TWA

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

Sodium Hydroxide has the following exposure limits:
ACGIH TLV
STEL: 2 mg/m^3

NIOSH REL
CEIL: 2 mg/m^3

OSHA PEL
2 CEIL: 2 mg/m^3 TWA

Sulfuric Acid has the following exposure limits:
ACGIH TLV
Inhalation 1 STEL: 3 mg/m^3 TWA

NIOSH REL
Inhalation 1 STEL: 3 mg/m^3 TWA

OSHA PEL
Inhalation 1 mg/m^3 TWA

Tetrahydrofuran (THF) has the following exposure limits:
ACGIH TLV
590 STEL: 737 mg/m^3 TWA
Inhalation: 200 STEL 250 ppm TWA
NIOSH REL
Inhalation: 735 STEL 250 ppm TWA

OSHA PEL
200 STEL 250 ppm TWA
Inhalation: 735 STEL 250 ppm TWA

MONITORING OF OPERATIONS

The Title V Permit provides monitoring requirements due to opacity readings. The facility is already required to monitor visible emissions (Condition 4.2.2), monitor their production (Condition 4.2.1), monitor the temperature of the incinerator (Condition 4.2.3), and monitor the pH and flow rate of the scrubber (Condition 4.2.4).

Changes to R13-0882J include:

1. Updated the Permit Number to R13-0882J.

2. Added two polish filters to the equipment table under Fugitive Emissions.

3. Added Condition 4.1.2.8.1 to require that the dust collector (114) be used when solids are charged to the reactor.

4. Added Condition 4.1.2.8.2 to require that the incinerator (009) be used at emission point 114.014 during all periods of Sodium Tetraphenyl Borate (STPB) production.

5. Added Condition 4.1.1.8.3 to require that Dust Collector (23) be used by emission point 107.022 when packaging solids to drums.

6. Added Condition 4.1.1.8.4 to require specific emissions limits for particulate matter, VOC's, and HAPs for STPB production.
7. Corrected the citation in Condition 4.1.2.1 to cite Section 4.1.2.1.1. through 4.1.2.1.4.

8. Updated the page numbers in the Table of Contents.

9. Added "R13-0882J" to Condition 2.5.1.

As a response to comments received by Optima on May 6, the following additional changes have been made.

10. The "BI Storage Tank" has been renamed "A Tank"

11. The Phosgene Cylinders (200) has been removed from the equipment table.

12. The Centrifuge Feed Tank (228) has been added to the equipment table.

13. Condition 2.4.1 has been changed from previously issued Permit R13-0882F to R13-0882I.

14. Reactor 8 (209) has been added to Table 4.1.2.8.4 for Emission Point ID 104.014.

15. The Polish Filter Cleaning/Cleanout has fugitive emissions for VOC's, Toluene, and Methanol. They were previously shown under Emission Point ID 107.022 in Table 4.1.2.8.4. They have been listed separately as fugitive emissions.

16. Added the following to Condition 4.1.2.8.2: "During STPB production runs when the process is not operating the uncontrolled storage of toluene in A Tank shall be limited to a four (4) weeks per year. The 4 week timeframe shall include all time that toluene is in the tank to prepare for a production run, between production runs when not in operation, and after production is complete." This language specified the astericks in Table 4.1.2.8.2 that shows uncontrolled Toluene emissions in the A Tank during storage only.

RECOMMENDATION TO DIRECTOR

Permit application, R13-0882J, submitted by Optima Belle, LLC, for the administrative permit update of the production facility located at the Belle Plant in Belle, Kanawha County, WV, has been reviewed and determined to meet all applicable requirements, and is therefore, recommended for approval.

Mike Egnor
Engineer

5/18/16
Date