

# Application Review

**Issue Date:** November 21, 2023

**Region:** Mooresville Regional Office  
**County:** Gaston  
**NC Facility ID:** 3600078  
**Inspector's Name:** Seth Hall  
**Date of Last Inspection:** 08/15/2023  
**Compliance Code:** 3 / Compliance - inspection

<p style="text-align: center;"><b>Facility Data</b></p> <p><b>Applicant (Facility's Name):</b> Livent USA Corp.</p> <p><b>Facility Address:</b>                  Livent USA Corp.                  1115 Bessemer City - Kings Mtn. Hwy.                  Bessemer City, NC 28016</p> <p><b>SIC:</b> 2819 / Industrial Inorganic Chemicals  <b>NAICS:</b> 325188 / All Other Basic Inorganic Chemical Manufacturing</p> <p><b>Facility Classification: Before:</b> Title V   <b>After:</b> Title V  <b>Fee Classification: Before:</b> Title V   <b>After:</b> Title V</p>	<p style="text-align: center;"><b>Permit Applicability (this application only)</b></p> <p><b>SIP:</b> N/A  <b>NSPS:</b> N/A  <b>NESHAP:</b> N/A  <b>PSD:</b> N/A  <b>PSD Avoidance:</b> N/A  <b>NC Toxics:</b> N/A  <b>112(r):</b> N/A  <b>Other:</b> N/A</p>
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Contact Data			Application Data
<p style="text-align: center;"><b>Facility Contact</b></p> Brad Braggs Env. and Sustainability Specialist (704) 868-5544 1115 Bessemer City - Kings Mtn. Hwy. Bessemer City, NC 28016	<p style="text-align: center;"><b>Authorized Contact</b></p> James Watts Plant Manager (704) 868-0833 1115 Bessemer City - Kings Mtn. Highway Bessemer City, NC 28016	<p style="text-align: center;"><b>Technical Contact</b></p> Brad Braggs Env. and Sustainability Specialist (704) 868-5544 1115 Bessemer City - Kings Mtn. Hwy. Bessemer City, NC 28016	<p><b>Application Number:</b> 3600078.23B &amp; 3600078.22A  <b>Date Received:</b> 09/07/2023 &amp; 11/01/22  <b>Application Type:</b> Modification  <b>Application Schedule:</b> TV-Sign-501(b)(2) Part II, TV-502(b)(10)</p> <p style="text-align: center;"><b>Existing Permit Data</b></p> <p><b>Existing Permit Number:</b> 03560/T53  <b>Existing Permit Issue Date:</b> 12/02/2021  <b>Existing Permit Expiration Date:</b> 02/28/2026</p>

<b>Total Actual emissions in TONS/YEAR:</b>							
CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2022	0.8900	16.30	6.68	18.04	14.43	2.24	1.37 [Chlorine]
2021	1.09	18.25	7.24	20.65	13.63	2.82	1.70 [Chlorine]
2020	1.08	17.07	6.42	19.67	13.51	2.64	1.70 [Chlorine]
2019	1.08	16.33	2.54	17.24	15.12	2.77	1.71 [Chlorine]
2018	1.02	15.88	2.63	16.76	13.74	2.66	1.60 [Chlorine]

<p><b>Review Engineer:</b> Connie Horne</p> <p><b>Review Engineer's Signature:</b> _____      <b>Date:</b> November 21, 2023</p>	<p style="text-align: center;"><b>Comments / Recommendations:</b></p> <p><b>Issue</b> 03560/T54  <b>Permit Issue Date:</b> DRAFT  <b>Permit Expiration Date:</b> February 28, 2026</p>
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## 1. Purpose of Applications

- **Application 3600078.23B**

This permit action, received September 7, 2023, is for Part II of a two-step process allowed under 15A NCAC 02Q .0501(b)(2). The Rule states:

(b) *With the exception in Paragraph (c) of this Rule, the owner or operator of an existing facility, new facility, or modification of an existing facility (except for minor modifications under Rule .0515), including significant modifications that would not contravene or conflict with a condition in the existing permit, subject to the requirements of this Section shall not begin construction without first obtaining:*

(1) ..., or

(2) *a construction and operation permit following the procedures set forth in 15A NCAC 02Q .0504 and filing a complete application within 12 months after commencing operation to modify the construction and operation permit to meet the requirements of this Section.*

- **Application 3600078.19A**

This Part I application was received February 28, 2019 for the following sources: ES-PROD01, ES-PROD02, ES-PROD03, ES-PROD04, ES-RM101, ES-RM102, ES-RM201 and ES-RM202. Emission sources ES-PROD01, ES-PROD02, ES-RM101 and ES-RM201 began operation in November 2022. Emission sources ES-PROD03, ES-PROD04, ES-RM102 and ES-RM202 are no longer planned to be constructed and the facility has requested that these sources be removed from the permit.

- **Application 3600078.21A**

This Part I application was received on January 4, 2021 for the Solvent SLMP Process (ID No. ES- Kilo). This source began operation on October 12, 2023.

- **Application 3600078.22A**

This 502(b)(10) notification was received on November 1, 2022. Livent proposes to add a transfer (drop point) in the Lithium Hydroxide Production process, specifically the ES-LOH-02 Dust Collection System.

The Permittee was last issued a construction and operation permit on December 2, 2021 (03560T53). According to the Part II application received on September 7, 2023 (3600078.23B), the sources permitted with application 3600078.19A commenced operation in November 2022 and the sources permitted with application 3600078.21A commenced operation on October 12, 2023. Therefore, this Part II application was received within the 12-month period after commencing operation, as required. The technical reviews for the Part I applications (3600078.19A and 3600078.21A) are attached to this document.

## 2. Facility Description

This facility manufactures lithium based organic and inorganic compounds to be used in batteries, pharmaceuticals, and many other industrial applications. The facility generally operates 24 hours a day, 7 days a week. The facility has approximately 200 employees.

## 3. Application Chronology

November 1, 2022	502(b)(10) application (.22A) received
September 7, 2023	Part II application (.23B) received
September 28, 2023	Application fee of \$1002 received
November 8, 2023	Draft to applicant and Mooresville Regional Office (MRO)
November 22, 2023	Draft to public notice and EPA
December 22, 2023	Public comment period expires
January 6, 2024	EPA Comment period expires
DRAFT	Final Permit issued

#### 4. Permit Modifications/Changes

The table below outlines the proposed changes to the current permit (03560T53):\*

Page No.	Section	Description of Changes
Cover Letter	---	Modified to reflect current permit number, issue and effective dates
All	Headers	Amended permit revision number
1-43	Entire permit, where applicable	Modified to reflect current permit number, issue and effective dates
4	Section 1	Renamed “Lithium Hydroxide Production” to “Hyd Line 1”
5	Section 1	Renamed “Plant 1” to “Hyd Line 2”
5 19-26	Section 1 2.1 J-M	Renamed the following sources: ES-PROD01 to ES-LOH03, ES-PROD02 to ES-LOH04, ES-RM101 to ES-LC101, ES-RM201 to ES-LIME201
5 19-26, 35	Section 1 2.1 J-M & Section 3	Delete “Plant 2” along with emission sources ES-PROD03, ES -PROD04, ES-RM102, ES-RM202 & IES-ENG8. These sources will not be constructed.  Removed above-listed emission sources
5	Section 1	Removed footnotes ** and *** from table of permitted emission sources
11 & 34	2.1 D.1 & 2.2 F.1	Removed “15A NCAC 02Q .0504: OPTION FOR OBTAINING CONSTRUCTION AND OPERATION PERMIT”. This application satisfies these requirements.
35	Section 3	Moved Insignificant Activities list from attachment to Section 3
36-43	Section 4	Updated General Conditions to version 7.0 (08/21/2023) and moved to Section 4.

\* This list is not intended to be a detailed record of every change made to the permit but a summary of those changes.

#### 5. TVEE Discussion

The following changes were made to the Title V Equipment Editor (TVEE) under this permit modification:

Old Name	New Name	Revised Description
ES-PROD1	ES-LOH03	One Steam-heated Lithium Hydroxide Rotary Dryer with Fines Dissolver, Product Screener and Material Transfer Filters
ES-PROD2	ES-LOH04	Lithium Hydroxide Transfer and Packaging and Material Transfer Filter
ES-RM101	ES-LC101	Lithium Carbonate Storage and Handling with Material Transfer Filter
ES-RM201	ES-LIME201	Lime Storage and Handling with Material Transfer Filters
IES-ENG7 (GACT ZZZZ)	IES-ENG7 (NSPS IIII, GACT ZZZZ)	One diesel-fired fire pump engine at Hyd Line 2 (150 kW)

The following device deletions were made to TVEE under this permit modification. These sources were previously permitted sources for Plant 2, but they will not be installed; ES-PROD-3, ES-PROD-4, RM-102, RM-202 & IES-ENG8.

**6. 502(b)(10) Notification (3600078.22A)**

This 502(b)(10) change involves the addition of one new transfer (drop) point in the Lithium Hydroxide Production process, specifically the ES-LOH dust collection system. The proposed additional drop point would involve dumping bulk bags (992 lbs. each) of Lithium Hydroxide powder into a closed top tank (with tank vent to the scrubber CD-LOH02) to be mixed into an aqueous slurry prior to introduction into the Lithium Hydroxide process. The particulate generated from the drop would utilize the existing Impingement Plate Scrubber (CD-LOH02) with new ducting to collect these particulates. The existing scrubber (CD-LOH02) may require small adjustments in fan speed but within design parameters of the subject scrubber. Current monitoring and reporting under CD-LOH02 would still be applicable for the new source. This change was implemented late November 2022 and requires no change to the facility’s permit.

*I. Regulatory Review*

A. Lithium hydroxide packaging dust collection system (ID No. ES-LOH02) with associated impingement plate scrubber (ID No. CD-LOH02)

1. 15A NCAC 02D .0515 – Particulates from Miscellaneous Industrial Processes

This regulation establishes an allowable emission rate for particulate matter from any stack, vent, or outlet resulting from any industrial process for which no other emission control standards are applicable. The regulation applies to Total Suspended Particulate (TSP) or PM less than 100 micrometers (µm). The allowable emission rate is calculated using the following equation:

$$\begin{aligned} E &= 4.10 \times P^{0.67} && \text{for } P \leq 30 \text{ tph} \\ E &= 55 \times P^{0.11} - 40 && \text{for } P > 30 \text{ tph} \end{aligned}$$

Where: E = allowable emission rate in pounds per hour (lb/hr)  
P = process weight rate tons per hour (tph)

The process rate (P) for the Lithium hydroxide packaging dust collection (ID No. ES-LOH02) is 1.75 tons per hour.

$$\begin{aligned} \text{Therefore } E &= 4.10 \times P^{0.67} \\ E(\text{ES-LOH02}) &= 5.97 \text{ lb/hr} \end{aligned}$$

2. 15A NCAC 02D .0521 – Control of Visible Emissions

Visible emissions for emission source (**ID Nos. ES-LOH02**) are limited to an opacity of 40%. Visible emissions (VE) shall not be more than 40 percent opacity when averaged over a six-minute period. However, six-minute averaging periods may exceed 40 percent not more than once in any hour and not more than four times in any 24-hour period. In no event shall the six-minute average exceed 90 percent opacity. To ensure compliance, the facility is required to observe emission points once a month and record the observations in a logbook. The logbook shall record the following: the date and time of each recorded action; the results of each observation; and the results of any corrective actions performed. They are also required to submit a semiannual summary report of the observations.

*II. Emissions Summary*

Changes in emissions (PM, PM<sub>10</sub>, and PM<sub>2.5</sub>) from the existing Lithium hydroxide packaging dust collection system (ID No. ES-LOH02) to the modified Lithium hydroxide packaging dust collection system is shown in the tables below:

**Table 1**  
**Modified Lithium Hydroxide (LiOH) Material Handling Emissions**  
Includes Controlled drops, Pneumatic conveying and new Dissolver tank drop

Pollutant	Uncontrolled Emissions			Controlled Emissions		
	lb/hr	lb/yr	tpy	lb/hr	lb/yr	tpy
PM	63.35	554,965	277.48	0.72	6,294	3.15
PM <sub>10</sub>	59.55	521,667	260.83	0.68	5,916	2.96
PM <sub>2.5</sub>	49.41	432,873	216.44	0.56	4,909	2.45

**Table 2**  
**Existing Lithium Hydroxide (LiOH) Material Handling Emissions**  
Includes Controlled drops, Pneumatic conveying

Pollutant	Uncontrolled Emissions			Controlled Emissions		
	lb/hr	lb/yr	tpy	lb/hr	lb/yr	tpy
PM	62.73	549,534	274.77	0.71	6,185	3.09
PM <sub>10</sub>	58.97	516,562	258.28	0.66	5,814	2.91
PM <sub>2.5</sub>	48.93	428,636	214.32	0.55	4,824	2.41

**Table 3**  
**Change in Emissions**

Pollutant	Uncontrolled Emissions			Controlled Emissions		
	lb/hr	lb/yr	tpy	lb/hr	lb/yr	tpy
PM	0.62	5,431	2.72	0.01	109	0.05
PM <sub>10</sub>	0.58	5,105	2.55	0.01	102	0.05
PM <sub>2.5</sub>	0.48	4,236	2.12	0.01	85	0.04

**7. Other Regulatory Requirements**

- An application fee of \$1002 is required and was received by DAQ on 9/28/23.
- The appropriate number of application copies was received with the submittal of application.
- Gaston County has triggered increment tracking under PSD for PM<sub>10</sub>, SO<sub>2</sub> and NO<sub>x</sub>. Any increment changes associated with this modification were addressed in the Part I permit application Nos. 3600078.19A and 3600078.21.B.
- A notice of the DRAFT Title V Permit shall be made pursuant to 15A NCAC 02Q .0521. The notice will provide for a 30-day comment period, with an opportunity for a public hearing. Consistent with 15A NCAC 02Q .0525, the EPA will have a concurrent 45-day review period. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA. Pursuant to 15A NCAC 02Q .0522, a copy of each permit application, each proposed permit and each final permit shall be provided to EPA. Also, pursuant to 02Q .0522, a notice of the DRAFT Title V Permit shall be provided to each affected State at or before the time notice is provided to the public under 02Q .0521 above.
- The associated dates are listed in the Application Chronology section above.

**8. Facility Compliance Status/Compliance History:**

DAQ has reviewed the compliance status of this facility with respect to its Title V Air Permit. The most recent inspection of the facility was conducted on August 15, 2023, by Mr. Seth Hall with the Mooresville Regional Office (MRO). According to Mr. Hall’s inspection report, “the facility appeared to be in compliance with the applicable air quality regulations”.

**9. Conclusions, Comments and Recommendations**

The issuance of Air Quality Permit No. 03560T54 to Livent USA Corp. is recommended.

**NORTH CAROLINA DIVISION OF  
AIR QUALITY**

## Application Review

**Issue Date:** October 17, 2019

**Region:** Mooresville Regional Office  
**County:** Gaston  
**NC Facility ID:** 3600078  
**Inspector's Name:** Denise Hayes  
**Date of Last Inspection:** 08/15/2018  
**Compliance Code:** 3 / Compliance - inspection

Facility Data			Permit Applicability (this application only)				
<b>Applicant (Facility's Name):</b> FMC Lithium USA Corporation  <b>Facility Address:</b> FMC Lithium USA Corporation 1115 Bessemer City - Kings Mtn. Hwy. Bessemer City, NC 28016  <b>SIC:</b> 2819 / Industrial Inorganic Chemicals <b>NAICS:</b> 325188 / All Other Basic Inorganic Chemical Manufacturing  <b>Facility Classification: Before:</b> Title V <b>After:</b> Title V <b>Fee Classification: Before:</b> Title V <b>After:</b> Title V			<b>SIP:</b> 15A NCAC 02D .0515 and .0521 <b>NSPS:</b> N/A <b>NESHAP:</b> N/A <b>PSD:</b> N/A <b>PSD Avoidance:</b> N/A <b>NC Toxics:</b> N/A <b>112(r):</b> N/A <b>Other:</b> N/A				
Contact Data			Application Data				
Facility Contact	Authorized Contact	Technical Contact	<b>Application Number:</b> 3600078.19A <b>Date Received:</b> 02/28/2019 <b>Application Type:</b> Modification <b>Application Schedule:</b> TV-Sign-501(b)(2) Part I <b>Existing Permit Data</b> <b>Existing Permit Number:</b> 03560/T48 <b>Existing Permit Issue Date:</b> 06/29/2018 <b>Existing Permit Expiration Date:</b> 11/30/2019				
Rodney Willis Sr. Environmental Engineer (704) 868-7630 1115 Bessemer City - Kings Mtn. Highway Bessemer City, NC 28016	Larry Spickard Plant Manager (704) 868-0833 1115 Bessemer City - Kings Mtn. Highway Bessemer City, NC 28016	Rodney Willis Sr. Environmental Engineer (704) 868-7630 1115 Bessemer City - Kings Mtn. Highway Bessemer City, NC 28016					
Total Actual emissions in TONS/YEAR:							
CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2017	0.1200	18.19	4.39	15.19	13.32	2.28	1.79 [Chlorine]
2016	0.1200	18.45	4.25	15.42	12.63	2.71	2.22 [Chlorine]
2015	0.1320	21.13	4.62	17.66	12.68	3.45	2.89 [Chlorine]
2014	0.1200	19.76	5.21	16.53	11.13	2.48	2.30 [Chlorine]
2013	0.1000	17.88	5.64	15.02	9.56	2.39	2.19 [Chlorine]
<b>Review Engineer:</b> Brian Bland  <b>Review Engineer's Signature:</b> _____ <b>Date:</b> 10/17/2019				<b>Comments / Recommendations:</b> <b>Issue</b> 03560/T49 <b>Permit Issue Date:</b> 10/17/2019 <b>Permit Expiration Date:</b> 11/30/2019			

## 1. Introduction and Purpose of Application

Located in Bessemer City, Gaston County, FMC Lithium USA Corporation (FMC) manufactures lithium compounds for use in batteries, pharmaceuticals, and other industrial applications.

As presented in Application No. 3600078.19A, FMC proposes to add two new production lines (Plant 1 and Plant 2). The proposed modification constitutes a significant modification of the Title V Air Quality Permit. FMC has chosen to use the two-step significant modification procedures pursuant to 15A NCAC 02Q .0501(b). This first step modification is being processed in accordance with state permitting procedures. Within 12 months of start-up of any of the modified equipment, FMC will be required to submit a complete Title V application.

## 2. Changes to Permit /Application Chronology

The following table describes the modifications to the current permit:

Page(s)	Section	Description of Change(s)
All	All	Corrected typographical errors and updated dates and permit revision number
N/A	Insignificant Activities	Labeled gasoline storage tank (part of ID No. IES-FUELTANKS) as subject to GACT CCCCCC Added Plant 1 and Plant 2 diesel-fired emergency fire pump engines
3	1	Added new emissions sources and associated control devices. Plant 1 and Plant 2 each include the following emission sources: <ul style="list-style-type: none"> <li>One Steam-heated Product Rotary Dryer with fines dissolver, product screener, and material transfer filters</li> <li>Finished Product Transfer and Packaging and material transfer filter</li> <li>Raw Material 1 Storage and Handling with material transfer filter</li> <li>Raw Material 2 Storage and Handling with material transfer filters</li> </ul> Added *** footnote that the Permittee shall file a Title V Air Quality Permit Application on or before 12 months after commencing operation for new emissions sources and associated control devices.
35	2.1 P	Added Steam-heated Product Rotary Dryers section
38	2.1 Q	Added Finished Product Transfer and Packaging section
40	2.1 R	Added Raw Material 1 Storage and Handling section
43	2.1 S	Added Raw Material 2 Storage and Handling section
54	2.2 G	Added 15A NCAC 02Q .0504 condition for completion of the two-step significant modification
54	3	Updated General Conditions to current version

February 28, 2019 DAQ received Permit Application No. 3600078.19A for a two-step significant modification.

April 24, 2019 Additional information requested clarifying arrangement of control devices relative to emission sources.

May 3, 2019 Control devices positioning discussed. Additional information still required: Form C8 (for CD-SCR3) will be resubmitted to correct error and supporting documentation for control efficiencies.

May 8, 2019 Additional information requested: confirmation of accuracy of draft equipment table reflecting control devices positioning and filter surface area for ID Nos. CD-PRODFIL1 and CD-PRODFIL2.

July 1, 2019 Addendum submitted to address additional information request as well as changes in project.

- July 17, 2019 Updated emissions calculations for ES-RM201 and ES-RM202 and B form for ES-RM202 submitted as the final version of these was not in the Addendum submitted July 1.
- July 19, 2019 Additional Information Requested: application requested that some of the submitted information be treated as confidential, but did not include the reason(s) why the information should be treated as confidential as required by 15A NCAC 02Q .0107(b).
- July 30, 2019 In response to the July 19, 2109 Additional Information Request,” ...FMC Lithium USA Corp removes the request for confidential treatment of portions of the application (App. No. 3600078.19A)...”
- August 29, 2019 Draft permit forwarded to Rodney Willis of FMC and Michael Sussman of ERM (consultant to FMC).
- August 29, 2019 Draft permit and review document forwarded to Mooresville Regional Office (MRO) for comments.
- September 6, 2019 Comments on draft permit received from FMC.
- September 13, 2019 Teleconference with Michael Sussman regarding changes proposed by FMC on draft permit.
- October 1, 2019 Revised comments on draft permit received from FMC.
- October 8, 2019 Revised draft permit sent to Rodney Willis of FMC and Michael Sussman of ERM.
- October 9, 2019 Draft permit and review document sent to MRO for comments.
- October 10, 2019 MRO response received that they have no comments on the drafts.
- October 15, 2019 FMC responds that they do not have any further comments on the draft permit.

### 3. Modification Discussion

For the initial application and addendum, the Permittee submitted a public/sanitized version of the application as well as a confidential version. However, on July 30, 2019, the request for information to be treated as confidential was withdrawn.

The application involves a project to add two new production lines (Plant 1 and Plant 2). The individual emission sources and associated control devices are summarized in the table below. Note: Form A2 of Application No. 3600078.19A identified multiple control devices (ID Nos. CD-PRODFIL1 through CD-PRODFIL6 and CD-RMFIL1 through CD-RMFIL6 in the application and in the process flow diagram in Section 8 below) to be added as control devices. However, FMC notes that these filters are inherent to the emission sources pursuant the November 14, 1995 EPA Memorandum “Calculating Potential to Emit (PTE) and Other Guidance for Grain Handling Facilities” (included in Appendix C of the application). Specifically, as stated on the C1 Forms, these filters are used as material transfer systems (CD-RMFIL1 through CD-RMFIL6) and material conservation systems (CD-PRODFIL1 through CD-PRODFIL6) and are “not directly used to control air emissions.” As such, these filters were not included as control devices in the revised air permit.



Plant 1			
ID No.	Emission Source	Control Device(s)	
ES-PROD01	One Steam-heated Product Rotary Dryer with fines dissolver, product screener, and material transfer filters	ID No. CD-SCR1	Venturi-type Wet Scrubber
		ID No. CD-SCR2	Venturi-type Wet Scrubber
ES-PROD02	Finished Product Transfer and Packaging and material transfer filter	ID No. CD-SCR2	Venturi-type Wet Scrubber
ES-RM101	Raw Material 1 Storage and Handling with material transfer filter	ID No. CD-SCR1	Venturi-type Wet Scrubber
ES-RM201	Raw Material 2 Storage and Handling with material transfer filters	ID No. CD-SCR1	Venturi-type Wet Scrubber
Plant 2			
ID No.	Emission Source	Control Device(s)	
ES-PROD03	One Steam-heated Product Rotary Dryer with fines dissolver, product screener, and material transfer filters	ID No. CD-SCR3	Venturi-type Wet Scrubber
		ID No. CD-SCR4	Venturi-type Wet Scrubber
ES-PROD04	Finished Product Transfer and Packaging and material transfer filter	ID No. CD-SCR4	Venturi-type Wet Scrubber
ES-RM102	Raw Material 1 Storage and Handling with material transfer filter	ID No. CD-SCR3	Venturi-type Wet Scrubber
ES-RM202	Raw Material 2 Storage and Handling with material transfer filters	ID No. CD-SCR3	Venturi-type Wet Scrubber

Emissions from individual permitted emission sources are summarized in the table below. As can be seen in the process flow diagram in Section 8 below, and is fully detailed in Application No. 3600078.19A, each permitted item consists of multiple sources of emissions.

Emission Source	PM		PM <sub>10</sub>		PM <sub>2.5</sub>	
	potential	actual	potential	actual	potential	actual
Steam-heated Product Rotary Dryer (ES-PROD01 and 03)	197.36	1.17	55.36	0.94	41.61	0.34
Finished Product Transfer and Packaging (ES-PROD02 and 04)	26.77	0.90	17.26	0.71	6.38	0.25
Raw Material 1 Storage and Handling (ES-RM101 and 102)	19.36	0.57	11.51	0.44	4.32	0.16
Raw Material 2 Storage and Handling (ES-RM201 and 202)	17.21	0.34	10.23	0.25	3.84	0.09
Project totals (both Plants)	521.40	5.97	188.71	4.66	112.31	1.68

- Emissions shown in tons/year
- Potential emissions are uncontrolled
- Each of the two proposed Plants consists of one of each emission source

#### 4. State Regulatory Review

##### 15A NCAC 02D .0515 “Particulates from Miscellaneous Industrial Processes”

This regulation establishes an allowable emission rate for particulate matter from any stack, vent, or outlet resulting from any industrial process for which no other emission control standards are applicable. This regulation applies to Total Suspended Particulate (TSP) or PM less than 100 micrometers ( $\mu\text{m}$ ). The allowable emission rate is calculated using the following equations:

$$\begin{aligned} E &= 4.10 \times P^{0.67} && \text{for } P \leq 30 \text{ tph} \\ E &= 55 \times P^{0.11} - 40 && \text{for } P > 30 \text{ tph} \end{aligned}$$

where, E = allowable emission rate (lb/hr)  
P = process weight rate (tons/hr)

FMC will comply with these limits using the control devices (listed below with particulate control efficiencies claim in application calculations), as well as continued following of the monitoring, recordkeeping and reporting requirements associated with this rule. Compliance with this standard is expected.

The compliance calculation for ID No. ES-PROD3 screening transfer controlled by wet scrubber (ID No. CD-SCR4) is shown below. It is noted that compliance is expected while this specific process has the highest lb PM/ton throughput emission factor and is controlled by the control device with the lowest PM control efficiency.

##### Necessary values from application

Throughput 0.80 ton/hr

PM emission factor: 6.10 lb/ton [AP-42 5<sup>th</sup> Edition, Section 11.17-4]

PM control efficiency of ID No. SCR4: 95% [95% efficiency claimed for all scrubbers was less than manufacturer’s specification of 99.9%]

PM capture efficiency of ID No. SCR4: 100%

##### 15A NCAC 2D .0515 calculations

Expected PM emissions = (0.80 ton/hour) (6.1 lb/ton)(1-.95) = 0.244 lb/hr

Allowed PM emissions =  $4.1(0.80)^{.67} = 3.53$  lb/hr

##### 15A NCAC 02D .0521 “Control of Visible Emissions”

Visible emissions (VE) standards provided in this regulation are applicable to potential VE from any stack, vent, or outlet. This regulation limits visible emissions to no more than 20 percent opacity when averaged over a six-minute period, except that six-minute periods averaging not more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period.

The associated permit conditions will require that FMC establish normal for the new sources in the first 30 days of operation. FMC will comply with these limits using the control devices described elsewhere, as well as continued following of the monitoring, record keeping and reporting requirements associated with this rule. Compliance with this standard is expected.

#### 5. NSPS, NESHAP, CAM

##### NSPS

No NSPS applies to a permitted emission source added as part of this modification. However, the Plant 1 and Plant 2 diesel-fired emergency fire pump engines added to the insignificant activities list are both subject to NSPS III “Stationary Compression Ignition Internal Combustion Engines.” Included as an Attachment to this document is the NSPS III permit condition (with the non-applicable non-emergency and existing engine language removed for readability) from the Specific Permit Conditions Regulatory Guide (from the link: <http://deq.nc.gov/about/divisions/air-quality/air-quality-permits/specific-permit-conditions-regulatory-guide> as included in the Insignificant Activities per 15A NCAC 02Q .0503(8) Attachment to Air Permit No. 03560T49).

NESHAP

No NESHAP applies to a permitted emission source added as part of this modification. However, the Plant 1 and Plant 2 diesel-fired emergency fire pump engines added to the insignificant activities list are both subject to NESHAP ZZZZ “Reciprocating Internal Combustion Engines.” Both fire pump engines will demonstrate compliance with NESHAP ZZZZ through compliance with NSPS IIII requirements.

CAM

FMC will use control devices to meet the federally-enforceable 15A NCAC 02D .0515 PM limits (see Section 4). The potential emissions of PM from each proposed product dryer (ID Nos. ES-PROD01 and PROD03) will exceed 100 tpy. As described in the application, because the post-control emissions of PM from each source will be less than 100 tpy, so FMC will be required to submit the CAM monitoring plan as part of the application for permit renewal [40 CFR 64.5(b)].

**6. Facility Compliance Status**

The last full inspection of this facility was completed on May 8, 2019 by Denise Hayes of the MRO. At the time of inspection, “the facility appeared to be in compliance with the applicable air quality regulations.”

Notices of Violation issued in the last 5 years

August 25, 2015: NOV issued for the failure to conduct an annual inspection of packed bed scrubber (ID No. CD-LCL02) in 2014.

August 23, 2018: NOV/NRE issued for failure to conduct and record 16 daily checks of the scrubber (ID No. CD-LOH01-2) water supply during May – July 2018.

**7. Other Regulatory Concerns**

A P.E. seal was included with this modification.

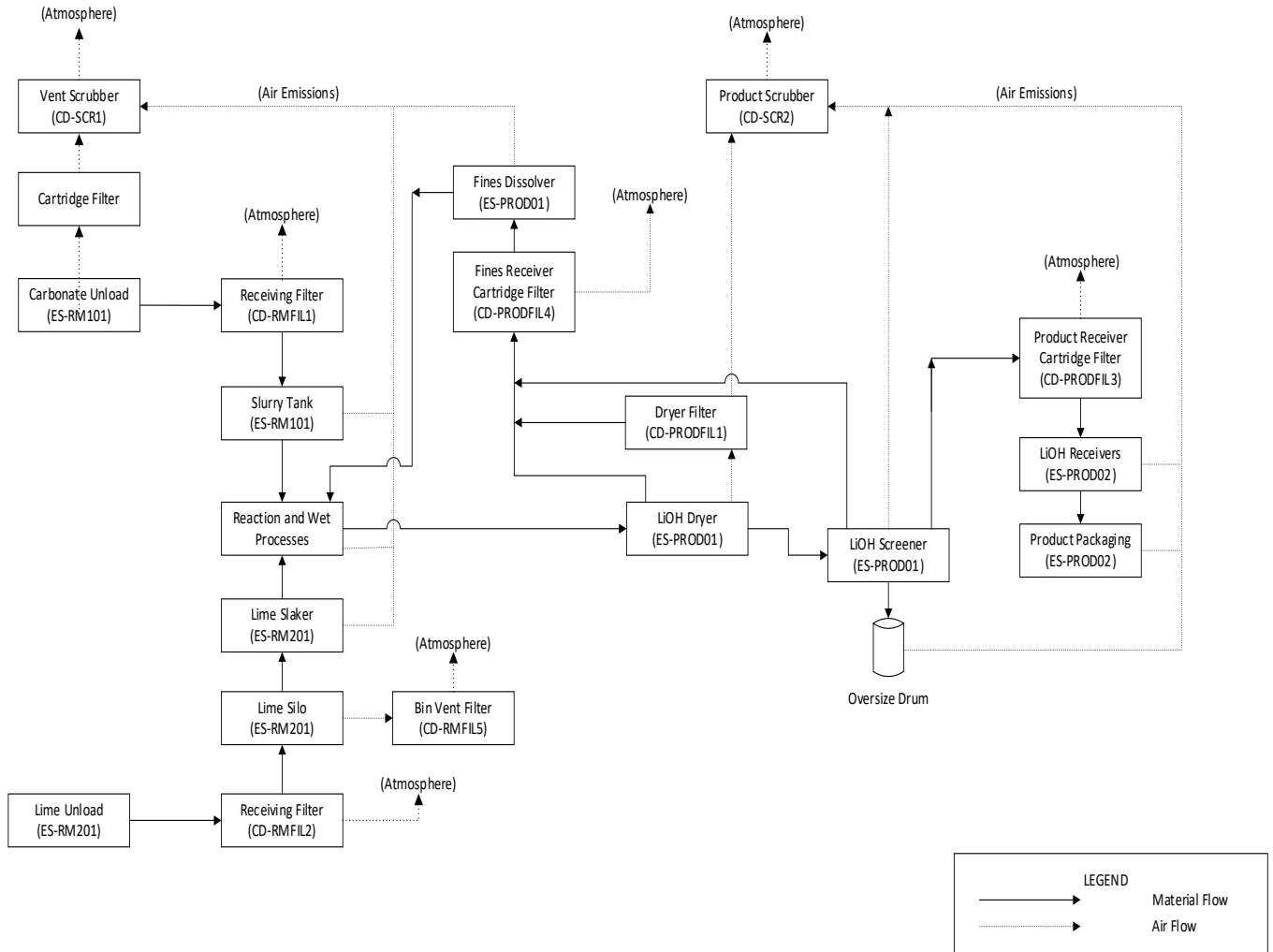
A zoning consistency form was included with this modification.

An application fee of \$970 was required and received for this modification.

No public notice or EPA review period is required for this 1st step of a two-part 15A NCAC 02Q .0501(b)(2) significant modification.

### 8. Process Flow Diagram

A process flow diagram for Plant 1 is provided below. The process flow diagram for Plant 2 is the same, but with the equipment ID Nos. described above.



## Attachment 1

15A NCAC 2D .0524 "NEW SOURCE PERFORMANCE STANDARDS" - For the following equipment, The Permittee shall comply with all applicable provisions, including the notification, testing, reporting, recordkeeping, and monitoring requirements contained in Environmental Management Commission Standard 15A NCAC 2D .0524 "New Source Performance Standards" (NSPS) as promulgated in 40 CFR 60, Subpart indicated below, and including Subpart A "General Provisions."

Emission Source(s)	Regulation
IES-ENG6 and IES-ENG7	40 CFR 60, Subpart III "Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE)"

## a. Emission Standards:

**FOR NON-EMERGENCY AND EMERGENCY ENGINES**

- i. Owners and operators of stationary CI ICE must operate and maintain stationary CI ICE that achieve the emission standards as required in 40 CFR 60.4204 and 60.4205 over the entire life of the engine.
  - A. Limit the emissions of NO<sub>x</sub> in the stationary CI ICE exhaust as listed in 40 CFR 60.4204(c).[60.4204(c)]
  - B. Reduce particulate matter (PM) emissions by 60 percent or more, or limit the emissions of PM in the engine exhaust to 0.15 grams per KW-hour (0.11 grams per HP-hour).[60.4204(c)(4)]

**FOR EMERGENCY ENGINES**

- i. For the 2007 model year and later emergency stationary CI ICE with a displacement of less than 30 liters per cylinder that are not fire pump engines, the Permittee must comply with the emission standards for new nonroad CI engines in 40 CFR 60.4202, for all pollutants, for the same model year and maximum engine power. [60.4205(b)]
- ii. For the fire pump engines with a displacement of less than 30 liters per cylinder, the Permittee must comply with the emission standards in Table 4 of 40 CFR 60 Subpart III, for all pollutants. [60.4205(c)]
- iii. For the emergency stationary CI ICE with a displacement of greater than or equal to 30 liters per cylinder, the Permittee must meet the following requirements:
  - A. Limit the emissions of NO<sub>x</sub> in the stationary CI ICE exhaust as listed in 40 CFR 60.4205(d).[60.4205(d)(1) and (d)(2)]
  - B. Limit the emissions of PM in the stationary CI ICE exhaust to 0.40 g/KW-hr (0.30 g/HP-hr).[60.4205(d)(3)]

## b. Fuel Requirements:

**FOR NON-EMERGENCY AND EMERGENCY ENGINES**

- i. Engines subject to this subpart with a displacement of less than 30 liters per cylinder that use diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.510(b) for nonroad diesel fuel, as listed below, except that any existing diesel fuel purchased (or otherwise obtained) prior to October 1, 2010, may be used until depleted. [60.4207(b)]
  - A. Has a maximum sulfur content of 15 ppm; and [40 CFR 80.510(b)]

- B. Has a minimum cetane index of 40 or a maximum aromatic content of 35 volume percent. [40 CFR 80.510(b)]
- ii. Beginning June 1, 2012, owners and operators of stationary CI ICE subject to this subpart with a displacement of greater than or equal to 30 liters per cylinder must use fuel that meets a maximum per-gallon sulfur content of 1,000 parts per million (ppm). [60.4207(d)]
- c. Monitoring Requirements:

**FOR EMERGENCY ENGINES**

- i. For the emergency stationary CI ICE that does not meet the standards applicable to non-emergency engines, the Permittee must install a non-resettable hour meter prior to startup of the engine. [60.4209(a)]
- d. Compliance Requirements:

**FOR NON-EMERGENCY AND EMERGENCY ENGINES**

- i. The Permittee must do all the following, except as permitted under 40 CFR 60.4211(g):[60.4211(a)]
  - A. operate and maintain the stationary CI ICE and control device according to the manufacturer's written emission-related instructions or procedures developed by the Permittee that are approved by the engine manufacturer. [60.4211(a)(1)]
  - B. Change only those emission-related settings that are permitted by the manufacturer [60.4211(a)(2)]; and
  - C. Meet the requirements of 40 CFR parts 89, 94 and/or 1068, as applicable. [60.4211(a)(3)]
- ii. For the 2007 model year and later stationary CI ICE that must comply with the emission standards specified in 40 CFR 60.4204(b) or 4205(b), or for the CI fire pump engine that is manufactured during or after the model year that applies to the fire pump engine power rating in Table 3 to 40 CFR 60 Subpart IIII that must comply with the emission standards specified in 40 CFR 60.4205(c), the Permittee must comply by purchasing an engine certified to the emission standards in 40 CFR 60.4204(b), or 4205(b) or (c), as applicable, for the same model year and maximum (or in the case of fire pumps, NFPA nameplate) engine power. The engine must be installed and configured according to the manufacturer's emission-related specifications, except as permitted in 40 CFR 60.4211(g).[60.4211(c)]
- iii. For the stationary CI ICE with a displacement of greater than or equal to 30 liters per cylinder, the Permittee must demonstrate compliance according to the following requirements:
  - A. Conducting an initial performance test to demonstrate initial compliance with the emission standards as specified in 40 CFR 60.4213. [60.4211(d)(1)]
  - B. Establishing operating parameters to be monitored continuously to ensure the stationary ICE continues to meet the emission standards. The Permittee must petition EPA for approval of operating parameters to be monitored continuously. The petition must include the information described in 40 CFR 60.4211(d)(2)(i) through (v). [60.4211(d)(2)]
  - C. For non-emergency engines with a displacement of greater than or equal to 30 liters per cylinder, conducting annual performance tests to demonstrate continuous compliance with the emission standards as specified in 40 CFR 60.4213. [60.4211(d)(3)]

- iv. An owner or operator of a modified or reconstructed stationary CI ICE that must comply with the emission standards of 40 CFR 60.4204(e) or 60.4205(f) must demonstrate compliance according to **one** of the following methods: [60.4211(e)]
  - A. Purchasing, or otherwise owning or operating, and engine certified to the emission standards in 40 CFR 60.4204(e) or 60.4205(f), as applicable. [60.4211(e)]
  - B. Conducting a performance test to demonstrate initial compliance with the emission standards according to the requirements specified in 40 CFR 60.4212 or 60.4213, as appropriate. The test must be conducted within 60 days after the engine commences operation after the modification or reconstruction. [60.4211(e)]
- v. If the Permittee does not install, configure, operate, and maintain the engine and control device according to the manufacturer's emission-related written instructions, or if the Permittee changes emission-related settings in a way that is not permitted by the manufacturer, the Permittee must demonstrate compliance per the requirements of 40 CFR 60.4211(g). [60.4211(g)]

#### **FOR EMERGENCY ENGINES**

- vi. The Permittee must operate the emergency stationary ICE according to the requirements in paragraphs A through C below. In order for the engine to be considered an emergency stationary ICE under this subpart, any operation other than emergency operation, maintenance and testing, emergency demand response, and operation in non-emergency situations for 50 hours per year, as described in paragraphs A through C below, is prohibited. If you do not operate the engine according to the requirements in paragraphs A through C below, the engine will not be considered an emergency engine under this subpart and must meet all requirements for non-emergency engines. [60.4211(f)]
  - A. There is no limit on the use of emergency stationary ICE in emergency situations.
  - B. You may operate your emergency stationary ICE for any combination of the purposes specified in paragraphs I through III below for a maximum of 100 hours per calendar year. Any operation for non-emergency situations as allowed by paragraph C below counts as part of the 100 hours per calendar year allowed by this paragraph B.
    - I. Emergency stationary ICE may be operated for maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine. The Permittee may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the Permittee maintains records indicating that federal, state, or local standards require maintenance and testing of emergency ICE beyond 100 hours per calendar year.
    - II. Emergency stationary ICE may be operated for emergency demand response for periods in which the Reliability Coordinator under the North American Electric Reliability Corporation (NERC) Reliability Standard EOP-002-3, Capacity and Energy Emergencies (incorporated by reference, see 40 CFR 60.17), or other authorized entity as determined by the Reliability Coordinator, has declared an Energy Emergency Alert Level 2 as defined in the NERC Reliability Standard EOP-002-3.
    - III. Emergency stationary ICE may be operated for periods where there is a deviation of voltage or frequency of 5 percent or greater below standard voltage or frequency.
  - C. Emergency stationary ICE may be operated for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and testing and emergency demand response provided in

paragraph B above. Except as provided in paragraph I below, the 50 hours per calendar year for non-emergency situations cannot be used for peak shaving or non-emergency demand response, or to generate income for a facility to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

- I. The 50 hours per year for non-emergency situations can be used to supply power as part of a financial arrangement with another entity if all of the following conditions are met:
  - (a) The engine is dispatched by the local balancing authority or local transmission and distribution system operator;
  - (b) The dispatch is intended to mitigate local transmission and/or distribution limitations so as to avert potential voltage collapse or line overloads that could lead to the interruption of power supply in a local area or region.
  - (c) The dispatch follows reliability, emergency operation or similar protocols that follow specific NERC, regional, state, public utility commission or local standards or guidelines.
  - (d) The power is provided only to the facility itself or to support the local transmission and distribution system.
  - (e) The owner or operator identifies and records the entity that dispatches the engine and the specific NERC, regional, state, public utility commission or local standards or guidelines that are being followed for dispatching the engine. The local balancing authority or local transmission and distribution system operator may keep these records on behalf of the engine owner or operator.
  
- e. Notification Requirements: In addition to any other notification requirements to the Environmental Protection Agency (EPA), the Permittee is required to notify the Regional Supervisor, DAQ, in WRITING, of the following:

**FOR NON-EMERGENCY AND EMERGENCY ENGINES**

- i. The date construction (40 CFR 60.7) or reconstruction (40 CFR 60.15) of an affected source is commenced, postmarked no later than 30 days after such date. This requirement shall not apply in the case of mass-produced facilities which are purchased in completed form.[40 CFR 60.7(a)(1)]
- ii. A notification of the actual date of initial startup of an affected facility postmarked within 15 days after such date. [40 CFR 60.7(a)(3)]
- iii. If the stationary CI ICE is greater than 2,237 KW (3,000 HP), or has a displacement of greater than or equal to 10 liters per cylinder, or is a pre-2007 model year engine that is greater than 130 KW (175 HP) and not certified, then the Permittee must submit an initial notification as required in 40 CFR 60.7(a)(1). The notification must include the information listed in 40 CFR 60.4214(a)(1).[60.4214(a) and (a)(1)]
- iv. If the engine is an emergency stationary ICE, the Permittee is **not** required to submit an initial notification. [60.4214(b)]



## f. Recordkeeping Requirements:

**FOR NON-EMERGENCY AND EMERGENCY ENGINES**

- i. If the stationary CI ICE is greater than 2,237 KW (3,000 HP), or has a displacement of greater than or equal to 10 liters per cylinder, or is a pre-2007 model year engine that is greater than 130 KW (175 HP) and not certified, then the Permittee must keep records of the following:
  - A. All notifications submitted to comply with 40 CFR 60 Subpart IIII and all documentation supporting any notification; [60.4214(a)(2)(i)]
  - B. Maintenance conducted on the engine; [60.4214(a)(2)(ii)]
  - C. If the stationary CI ICE is a certified engine, documentation from the manufacturer that the engine is certified to meet the emission standards; [60.4214(a)(2)(iii)]
  - D. If the stationary CI ICE is not a certified engine, documentation that the engine meets the emissions standards; [60.4214(a)(2)(iv)]
  - E. If the stationary CI ICE is equipped with a diesel particulate filter, the Permittee must keep records of any corrective action taken after the backpressure monitor has notified the Permittee that the high backpressure limit of the engine is approached. [60.4214(c)]
  - F. All records required under this section shall be maintained for a period of two (2) years following the date of such record. All records shall be kept on-site and made available to DAQ personnel upon request. The Permittee shall be deemed in non-compliance with 15A NCAC 2D .0524 if recordkeeping requirements are not maintained. [40 CFR 60.7(f)]

**FOR EMERGENCY ENGINES**

- G. Starting with the model years in Table 5 to 40 CFR 60, Subpart IIII, if the emergency engine does not meet the standards applicable to non-emergency engines in the applicable model year, the Permittee must keep records of the operation of the engine in emergency and non-emergency service that are recorded through the non-resettable hour meter. The Permittee must record the time of operation of the engine and the reason the engine was in operation during that time. [60.4214(b)]

## g. Reporting Requirements:

**FOR EMERGENCY ENGINES**

- i. If you own or operate an emergency stationary CI ICE with a maximum engine power more than 100 HP that operates or is contractually obligated to be available for more than 15 hours per calendar year for purposes specified in paragraphs d.vii.B and d.vii.C above or that operates for the purposes specified in paragraph d.vii.C.I above, you must submit an annual report according to the following requirements: [60.4214(d)]
  - A. The report must contain the following information:
    - I. Company name and address where the engine is located.
    - II. Date of the report and beginning and ending dates of the reporting period.
    - III. Engine site rating and model year.

- IV. Latitude and longitude of the engine in decimal degrees reported to the fifth decimal place.
  - V. Hours operated for the purposes specified in paragraphs d.vii.B.II and III above, including the date, start time, and end time for engine operation for the purposes specified in paragraphs d.vii.B.II and III above.
  - VI. Number of hours the engine is contractually obligated to be available for the purposes specified in paragraphs d.vii.B.II and III above.
  - VII. Hours spent for operation for the purposes specified in paragraph d.vii.C.I above, including the date, start time, and end time for engine operation for the purposes specified in paragraph d.vii.C.I above. The report must also identify the entity that dispatched the engine and the situation that necessitated the dispatch of the engine.
- B. The first annual report must cover the calendar year 2015 and must be submitted no later than March 31, 2016. Subsequent annual reports for each calendar year must be submitted no later than March 31 of the following calendar year.

The annual report must be submitted electronically using the subpart specific reporting form in the Compliance and Emissions Data Reporting Interface (CEDRI) that is accessed through EPA's Central Data Exchange (CDX) ([www.epa.gov/cdx](http://www.epa.gov/cdx)). However, if the reporting form specific to this subpart is not available in CEDRI at the time that the report is due, the written report must be submitted to the Administrator at the appropriate address listed in 40 CFR 60.4.

**NORTH CAROLINA DIVISION OF  
AIR QUALITY**

## Application Review

**Issue Date: April 1, 2021**

**Region:** Mooresville Regional Office  
**County:** Gaston  
**NC Facility ID:** 3600078  
**Inspector's Name:** Emily Supple  
**Date of Last Inspection:** 02/25/2021  
**Compliance Code:** 3 / Compliance - inspection

Facility Data				Permit Applicability (this application only)			
<b>Applicant (Facility's Name):</b> FMC Lithium USA Corp.  <b>Facility Address:</b> FMC Lithium USA Corp. 1115 Bessemer City - Kings Mtn. Hwy. Bessemer City, NC 28016  <b>SIC:</b> 2819 / Industrial Inorganic Chemicals <b>NAICS:</b> 325188 / All Other Basic Inorganic Chemical Manufacturing  <b>Facility Classification: Before:</b> Title V <b>After:</b> Title V <b>Fee Classification: Before:</b> Title V <b>After:</b> Title V				<b>SIP:</b> 15A NCAC 02D .0958 and .1806 <b>NSPS:</b> N/A <b>NESHAP:</b> N/A <b>PSD:</b> N/A <b>PSD Avoidance:</b> N/A <b>NC Toxics:</b> 15A NCAC 02D .1100 <b>112(r):</b> N/A <b>Other:</b> N/A			
Contact Data			Application Data				
Facility Contact	Authorized Contact	Technical Contact					
Dave Haley Environmental & Sustainability Manager (704) 868-7630 1115 Bessemer City - Kings Mtn. Highway Bessemer City, NC 28016	Larry Spickard Plant Manager (704) 868-0833 1115 Bessemer City - Kings Mtn. Highway Bessemer City, NC 28016	Dave Haley Environmental & Sustainability Manager (704) 868-7630 1115 Bessemer City - Kings Mtn. Highway Bessemer City, NC 28016	<b>Application Number:</b> 3600078.21A <b>Date Received:</b> 01/04/2021 <b>Application Type:</b> Modification <b>Application Schedule:</b> TV-Sign-501(b)(2) Part I <b>Existing Permit Data</b> <b>Existing Permit Number:</b> 03560/T51 <b>Existing Permit Issue Date:</b> 03/29/2021 <b>Existing Permit Expiration Date:</b> 12/31/2024				
Total Actual emissions in TONS/YEAR:							
CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2019	1.08	16.33	2.54	17.24	15.12	2.77	1.71 [Chlorine]
2018	1.02	15.88	2.63	16.76	13.74	2.66	1.60 [Chlorine]
2017	0.1200	18.19	4.39	15.19	13.32	2.28	1.79 [Chlorine]
2016	0.1200	18.45	4.25	15.42	12.63	2.71	2.22 [Chlorine]
2015	0.1320	21.13	4.62	17.66	12.68	3.45	2.89 [Chlorine]
<b>Review Engineer:</b> David Hughes  <b>Review Engineer's Signature:</b> <i>David B. Hughes</i>				<b>Comments / Recommendations:</b> Issue 03560/T52 <b>Permit Issue Date:</b> April 1, 2021 <b>Permit Expiration Date:</b> February 28, 2026			
<b>Date:</b> April 1, 2021							

## I. Purpose of Applications

### Application No. 3600078.21A

Air Permit Application No. **3600078.21A** was received on **January 4, 2021** for a significant modification pursuant to 15A NCAC 02Q .0501(b)(2) Part 1 to construct and operate a new production line (Solvent Stabilized Lithium Metal Powder (SLMP) Process) to the existing (Dry SLMP Process) production line **ID No. ES-Kilo**. FMC Lithium USA Corp. (FMC Lithium) is also requesting to update emission calculations for its existing (Dry SLMP Process) production line ID No. ES-Kilo based on historic actual operating data.

### Project Description

The Bessemer City facility currently produces an SLMP product in the Kilo Lab (ID No. ES-Kilo) using a process with a hexane wash. This process results in emissions of Volatile Organic Compounds (VOCs) (consisting of mineral oil, n-hexane, and other hexane isomers), hazardous air pollutants (HAPs, consisting of n-hexane), and toxic air pollutants (TAPs, consisting of n-hexane and other hexane isomers). With this application, FMC Lithium is proposing to produce SLMP using a different process, involving a non-HAP solvent and no hexane wash, in new production equipment. FMC expects emissions from this proposed new process to be much lower than those from the existing Kilo Lab and this “solvent” method will not utilize HAPs or TAPs.

The proposed production equipment for this new “solvent” SLMP will be wholly separate from the existing equipment and there will be no effects on existing Kilo Lab production. Additionally, this change will not affect any other processes at the Bessemer City facility.

With this application, FMC Lithium is also updating its potential to emit (PTE) calculations for the existing Kilo Lab (Dry SLMP Process). The batch process to manufacture SLMP product uses a hexane wash. The previous calculations were based on production and emission estimates made prior to construction of the Lab. Now that there are multiple years of operating data, FMC Lithium is proposing to base the Kilo Lab PTE on average emission rates per batch, with a safety factor to account for possible small variability. The result of this change will be a reduction in the annual PTE from this process. See Section VII for more details.

## II. Facility Description

FMC Lithium USA Corp. (FMC Lithium), owns and operates a lithium products manufacturing facility at 1115 Bessemer City – Kings Mountain Highway in Bessemer City, Gaston County, North Carolina (the Bessemer City facility). The facility currently operates under Title V operating permit No. 03560T50 issued by the North Carolina Department of Environmental Quality (DEQ), Division of Air Quality (DAQ). The primary SIC Code of the facility is 2819 – *Industrial Inorganic Chemicals, Not Elsewhere Classified*.

## III. Application Chronology

**October 17, 2019** – DAQ received Permit Application No. **3600078.19E** for a minor modification. The application was deemed complete for processing.

**January 15, 2020** – Air Quality Permit No. **03560T50** issued as a Title V minor modification.

**August 11, 2020** – Denise Hayes of the Mooresville Regional Office completed the annual compliance inspection of the facility.

**May 31, 2019** – DAQ received Permit Application No. **3600078.19B** for a minor modification. The application was deemed complete for processing.

**January 4, 2021** – DAQ received Permit Application No. **3600078.21A**, which is the first step of a two-step, 02Q .0501(b)(2), Significant Modification. This application was deemed complete for processing.

**February 25, 2021** – Emily Supple of the Mooresville Regional Office completed the annual compliance inspection of the facility.

**March 15, 2021** - DRAFT permit sent to Permittee, Supervisor, MRO and Samir Parekh for comment. Samir Parekh provided comments via e-mail on **March 23, 2021**. Consultant Michael Sussman (ERM NC, Inc.) states via e-mail on **March 30, 2021** that he has reviewed the draft permit and review and has no comments. Dave Haley (FMC Lithium USA Corp.) states via e-mail on **March 30, 2021** that he has reviewed the draft permit and review and has no comments. Denise Hayes and Mooresville Regional Office had no comments.

**March 29, 2021** – Air Permit No. **03560T51** issued as a Title V renewal.

**April 1, 2021** – Air Quality Permit No. **03560T52** issued.

#### IV. Permit Modifications/Changes and ESM Discussion

Page	Section	Description of Change
Global	Global	-Updated the application number and complete date. -Updated permit revision number to T52. -Updated the issuance/effective dates of the permit.
Cover Letter	Cover Letter	-Updated PSD increment tracking statement.
3 & 4	Section 1 Table	-Added Existing process (Dry SLMP Process) and New process (Solvent SLMP Process) to Emission Source Description. -Inserted footnote identifying new process (Solvent SLMP Process) (ID No. ES-Kilo) as a 15A NCAC 02Q .0501(b)(2) Part 1 Significant Modification.
10 & 11	2.1 D	-Added new process (Solvent SLMP Process) (ID No. ES-Kilo). -Added references to permit conditions for 15A NCAC 02Q .0504.

There were minor modifications to the equipment descriptions needed in Title V Equipment Editor (TVEE).

#### V. Regulatory Review

The facility is currently subject to the following regulations:

15A NCAC 02D .1100, Control of Toxic Air Pollutants (*State-Enforceable Only*)  
15A NCAC 02D .0958, Work Practices for Sources of Volatile Organic Compounds  
15A NCAC 02D .1806, Control of Odorous Emissions (*State-Enforceable Only*)

The status of these regulations have not changed with the addition of this new source. Therefore, no changes are necessary as part of this modification.

As part of the processing of the two-step significant modification pursuant to 15A NCAC 02Q .0501(b)(2), the Permittee will be required to submit a second step application within 12 months of startup of the new equipment. As such, the following permit condition will be added to the permit.

#### ***Permit Application Submittal Requirement***

##### ***1. 15A NCAC 02Q .0504: OPTION FOR OBTAINING CONSTRUCTION AND OPERATION PERMIT***

###### ***Permitting [15A NCAC 02Q .0504(d)]***

- a. Pursuant to 15A NCAC 02Q .0501(b)(2), for completion of the two-step significant modification process initiated by Application No. 3600078.21A, the Permittee shall file an amended application following the procedures of Section 15A NCAC 02Q .0500 within one year from the date of beginning operation of this source Solvent SLMP Process (**ID No. ES-Kilo**).

**Reporting** [15A NCAC 02Q .0508(f)]

- b. The Permittee shall notify the Regional Office in writing of the date of beginning operation of this source Solvent SLMP Process (**ID Nos. ES-Kilo**), postmarked no later than 30 days after such date.

**VI. NSPS, NESHAPS/MACT, PSD, 112(r), CAM****NSPS**

The Permittee is currently subject to New Source Performance Standards (NSPS). Various NSPS apply to the synthetic organic chemical manufacturing industry (SOCMI), including:

- Subpart VVa – *Standards Of Performance For Equipment Leaks Of VOC In The Synthetic Organic Chemicals Manufacturing Industry For Which Construction, Reconstruction, Or Modification Commenced After November 7, 2006*
- Subpart III – *Standards Of Performance For Volatile Organic Compound (VOC) Emissions From The Synthetic Organic Chemical Manufacturing Industry (SOCMI) Air Oxidation Unit Processes*
- Subpart NNN – *Standards Of Performance For Volatile Organic Compound (VOC) Emissions From Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations*
- Subpart RRR – *Standards Of Performance For Volatile Organic Compound (VOC) Emissions From Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes*

All of these rules define “SOCMI” as the manufacture of certain chemicals, and either contain or reference lists of chemicals and substances that are manufactured in the SOCMI. SLMP is not listed in any of the SOCMI regulations as a chemical manufactured as part of the SOCMI. In addition, the proposed SLMP production process (Solvent SLMP Process, ES-Kilo) will not any listed chemical as a product, co-product, byproduct, or intermediate. Therefore, the listed SOCMI standards do not apply to the proposed project. This permit modification does not affect this status.

**NESHAPS/MACT**

The National Emission Standards for Hazardous Air Pollutants (NESHAP) seek to regulate emissions of hazardous air pollutants (HAP) from certain industry and source types. The Part 61 NESHAP regulate certain pollutants from specific source types. The Part 63 NESHAP, also known as the Maximum Achievable Control Technology (MACT) standards, regulate HAP emissions based on source categories and emission control technologies available to each category. Sources subject to MACT standards are classified as major sources (i.e., emissions greater than 10 tpy of an individual HAP or greater than 25 tpy of total HAP) and “area” sources (i.e., sources with HAP emissions below major source levels). Part 61 NESHAP are incorporated by reference into the North Carolina SIP in 15A NCAC 02D .1110, and the MACT standards are incorporated in 15A NCAC 02D .1111.

There are no Part 61 NESHAPs potentially applicable to the proposed project (Solvent SLMP Process, ES-Kilo). Based on potential facility-wide emissions, the Bessemer City facility is classified as an area source of HAP. Therefore, no major-source MACT rules apply to the proposed project. Applicability of relevant area-source MACT standards is discussed below.

1. 40 CFR 63, Subpart VVVVVV – NESHAP for Chemical Manufacturing Area Sources

MACT Subpart VVVVVV (known as the CMAS rule) applies to chemical manufacturing facilities which use or produce certain specific HAP. The proposed process will not utilize organic, metal, or other HAP listed in Table 1 of Subpart VVVVVV at greater than 1.0% or 0.1% by weight, as specified in 40 CFR 63.11494. Therefore, the CMAS rule will not apply.

2. 40 CFR 63, Subpart BBBB BB – NESHAP for Area Sources: Chemical Preparations Industry

MACT Subpart BBBB BB applies to “chemical preparations operations” as defined in 40 CFR 63.11588. The target HAP for this rule, also defined in 40 CFR 63.11588, includes chromium, lead, manganese, and nickel. The proposed operation neither meets the definition of “chemical preparations operation” nor utilizes any of the listed target HAP. Therefore, the rule does not apply.

3. MACT Subpart JJJJJ – NESHAP for Industrial, Commercial, and Institutional Boilers Area Sources

MACT Subpart JJJJJ establishes national emission limitations and operating limitations for HAPs emitted from boilers. There are no changes to the boilers or the regulatory applicability of this subpart due to the proposed project.

This permit modification does not affect this status.

**PSD**

The PSD rules in 40 CFR 51.166 are incorporated into North Carolina environmental regulations in 15A NCAC 02D .0530. The goal of the PSD program is to prevent the formation of new nonattainment areas (as defined by the National Air Quality Standards (NAAQS)) through a federal permitting program which includes impact analysis and, if necessary, dispersion modeling demonstrations. A stationary source is considered a major source under PSD if one of the following criteria are met:

1. A stationary source which emits more than 250 tons per year (tpy) of a regulated new source review (NSR) pollutant. [40 CFR 51.166(b)(49)]
2. A stationary source meeting the description of an activity in 40 CFR 51.166(b)(1)(i)(a) which emits more than 100 tpy of a regulated NSR pollutant.

The Bessemer City facility meets the definition of a “chemical process plant” in 40 CFR 51.166(b)(1)(i)(a). Therefore, the threshold to be a PSD major source is 100 tpy of a regulated NSR pollutant. The facility has the potential to emit more than 100 tpy of VOC and NO<sub>x</sub>, and has taken limits under 15A NCAC 02Q .0317, *Avoidance Conditions*, to avoid the applicability of NSR (and, by extension, PSD). The proposed project will not increase NO<sub>x</sub> emissions, will not increase potential VOC emissions over 100 tpy, and is not by itself major for any NSR pollutant. Therefore, this project does not require PSD permitting. No new or revised limits under 15A NCAC 02Q .0317 are proposed with this application. This permit modification does not affect this status.

**112(r)** – The facility is not subject to Section 112(r) of the Clean Air Act requirements because it does not store one or more of the regulated substances in quantities above the thresholds in the Rule. This permit modification does not affect this status.

**CAM**

Pursuant to 40 CFR 64.2, the provisions of the Compliance Assurance Monitoring (CAM) rule are applicable to emission units that meet all of the following criteria:

- Criteria #1: The unit is subject to an emission limitation AND uses a control device to achieve compliance with the limit;
- Criteria #2: The unit has pre-control potential emissions that are equal to or greater than 100% of the amount (in tpy) required for a source to be classified as a major source (i.e., 100 tpy of any criteria pollutant or 10 tpy of any HAP); and,
- Criteria #3: The unit is not exempt under 40 CFR 64.2(b).

Emission limits or standards promulgated after November 15, 1990 (e.g., MACT) are not included in the applicability criteria. The proposed production process (Solvent SMLF Process, ES-Kilo) will not utilize a control device to limit VOC emissions. Therefore, the criteria for applicability of CAM are not met. This permit modification does not affect this status.

**VII. Potential to Emit (PTE)**

**Solvent SMLF, ES-Kilo (new process)**

Emissions expected from the proposed production line include VOCs. The process will use a non-HAP solvent and will not use hexane.

FMC Lithium conservatively expects to emit 13 pounds of VOC per batch of solvent-based SLMP produced. This figure is based on engineering calculations which account for a condenser in the proposed production line. The condenser is included in the process primarily to recover solvent and return it to the process, and therefore, the condenser is not classified as emission control equipment.

FMC Lithium projects that the proposed process can produce a maximum of 948 batches of SLMP per year. This is based on the anticipated batch size of 29.3 pounds per batch and anticipated production of 13.9 tons of SLMP produced per year.

#### VOC Emissions from SLMP Production (Proposed)

$$\text{Uncontrolled VOC (lb/hr)} = \text{SLMP Production} \frac{\text{ton}}{\text{yr}} \times 2,000 \frac{\text{lb}}{\text{ton}} + \text{SLMP Batch Size} \frac{\text{lb}}{\text{Batch}} \times \text{Emission Factor} \frac{\text{lb}}{\text{Batch}} + 8760 \frac{\text{hours}}{\text{yr}}$$

$$\text{Uncontrolled VOC (lb/hr)} = 13.9 \frac{\text{tons SLMP}}{\text{yr}} \times 2000 \frac{\text{lb}}{\text{ton}} + 29.3 \frac{\text{lb}}{\text{Batch}} \times 13 \frac{\text{lb VOC}}{\text{Batch}} + 8760 \frac{\text{hours}}{\text{yr}} = 1.41 \text{ lb/hr}$$

$$\text{Uncontrolled VOC (tpy)} = \text{Emission Rate} \frac{\text{lb}}{\text{hr}} \times 8760 \frac{\text{hours}}{\text{yr}} \times \frac{1 \text{ ton}}{2,000 \text{ lb}}$$

$$\text{Uncontrolled VOC (tpy)} = 1.41 \frac{\text{lb}}{\text{hr}} \times 8,760 \frac{\text{hours}}{\text{yr}} \times \frac{1 \text{ ton}}{2,000 \text{ lb}} = 6.16 \text{ tpy}$$

The following tables show detailed emission calculations for the new process:

#### **Kilo Lab (ES-Kilo) – Solvent Process**

Material	Usage			
	EF <sup>1,2</sup> (lbs/batch)	SLMP Production	Total Batch Size (lb) <sup>3</sup>	Batches per year
Mineral Oil	0.00	13.90	29.3	948
Non-HAP Solvent	13.0	13.90	29.3	948
Hexane	0.00	13.90	29.3	948

- Solvent SLMP batches will consist of 192 lb non-HAP solvent.
- Projected worst-case loss rate for solvent-based SLMP: 6.78% solvent. This rate is based on vapor pressure data, the proposed condenser, and proposed batch times.
- Batch size is based on metal produced.

Pollutant	Pollutant Category	Total Emissions			
		(lb/hr)	(lb/day)	(lb/yr)	(tpy)
VOCs	VOC	1.41	33.77	12,325.09	<b>6.16</b>

#### **Dry SMLF, ES-Kilo (existing process)**

FMC Lithium is updating its PTE calculations for the existing SLMP production process in the Kilo Lab using observed operating data to represent a more accurate worst-case scenario.

The PTE calculations traditionally used for the Kilo Lab were based on projected operating data prepared before the Lab's construction. FMC Lithium had projected a 40% hexane loss rate (31.3 pounds of hexane emitted to the air out of 78 pounds of hexane used per batch). FMC Lithium has analyzed actual operating data from the Kilo Lab from 2017 to 2020 and found that an average of 4.7% of hexane is lost per batch. In order to account



for small variability in the loss rate, FMC Lithium is proposing to use an 8% loss rate for calculating the PTE. Using the 8% loss rate and the use of 78 pounds of hexane per batch generates a revised hexane emission rate of 6.2 pounds per batch for the Kilo Lab. FMC Lithium believes that this revised rate is sufficiently conservative to represent a PTE while being more reflective of actual operations at the Bessemer City facility.

This change in emission factor leads to an overall decrease in emissions from the existing Kilo Lab. The PTE from the Kilo Lab was previously reported as 7.32 tpy n-hexane. When this new worst-case loss rate, based on actual operations, is substituted in place of the original factor, the potential n-hexane emissions are reduced from 7.32 tpy to 1.46 tpy. This only affects PTE, as actual reported annual emissions have always been based on actual operating data. The updated PTE, and its effect on facility-wide emission calculations are shown in the tables below.

#### Previous Potential Emissions Calculations Kilo Lab (ES-Kilo) – Dry Process

Material	Usages		
	VOC (lbs/batch)	# of Batches/day	# of Batches/year
Mineral Oil	0.29	2	730
Hexane	31.3	2	730

Pollutant	Pollutant Category	Total Emissions			
		(lb/hr)	(lb/day)	(lb/yr)	(tpy)
VOCs	VOC	2.64	63.24	23,082.84	11.54
Hexane, isomers except n-Hexane	T/VOC	0.94	22.56	8,232.67	4.12
n-Hexane	H/T/VOC	1.67	40.10	14,635.86	<b>7.32</b>

1. Assume 12 hours/batch minimum and 8,760 hours per year operation. 12 hours/batch, 2 batches/day, and 730 batches per year.
2. Max production assuming no downtime is (8,760 hours) to give batches a year.
3. % Hexane that is n-Hexane – 64%
4. Hexane vented to the atmosphere is calculated based on the plant engineering mass balance assuming 5 washes and: Condenser Efficiency – 1%, Wash Efficiency – 85%, and PMO tank loss – 0.5%

#### Potential Emissions Calculations Kilo Lab (ES-Kilo) – Dry Process

Material	Usages		
	VOC (lbs lost to air/batch)	# of Batches/day	# of Batches/year
Mineral Oil	0.29	2	730
Hexane	6.2	2	730

Pollutant	Total Emissions (lb/hr)	Total Emissions (lb/day)	Total Emissions (lb/yr)	Total Emissions (tpy)
VOC	0.54	13.07	4,769.51	2.38
Hexane T/VOC	0.19	4.49	1,640	0.82
n-Hexane H/T/VOC	0.33	7.99	2,915.33	<b>1.46</b>

1. Assume 12 hours/batch minimum and 8,760 hours per year operation. 12 hours/batch, 2 batches/day, and 730 batches per year.
2. Max production assuming no downtime is (8760 hours) to give batches a year.
3. The average loss rate for total hexane in Kilo Lab operations from 2017 – 2020 is 4.7%. FMC Lithium has used a conservative loss rate of 8% for these calculations.
4. % Hexane that is n-Hexane – 64%
5. Batch consists of 78 lb hexane.

### **VIII. Facility Emissions Review**

See Table in the header for a summary of the actual emissions as reported to DAQ from the years 2015 to 2019.

Gaston County has triggered increment tracking under PSD for PM<sub>10</sub>, SO<sub>2</sub>, and NO<sub>x</sub>. However, this significant modification does not consume or expand increments for any pollutants.

### **IX. Stipulation Review**

The facility was last inspected by Emily Supple on **February 25, 2021**. Based on her observations the facility appeared to be in compliance with their Title V permit requirements.

#### **Compliance History (5-year)**

08/23/18      An NOV/NRE was issued for failure to conduct daily checks of the water supply to the scrubber (ID No. CD-LOH01-2) and for failure to record the observations in the logbook. A civil penalty of \$3,084 was assessed and was paid in full.

### **X. Affected State(s) Review**

No public comment period is necessary for Part 1 501(b)(2) process. The second step application due within 12 months of start-up of the new equipment will require public notice and review prior to issuance.

### **XI. Conclusions, Comments, and Recommendations**

A professional engineer's seal was received for this significant modification Part 1.

A zoning consistency determination form was received for this significant modification Part 1.

MRO recommends issuance of the permit and was sent a DRAFT permit prior to issuance (See Section III of this document for a discussion).

RCO concurs with MRO recommendation to issue the significant modification air permit.