



Louisville Metro Air Pollution Control District
701 West Ormsby Avenue, Suite 303
Louisville, Kentucky 40203-2624



xx May 2016

Construction Statement of Basis

Source: Hexion Inc. – Louisville Plant
Owner: Hexion Inc.

Plant Location: 6200 Camp Ground Road, Louisville, KY 40216

Date Application Received: 16 October 2015	Application Number: 73951
08 December 2015	74553
21 December 2015	74698

Public Comment Date: 23 April 2016

District Engineer: Nantaporn Noosai **Permit No:** C-0028-1003-16-V

Plant ID: 0028 **SIC Code:** 2821 and 2869 **NAICS:** 325199 and 325211

Introduction:

This permit will be issued pursuant to District Regulation 2.03, *Authorization to Construct or Operate; Demolition/Renovation Notices and Permit Requirements*. Its purpose is to provide methods of determining continued compliance with all applicable requirements.

Jefferson County is classified as an attainment area for lead (Pb), nitrogen dioxide (NO₂), carbon monoxide (CO), 1 hr and 8 hr ozone (O₃), and particulate matter less than 10 microns (PM₁₀); and is a non-attainment area for the 1997 standard for particulate matter less than 2.5 microns (PM_{2.5}), unclassifiable for the 2012 standard for particulate matter less than 2.5 micron (PM_{2.5}) and partial non-attainment for sulfur dioxide (SO₂).

Application Type/Permit Activity:

- Initial Issuance
- Permit Revision
 - Administrative
 - Minor
 - Significant
- Permit Renewal
- Construction

Compliance Summary:

- | | |
|--|---|
| <input type="checkbox"/> Compliance certification signed | <input type="checkbox"/> Compliance schedule included |
| <input type="checkbox"/> Source is out of compliance | <input checked="" type="checkbox"/> Source is operating in compliance |

I. Source Information

1. Plantwide Overall Process Description: The source manufactures formaldehyde and phenolic resins.

2. Project Description: The source submitted the application requesting the removal of Packed Bed Scrubber (C26) from Silver Process (U1). The AERMOD air dispersion modeling was submitted to the District to revise the U1 and plant-wide TAC limits when the scrubber is removed.

3. Site Determination: There are no other facilities that are contiguous or adjacent and under common control.

4. Emission Unit Summary:

Construction No.	Equipment Description
31207-11-C(R1)	Removal of one (1) Packed Bed Scrubber (C26) from Formaldehyde Production - Silver Process (U1)

5. Permit Revisions

Revision No.	Permit No.	Issue Date	Public Notice Date	Change Type	Change Scope	Description
Initial	C-0028-1003-16-V	Xx/xx/2016	04/23/2016	Initial	Entire Permit	Removal of Packed Bed Scrubber (C26)

Note: Permit 0362-07-C (R1) for the Packed Bed Scrubber is void.

6. Fugitive Sources: Fugitive emissions of any part of the plant are subject to Regulation 1.14, *Control of Fugitive Particulate Emissions*.

7. Plantwide Emission Summary:

Pollutant	District Calculated Actual Emissions (tpy) 2014 Data	Pollutant that triggered major source status
CO	40.48	Yes
NO _x	20.08	No
SO ₂	0.15	Yes
PM/PM ₁₀	24.35/23.18	Yes
VOC	19.19	Yes

Pollutant	District Calculated Actual Emissions (tpy) 2014 Data	Pollutant that triggered major source status
Phenol	5.3	Yes
Formaldehyde	0.7	Yes
Methanol	4.45	Yes
Total HAPs	11.73	Yes
GHG	103,800.4*	Yes

Note: The source accepted limit on all criteria pollutant and HAPs to be synthetic minor for PSD.

*Note: The GHG are potential to emit (PTE) emissions not actual emissions.

8. Applicable Requirements:

PSD 40CFR60 SIP 40CFR63
 NSR 40CFR61 District-Origin Other

9. MACT Requirements:

This source was a major for HAPs before October 31, 2005 and is subject to the following MACT regulations:

40 CFR 63 Subpart A	General Provisions
40 CFR 63 Subpart F	National Emission Standards for Organic Hazardous Air Pollutants From the Synthetic Organic Chemical Manufacturing Industry
40 CFR 63 Subpart G	National Emission Standards for Organic Hazardous Air Pollutants From the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater
40 CFR 63 Subpart H	National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks

10. Referenced non-MACT Federal Regulations in Permit:

40 CFR 60 Subpart Kb	Standards of Performance for Volatile Organic Liquid Storage Vessels (including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984
40 CFR 60 Subpart VV	Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for which Construction, Reconstruction, or

40 CFR 60 Subpart III

Modification Commenced After January 5, 1981, and on or Before November 7, 2006 Standards of Performance for Volatile Organic Compound (VOC) Emissions From the Synthetic Organic Chemical Manufacturing Industry (SOCMI) Air Oxidation Unit Processes

II. Regulatory Analysis

1. **Acid Rain Requirements:** This source is not subject to the Acid Rain Program.
2. **Stratospheric Ozone Protection Requirements:** Title VI of the CAAA regulates ozone depleting substances and requires a phase-out of their use. This rule applies to any facility that manufactures, sells, distributes, or otherwise uses any of the listed chemicals. This source does not manufacture, sell, or distribute any of the listed chemicals. The source's use of listed chemicals is that in fire extinguishers, chillers, air conditioners and other HVAC equipment.
3. **Prevention of Accidental Releases 112(r):** The source does not manufacture, process, use, store, or otherwise handle one or more of the regulated substances listed in 40 CFR Part 68, Subpart F, and District Regulation 5.15, Chemical Accident Prevention Provisions, in a quantity in excess of the corresponding specified threshold amount.
4. **40 CFR Part 64 Applicability Determination:** This project and affected equipment is not major for any criteria pollutant. In accordance with 40 CFR 64, Compliance Assurance Monitoring for Major Stationary Sources, the source is not required to propose a CAM plan based on current process and control device requirements and practices.
5. **Basis of Regulation Applicability**
 - a. **Plant-wide**

The company is a major source for VOC, total HAPs, single HAPs, SO₂, CO, PM₁₀, and CO_{2e} (Greenhouse Gases). Regulation 2.16-Title V *Operating Permits* establishes requirements for major sources. Limits are given to preclude PSD/NA-NSR for VOC, SO₂, CO, PM, and PM₁₀.

Limits for Greenhouse Gases (GHG) are given to avoid the applicability of PSD.

The Company is limited to synthetic minor source emission levels of all criteria pollutants per agreed to Board Order 2142. In addition the Board Order also required that the following HAP emission limits were taken to assure that the source remains a synthetic minor source for HAPs.

- The owner or operator shall limit each single plant-wide HAP emissions to less than 10 tons per 12 consecutive month period.

- The owner or operator shall limit the total plant-wide HAP emissions to less than 25 tons per 12 consecutive month period.

Regulations 5.00, 5.01, 5.20, 5.21, 5.22, and 5.23 (STAR Program) establish requirements for environmental acceptability of toxic air contaminants (TACs) and the requirement to comply with all applicable emission standards. The TAC emissions from the combustion of natural gas are considered to be “De minimis emissions” by the District. This includes all of the emissions from a process or process equipment for which the only emissions are the products of combustion of natural gas, such as from a natural gas-fired boiler or turbine, but does not include the other emissions from a process or process equipment that are not the products of the combustion of natural gas. (Regulation 5.21, section 2.7). The source submitted their updated AERMOD air dispersion modeling on 12/21/2015, and previously submitted on 12/08/2015, and 10/16/2015 demonstrating that potential TAC emissions were either De minimis or compliant with STAR EA goals.

Regulation 2.16, sections 4.1.9.1 and 4.1.9.2 requires sufficient monitoring and record keeping to assure ongoing compliance with the terms and conditions of the permit. The owner or operator shall maintain all the required records for a minimum of 5 years and make the records readily available to the District upon request.

Regulation 2.16, section 4.3.5, requires stationary sources for which a Title V is issued shall submit an annual compliance certification by April 15. In addition, as required by Regulation 2.16, section 4.1.9.3, the source shall submit compliance reports at least every six months to show compliance with the permit. Compliance reports and compliance certifications shall be signed by a responsible official and shall include a certification statement per Regulation 2.16, section 3.5.11.

b. Permit C-0028-1003-16-V: Removal of Packed Bed Scrubber from Formaldehyde Production – Silver Process (Emission Unit U1)

i. Equipment:

Emission Point	Description	Applicable Regulation	Basis for Applicability
E1	Primary Absorber (C-001), 1970	STAR, 5.15, 7.25 40 CFR 60 Subparts VV & III ¹ ,	STAR, Regulations 5.00, 5.01, 5.02, 5.20, 5.21, 5.22, and 5.23, establishes the requirements for
E2	Secondary Absorber(C-002), 1970		

¹ Process equipment falls under Regulation 7.02 (40 CFR 60 Subpart III and Subpart VV) because of the installation of additional reactors in 1983 and 1987. The Company has chosen to demonstrate compliance with the HON MACT requirements in lieu of the requirement of 40 CFR 60 Subpart VV, and III Per 63.110(d)(10) and 63.160(c)(1).

Emission Point	Description	Applicable Regulation	Basis for Applicability
E3	Distillation Column(C-003), 1970	40 CFR 63 Subparts F, G, & H	Environmental Acceptability for TACs.
E4	Purification Column (C-004), 1970		Regulation 5.15 implements the provisions of 40 CFR Part 68
E5	Waste Heat Recovery Boiler (E-001), 1970	IA ²	Chemical Accident Prevention Provision as required by the Act, §112 (r).
E6	Methanol Process Condenser (E-004) 1970	STAR, 5.15, 7.25 40 CFR 60, Subparts VV & III ¹ 40 CFR 63 Subparts F, G, & H	Regulation 6.13 establishes the regulations for VOC storage tanks greater than 250 gallon capacity which were installed before September 1, 1976.
E7	Air Heater Chest (E-010), 1970		
E8	Methanol Feed Tank (V-001), 1970		
E9	Raw Formaldehyde Feed Tank (V-004), 1970		
E10	Product Accumulator (V-005), 1970		
E11	Reflux Accumulator (V-006), 1970	Regulation 7.12 establishes the regulations for Storage tanks with a capacity greater than 250 gallons constructed after April 19, 1972.	
E12	Oxalic Acid Tank (V-012), 1970	STAR, 5.15, 7.25 40 CFR 60, Subparts VV & III ¹ 40 CFR 63 Subparts F, G, & H	Regulation 7.22 applies to loading facilities which load more than 200 gallons of “volatile organic materials” into tank trunks, trailer, or railroad tank cars in any one day, commencing after June 13, 1979.
E13.1-E13.60	Reactors (60), 1970		
E18	Silver Plant Boiler 12.6MMBtu/hr (H-001),1970	STAR, 6.07	Regulation 7.25 establishes the requirements for VOC emissions, apply to a process not elsewhere regulated in District Regulation 7, and applies to new processes commenced after June 13, 1979.
E19	Formaldehyde Storage Tank 20616 gal (V-021), 1971	STAR, 5.15, 6.13 40 CFR 60, Subparts VV & III ¹ 40 CFR 63 Subparts F, G, & H	40 CFR 60 Subpart Kb applies to storage vessels of volatile organic liquids which have a design capacity of 19,800 gal or greater, construction commenced after July 23, 1984, and a maximum true vapor pressure 15.0 kPa or greater.
E20	Formaldehyde Storage Tank 20616 gal, (V-022), 1971		
E21	Formaldehyde Storage Tank 20616 gal, (V-023), 1971		
E22	Formaldehyde Storage Tank 20616 gal, (V-024), 1971		
E23	Formaldehyde Storage Tank 20616 gal, (V-025), 1971		
E24	Formaldehyde Storage Tank 20616 gal, (V-026), 1971	STAR, 5.15, 6.13 40 CFR 60, Subparts VV & III ¹ 40 CFR 63 Subparts F, G, & H	40 CFR 60 Subpart VV Standards of performance for equipment leaks of VOC in the synthetic organic chemicals manufacturing industry for which construction, reconstruction, or modification commenced after January 5, 1981,
E25	Formaldehyde Storage Tank 20616 gal, (V-027), 1971		
E26	Formaldehyde Storage Tank 20616 gal, (V-028), 1971		

² Waste Heat Recovery Boilers (E5) do not combust any fuel, therefore are not defined as indirect heat exchangers. Per 40 CFR 63.11237, Subpart JJJJJ, waste heat boilers are excluded from the definition of Boiler.

Emission Point	Description	Applicable Regulation	Basis for Applicability
E27	Methanol Storage Tank 750000 gal, (V-00A), 1971	STAR, 6.13 40 CFR 60, Subparts VV & III ¹ 40 CFR 63 Subparts F, G, & H	and on or before November 7, 2006 40 CFR 60 Subpart III: Standards of performance for volatile organic compound (VOC) emissions from the synthetic organic chemical manufacturing industry (SOCMI) air oxidation unit processes
E28	Formaldehyde Rail Loading Arm #7, 1990	STAR, 5.15, 7.22 40 CFR 60, Subparts VV & III ¹ 40 CFR 63 Subparts F, G, & H	40 CFR 63 Subpart F: National emission standards for organic hazardous air pollutants from the synthetic organic chemical manufacturing industry 40 CFR 63 Subpart G: National emission standards for organic hazardous air pollutants from the synthetic organic chemical manufacturing industry for process vents, storage vessels, transfer operations, and wastewater
E29	Formaldehyde Rail Loading Arm #10, 1990		
E30	Formaldehyde Rail Loading Arm #12, 1990		
E31	Formaldehyde Rail Loading Arm #14, 1990		
E32	Formaldehyde Truck Loading Bay, 1990		
E34	Formaldehyde Storage Tank 40000 gal, (V-58), 1996	STAR, 5.15, 7.12 40 CFR 60, Subpart Kb, 40 CFR 60, Subparts VV & III ¹ 40 CFR 63 Subparts F, G, & H	40 CFR 63 Subpart H: National emission standards for organic hazardous air pollutants for equipment leaks
E35	Formaldehyde Storage Tank 40000 gal, (V-59), 1996		
E37	UFC Distillate Storage Tank 25000 gal, (V-61), 1996	STAR, 5.15, 7.12 40 CFR 60, Subparts VV & III ¹ 40 CFR 63 Subparts F, G, & H	

ii. **Standards/Operating Limits**

1) **VOC**

- (a) Regulation 7.25, section 3.1 requires that best available control technology (BACT) be utilized and the owner or operator shall limit the plant-wide VOC emission for all emission points to 70 tons or less per 12 consecutive month period. The plant-wide limit includes all process equipment, storage tanks, loading racks, etc. that emit VOC³.
- (b) Regulation 7.25 applies to all affected facilities, as defined in Regulation 6.24, that were constructed before June 13, 1979 in addition to all affected facilities constructed after this date.

³ The company agreed to the VOC BACT limit being Plant-Wide in a letter dated February 16, 2007. The Plant-Wide 70 ton per 12 consecutive months VOC BACT limit replaces the production limit of 35 million pounds per year for urethane resins from the liquid resin unit (LRU).

- (c) Regulation 7.25, section 3.1 requires the owner or operator to operate and maintain the control device at all times an associated emission point is in operation, including periods of startup, shutdown, and malfunction, in a manner consistent with good air pollution control practice to meet the standards. .
- (d) Regulation 7.22 stipulates use of controls for facilities loading 20,000 gallons or more of volatile organic material.
- (e) Regulation 6.13, applies to tank E27 due to the vapor pressure as stored being greater than 1.5 psia and a tank size of 750000 gallons.
- (f) 40 CFR 60 Subpart Kb provisions do not apply since the provisions of the HON MACT do apply for this process unit.
- (g) For Storage Tank (E19, E20, E21, E22, E23, E24, E25, E26, E34, E35, and E37), Regulation 6.13 section 3.3 and 7.12 section 3.3 requires submerged fill if the materials have an as stored vapor pressure of 1.5 psia or greater.

2) **HAP**

40 CFR 63 Subparts F, G, and H regulate the emissions of HAP from the synthetic organic manufacturing industry. Although a synthetic minor source for HAP emissions the Company agreed to regulation of the two Formaldehyde production processes as part of Board Order agreement 2142.

3) **TAC**

Per Regulations 5.00 and 5.21, TAC emissions must not exceed environmentally acceptable levels.

4) **PM**

Silver Plant boiler emissions are limited in accordance with Regulation 6.07, Table 1 which allows for the interpolation of allowable emission by use of the following equation:

$$Y = 0.9634 X^{-0.2356}$$

Where:

Y = allowable particulate emissions in pounds per million BTU per hour heat input.

X = millions of BTU per hour heat input capacity rating.

5) **Opacity**

Silver Plant boiler emissions are limited in accordance with Regulation 6.07

6) **SO₂**

Silver Plant boiler emissions are limited in accordance with Regulation 6.07, Table 2 which allows for the interpolation of allowable emissions by use of the following equation for liquid or gaseous fuels:

$$Y = 7.722 X - 0.4106$$

Where:

Y = allowable sulfur dioxide emissions in pounds per million BTU per hour heat input.

X = millions of BTU per hour heat input capacity rating.

III. Other Requirements

1. Temporary Sources: The source did not request to operate any temporary facilities.

2. Short Term Activities: The source did not report any short term activities.

3. Emissions Trading: N/A

4. Operational Flexibility: The source did not request any operational flexibility for these emission points.

5. Compliance History:

Incident Date	Regulation Violated	Result
4/27/1998	1.09 0 General Prohibition of Air Pollution	Agreement
10/29/1999	2.17 03 GENERAL PROVISIONS 7.25 03 Failure to Comply with VOC limit or BACT 5.11 00 AIR TOXICS-EXISTING-EXCEEDING STANDARDS 7.25 03 SOP-NEW SOURCES USING VOC 5.11 01 SOP-EXISTING SOURCES EMITTING TAP 2.17 03 COMPLIANCE WITH PERMIT	Board Order
2/27/2003	1.13 02 ODORS-PROHIBITION	Agreement
9/1/2011	2.17 03 Failure to Comply with FEDOOP Permit 1.07 04 Failure to Report Excess Emissions	Board Order

6. Calculation Methodology: The Company uses a variety of methods to estimate air emissions. Most of the emission estimates are based on established calculation methodologies for common processes and emissions-generating activities, which are based

on EPA's AP-42. The calculation methods include:

a. **Loading and Unloading losses**

Loading and Unloading losses are determined by methods based on EPA's AP-42; Chapter 5.2 version dated January 1995.

b. **Working and Breathing losses from tanks**

Breathing losses for all major raw material storage tanks are estimated by using Tanks 4.0 which is based on Chapter 7, "Liquid Storage Tanks" from the AP-42 version dated January 1995.

c. **Fugitive losses**

Fugitive losses due to equipment leaks are monitored plant-wide which is then used to calculate emissions using the SOCFI equation set. Fugitive emissions are incorporated in unit totals.

d. **Stream testing**

Stack tests were performed to determine some control device efficiencies and emission rates. The company tested the Silver plant boiler (C6 or E18) on July 15-16, 2015.

e. **EPA emission factors**

EPA AP-42 factors are used for combustion emissions except where site-specific stack test data is available.

f. **Vendor control efficiency information**

Vendor control efficiencies are applied to estimate most of the particulate emissions.

g. **Engineering judgment**

Engineering judgment is applied to determine some emissions.

7. Insignificant Activities: Waste Heat Recovery Boilers (E5) do not combust any fuel, therefore are not defined as indirect heat exchangers. Per 40 CFR 63.11237, Subpart JJJJJ, waste heat boilers are excluded from the definition of Boiler. The boilers are classified as insignificant activities.