



Louisville Metro Air Pollution Control District
 701 West Ormsby Avenue, Suite 303
 Louisville, Kentucky 40203-3137



June 3, 2021

**Title V Construction
 Statement of Basis**

Source: Carbide Industries, LLC
 4400 Bells Lane
 Louisville, KY 40211

Owner: Carbide Industries, LLC
 4400 Bells Lane
 Louisville, KY 40211

Application Documents: See Table I-9

Draft Permit: May 01, 2021

Permitting Engineer: Shannon Hosey

Plant ID: 0001

SIC: 2869

Proposed Permit: May 01, 2021

Permit Number: C-0001-21-0002-V

NAICS: 325188

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.

This permit allows construction of a new fluidized bed coke dryer to replace the existing rotary coke dryer to dry coke in the U2 area. The company will also add other material handling equipment.

Jefferson County is classified as an attainment area for lead (Pb), nitrogen dioxide (NO₂), carbon monoxide (CO), particulate matter less than 10 microns (PM₁₀), particulate matter less than 2.5 microns (PM_{2.5}), and sulfur dioxide (SO₂). Jefferson County is classified as a nonattainment area for ozone (O₃).

Permit Application Type:

- | | | |
|------------------------------------------------------|------------------------------------------|-----------------------------------------|
| <input checked="" type="checkbox"/> Initial issuance | <input type="checkbox"/> Permit Revision | <input type="checkbox"/> Permit renewal |
| | <input type="checkbox"/> Administrative | |
| | <input type="checkbox"/> Minor | |
| | <input type="checkbox"/> Significant | |

Compliance Summary:

- | | |
|---------------------------------------------------------------------|-----------------------------------------------------------------------|
| <input checked="" 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. Product Description:

Carbide Industries, LLC manufactures calcium carbide in a semi-closed electric submerged-arc furnace.

2. Process Description:

The company receives coke and lime by both rail-car and truck. These raw materials travel through the material handling steps and the coke is dried before they are processed and reacted in a 50 MW electric-arc furnace to produce calcium carbide. The calcium carbide is then processed and packaged for sale. Waste material is reacted on-site to produce acetylene gas which is burned in a flare. The calcium hydroxide residue from acetylene production is stored in large open pits on the site. This construction permit is for the replacement of the coke dryer and related handling equipment.

3. Site Determination:

There are no other facilities that are contiguous or adjacent to this facility.

4. Emission Unit Summary:

Emission Unit	Equipment Description
U2	Coke Handling Unit – Receives coke shipments and conveys to storage

5. Equipment Being Removed:

From Emission Unit U2 the following Emission Points are being removed:

Emission Point	Equipment
009	Coke Hopper
010	Hopper Belt Conveyor
012	Coke Dryer
013	Dryer Discharge Hopper
014	Hopper Discharge Conveyor

6. Fugitive Sources:

Fugitive sources of PM are subject to APCD Regulation 1.14.

7. Permit Revisions:

Permit No.	Public Notice Date	Issue Date	Change Type	Description/Scope
C-0001-21-0002-V	05/01/2021	06/03/2021	Initial	Replace the existing rotary coke dryer in the U2 area with a new fluidized bed coke dryer

8. Application and Related Documents

Document Number	Date	Description
181811	01/11/2021	Construction Application to replace the existing rotary coke dryer in the U2 area with a new fluidized bed coke dryer
186847	01/12/2021	Potential emissions calculations
190225	02/15/2021	Application deficiency letter from APCD
201186	03/17/2021	Revised Construction Application
201729	03/17/2021	Revised potential emissions calculations
210586	04/09/2021	NO _x and SO ₂ Demonstrations

9. Construction Emission Summary

Pollutant	District Calculated Potential Controlled Emissions (tpy) ¹	Pollutant that triggered Major Source Status (based on PTE)
CO	10.09	No
NO _x	3.23	No
SO ₂	7.5	No
PM	40.41	Yes
PM ₁₀	20.61	Yes
PM _{2.5}	6.07	Yes
VOC	0.037	No
Total HAPs	0.013	No
Single HAP > 1 tpy	All individual HAPs < 1 tpy	No

¹ Emissions shown in this table represent emissions limited at a wet coke processing rate of 84,000 tons/year.

10. Applicable Requirements

- | | | |
|------------------------------------|-----------------------------------------------------|------------------------------------|
| <input type="checkbox"/> 40 CFR 60 | <input checked="" type="checkbox"/> SIP | <input type="checkbox"/> 40 CFR 63 |
| <input type="checkbox"/> 40 CFR 61 | <input checked="" type="checkbox"/> District Origin | <input type="checkbox"/> Other |

11. Referenced Federal Regulations:

This project has no federal requirements.

12. Non-Applicable Regulations:

The company has requested an annual processing rate limitation for wet coke of 84,000 tons per year. The limit precludes the applicability of PSD. Therefore, Regulation 2.04 – Construction or Modification of Major Sources in or Impacting up Non-Attainment Areas (Emission Offset Requirements) and Regulation 2.05 – *Prevention of Significant Deterioration of Air Quality* are not applicable.

II Regulatory Analysis

1. Acid Rain Requirements:

Carbide Industries, LLC 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. Carbide Industries, LLC 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):

Carbide Industries, LLC 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:

Carbide Industries, LLC is not subject to 40 CFR Part 64 - *Compliance Assurance Monitoring*.

5. Basis of Regulation Applicability

a. Applicable Regulations

Regulation	Title	Basis
1.14	Control of Fugitive Particulate Emissions	This regulation provides for the control of fugitive particulate emissions.
6.09	Standards of Performance for Existing Process Operations	Applies to each process operation that is not otherwise regulated by any other portion of Regulation 6 and was in existence or had a construction permit issued by the District by September 1, 1976
7.08	Standards of Performance for Existing Process Operations	Applies to equipment installed after September 1, 1976 subject to the PM emission standard
7.09	Standards of Performance for New Process Gas Streams	Provides for the control of emissions in new process gas streams.

b. Plantwide

- i. Carbide Industries, LLC is a major source for VOC, CO and PM₁₀. Regulation 2.16 - *Title V Operating Permits* establishes requirements for major sources. Carbide Industries, LLC has requested an annual processing rate limitation for wet coke of 84,000 tons per year to not be a PSD major source.
- ii. Regulation 2.03, section 6.1 requires sufficient monitoring, record keeping, and reporting 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.

c. Emission Unit U2 – Coke Handling Unit

EP	Description	Applicable Regulations	Control ID
E008	Coke Ground Pile and Haul Roads (Frontend Loader Movement)	1.14	NA
E016	Coke Screen	7.08	NA
E017	Pneumatic Transfer System	7.08	NA
E018	Fines Storage Bin	7.08	BV2 – Bin vent (Coke fines storage)
E019	85 Ton East Storage Bin	7.08	C2 – F2 Baghouse - (Amerex) 45,000 ft ³ /min ΔP = 4 - 10 in. water, Rebuilt March 2013
E020	85 Ton West Storage Bin	7.08	

EP	Description	Applicable Regulations	Control ID
E021	Fines Truck Loading Station	7.08	NA
E022	Fines Weigh Belt for Coke	7.08	C1 – F1 Baghouse - (R.L.Flowers) 12,000 ft ³ /min ΔP = 4 - 8 in. water
E023	East Bin Weigh Belt	6.09	
E024	West Bin Weigh Belt	6.09	
E009N	Hoppers 1, 2, 3 (Iron City Conveyors LLC) - Hopper Loading	7.08	NA
E010N	Hopper Collection Conveyor (Iron City Conveyors LLC) – Transfer from Hopper to Conveyor	7.08	NA
E011N	Hopper Transfer Conveyor (Iron City Conveyors LLC) – Transfer from Conveyor to Conveyor	7.08	NA
E012N	Fluidized Bed Coke Dryer (Carrier Vibrating Equipment, Inc.), 24 MMBTU/hr, fueled by natural gas and off-gas	7.08, 7.09	C2 – F2 Baghouse - (Amerex) 45,000 ft ³ /min ΔP = 4 - 10 in. water, Rebuilt March 2013
E013N	Dryer Outlet Chute/Hopper (Carrier Vibrating Equipment, Inc.) – Transfer from Dryer to Hopper	7.08	
E014N	Dried Coke Vibrating Conveyer (Carrier Vibrating Equipment, Inc.) – Transfer from Hopper to Conveyer	7.08	
E015	Bucket Elevator – Transfer from Conveyer to Elevator	6.09	

i. Standards

(1) CO

Regulation 7.09, Section 5 establishes CO emission limits for process gas streams.

(2) NO_x

Regulation 7.08, Section 4 establishes NO_x standards.

(3) Opacity

Regulation 6.09, section 3.1 and Regulation 7.08, section 3.1.1 establishes an opacity standard of less than 20%.

- (4) PM/PM₁₀/PM_{2.5}
 - (a) Regulation 1.14 sets forth emission standards and required control measures for fugitive emissions.
 - (b) Regulation 6.09, Table 1, PM standards are determined by the following equation:
$$E = 4.10(P)^{0.67}$$
 - (c) Regulation 7.08, Table 1, PM standards are determined by the following equation:
$$E = 3.59(P)^{0.62}$$
- (5) SO₂

Regulation 7.09, section 4 establishes SO₂ emission limits for process gas streams.

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:

The source is not subject to emission trading.

4. Alternative Operating Scenarios:

The source did not request any alternative operating scenarios.

5. Compliance History:

There are no records of any violations of the terms of the present or prior construction or operating permits.

6. Calculation Methodology or Other Approved Method:

The emission calculations for the various pieces of equipment are derived from stack test results, AP-42 emission factors, EPA guidance documents, mass balances and engineering judgments.