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**DATE** June 22, 2023

**SUBJECT** Review of RACT III Proposal  
GrafTech USA, LLC  
City of St Marys, Elk County  
TVOP 24-00012

## **INTRODUCTION**

The Department received GrafTech USA, LLC's (GrafTech) RACT III proposal, dated December 21, 2022, concerning RACT III compliance. GrafTech's TV facility is located in the City of Saint Marys, Elk County. The facility manufactures carbon products and electrodes. The facility is a major emitter of VOCs and subject to RACT III. They are not major for NO<sub>x</sub>.

As part of the Reasonably Available Control Technology (RACT) regulations codified at 25 Pa. Code §§ 129.111—129.115 (relating to additional RACT requirements for major sources of NO<sub>x</sub> and VOCs for the 2015 ozone NAAQS) (RACT III), the Pennsylvania Department of Environmental Protection (Department) has established a method under § 129.114(i) (relating to alternative RACT proposal and petition for alternative compliance schedule) for an applicant to demonstrate that the alternative RACT compliance requirements incorporated under § 129.99 (relating to alternative RACT proposal and petition for alternative compliance schedule) (RACT II) for a source that commenced operation on or before October 24, 2016, and which remain in force in the applicable operating permit continue to be RACT under RACT III as long as no modifications or changes were made to the source after October 24, 2016. The date of October 24, 2016, is the date specified in § 129.99(i)(1) by which written RACT proposals to address the 1997 and 2008 8-hour ozone National Ambient Air Quality Standards (NAAQS) were due to the Department or the appropriate approved local air pollution control agency from the owner or operator of an air contamination source located at a major NO<sub>x</sub> emitting facility or a major VOC emitting facility subject to § 129.96(a) or (b) (relating to applicability).

The procedures to demonstrate that RACT II is RACT III are specified in § 129.114(i)(1)(i), 129.114(i)(1)(ii) and 129.114(i)(2), that is, subsection (i), paragraphs (1) and (2). An applicant may submit an analysis, certified by the responsible official, that the RACT II permit requirements remain RACT for RACT III by following the procedures established under subsection (i), paragraphs (1) and (2).

Paragraph (1) establishes cost effectiveness thresholds of \$7,500 per ton of NO<sub>x</sub> emissions reduced and \$12,000 per ton of VOC emissions reduced as “screening level values” to determine the amount of analysis and due diligence that the applicant shall perform if there is no new pollutant specific air cleaning device, air pollution control technology or technique available at the time of submittal of the analysis. Paragraph (1) has two subparagraphs.

Subparagraph (i) under paragraph (1) specifies that the applicant that evaluates and determines that there is no new pollutant specific air cleaning device, air pollution control technology or technique available at the time of submittal of the analysis and that each technically feasible air cleaning device, air pollution control technology or technique evaluated for the alternative RACT requirement or RACT emission limitation approved by the Department (or appropriate approved local air pollution control agency) under § 129.99(e) had a cost effectiveness equal to or greater than \$7,500 per ton of NO<sub>x</sub> emissions reduced or \$12,000 per ton of VOC emissions reduced shall include the following information in the analysis:

- A statement that explains how the owner or operator determined that there is no new pollutant specific air cleaning device, air pollution control technology or technique available.
- A list of the technically feasible air cleaning devices, air pollution control technologies or techniques previously evaluated under RACT II.
- A summary of the economic feasibility analysis performed for each technically feasible air cleaning device, air pollution control technology or technique in the previous bullet and the cost effectiveness of each technically feasible air cleaning device, air pollution control technology or technique as submitted previously under RACT II.
- A statement that an evaluation of each economic feasibility analysis summarized in the previous bullet demonstrates that the cost effectiveness remains equal to or greater than \$7,500 per ton of NO<sub>x</sub> emissions reduced or \$12,000 per ton of VOC emissions reduced.

Subparagraph (ii) under paragraph (1) specifies that the applicant that evaluates and determines that there is no new pollutant specific air cleaning device, air pollution control technology or technique available at the time of submittal of the analysis and that each technically feasible air cleaning device, air pollution control technology or technique evaluated for the alternative RACT requirement or RACT emission limitation approved by the Department (or appropriate approved local air pollution control agency) under § 129.99(e) had a cost effectiveness less than \$7,500 per ton of NO<sub>x</sub> emissions reduced or \$12,000 per ton of VOC emissions reduced shall include the following information in the analysis:

- A statement that explains how the owner or operator determined that there is no new pollutant specific air cleaning device, air pollution control technology or technique available.

- A list of the technically feasible air cleaning devices, air pollution control technologies or techniques previously evaluated under RACT II.
- A summary of the economic feasibility analysis performed for each technically feasible air cleaning device, air pollution control technology or technique in the previous bullet and the cost effectiveness of each technically feasible air cleaning device, air pollution control technology or technique as submitted previously under RACT II.
- A statement that an evaluation of each economic feasibility analysis summarized in the previous bullet demonstrates that the cost effectiveness remains less than \$7,500 per ton of NO<sub>x</sub> emissions reduced or \$12,000 per ton of VOC emissions reduced.
- A new economic feasibility analysis for each technically feasible air cleaning device, air pollution control technology or technique.

Paragraph (2) establishes the procedures that the applicant that evaluates and determines that there is a new or upgraded pollutant specific air cleaning device, air pollution control technology or technique available at the time of submittal of the analysis shall follow.

- Perform a technical feasibility analysis and an economic feasibility analysis in accordance with § 129.92(b) (relating to RACT proposal requirements).
- Submit that analysis to the Department (or appropriate approved local air pollution control agency) for review and approval.

The applicant shall also provide additional information requested by the Department (or appropriate approved local air pollution control agency) that may be necessary for the evaluation of the analysis submitted under § 129.114(i).

## **BACKGROUND**

GrafTech produces various carbon products, primarily electrodes. The products themselves are used in various industrial processes, typically in steelmaking electric arc furnaces. GrafTech's production process can be summarized as follows: 1. Milling, mixing, and extrusion of coke/tar pitch into cylinder-shaped green electrodes; 2. Baking of electrodes (to carbonize the pitch); 3. Impregnation of coal tar into the porous electrode, and re-baking; 4. Graphitizing of electrodes to convert the baked carbon to graphite; and 5. Cleaning, inspection, and machining of graphitized electrode products.

The baking of carbon products throughout their manufacture generates primarily VOCs. GrafTech's Saint Marys facility is a major emitter of VOCs exclusively, this obligates them to address RACT III for VOC sources at the facility.

This RACT III proposal addresses one source which was modified after the RACT II applicability date of October 24, 2016. Source 187 (Longitudinal Graphitizers) was modified during 2021; however, the source was subject to RACT II before that date and remains subject to RACT III. Additionally, the change affected SO<sub>2</sub> emissions and not VOC emissions. No changes affected previous RACT determinations and the source can be considered un-modified for RACT III purposes.

## ANALYSIS

The RACT III proposal received on or about December 21, 2022 correctly addresses all sources from the RACT II determination approved by EPA on January 24, 2022. A list of the sources reviewed under RACT III are provided below and their status summarized.

Only Sources 186 & 187 required a Case by Case analysis under RACT II; this also holds true for RACT III.

Source 186 Carbottom furnaces are already controlled by 2 thermal oxidizers. The RACT III analysis yielded no other technically feasible alternatives/new treatment technologies, and the facility has concluded RACT II = RACT III, and will continue operating the existing thermal oxidizers. The existing PTE for this source is 89.6 tpy, and this is an existing emission limit in the TVOP, as a 12-month rolling average.

Source 187 Longitudinal Graphitizing Furnaces are currently uncontrolled and have a PTE of ~ 20 tpy, which is included as an emission limit in the current TVOP, as a 12-month rolling average. The RACT III analysis states GrafTech does not believe any add-on controls are technically feasible, due to the nature of the variable VOCs emitted (highly intermittent VOC concentrations & flows). They believe the idea of a new thermal oxidizer would represent significant design & operational challenges. Nevertheless, they did an economic analysis for a new thermal oxidizer, and it yielded > \$12,000 per ton of VOC removed, making it not cost-effective as RACT III for this source, anyway. The facility has concluded RACT II = RACT III for this source.

The Department has reviewed the applicant's determination that no new control technologies exist for the reduction of VOC from Source 186 & 187, since the RACT II analysis was completed. Information for this analysis was obtained from (1) the RACT/BACT/LAER Clearinghouse Database (RBLC database); (2) engineering judgement; (3) Surveying regulatory agencies; (4) Surveying air pollution control equipment vendors, and (5) Surveying available literature.

The RACT II determination/requirements can be found in the attached RACT II review memo and at the following link: [EPA Approved Pennsylvania Source-Specific Requirements | US EPA \(https://www.epa.gov/sips-pa/epa-approved-pennsylvania-source-specific-requirements\)](https://www.epa.gov/sips-pa/epa-approved-pennsylvania-source-specific-requirements)

Summary of Sources and RACT III Applicability

Source ID	Source Name	RACT III Category	RACT III Determination and Provision
108	Pitch Impregnation	Exempt	-
128	Cummins Natural Gas Emergency Generator	Exempt	-
130	Diesel Emergency Generator	Exempt	-
151	PI Basket Burners/Burn-off Oven	Presumptive	-

162	Liquid Pitch Storage (PI) & Dist.	Exempt	-
163	Air/Vegetable Oil Quench System	Exempt	-
186	Carbottom Furnaces	Case-by-case	Existing Controls/No other controls technically feasible
187	Longitudinal Graphitizing Furnaces	Case-by-case	No Additional/New Controls, § 129.114(i)(2)
203	Parts Cleaners	Exempt	-
N/A	Miscellaneous Heaters	Exempt	-

Summary Table of proposed RACT II = RACT III for Sources 186 & 187 is below.

**Table 3-1. St. Marys Facility Proposed RACT Summary**

<b>Emission Source ID(s):</b>	186, Carbottom Furnaces
<b>Source Description(s):</b>	Sixteen (16) Natural gas-fired Carbottom Furnaces, 10 MMscf/hr
<b>Description of RACT:</b>	Case-by-case Thermal Oxidization
<p><b>Proposed Limit:</b> 1.49 lbs VOC per ton of carbon baked (89.6 tpy). Maintain and operate the source and control device in accordance with manufacturer’s specifications and good air pollution control practices.</p> <p><b>Monitoring:</b> Continuous Monitoring of TO Inlet and Outlet Temperature. Maintain inlet TO temperature of 1500 °F or greater.</p> <p><b>Proposed Testing:</b> Calibrate and check the accuracy of temperature indicator annually.</p> <p><b>Proposed Recordkeeping:</b> Keep TO temperature records for five (5) years. Maintain a record of all preventative maintenance inspections of the control device. Maintain a record of pounds of VOC emitted per tons of carbon baked.</p> <p><b>Proposed Reporting:</b> Semi-annual Title V reporting and annual compliance certification</p>	

<b>Emission Source ID(s):</b>	187, Longitudinal Graphitizers
<b>Source Description(s):</b>	Twenty (20) electric graphitizers
<b>Description of RACT:</b>	Case-by-case Good Air Pollution Control Practices
<p><b>Proposed Limit:</b> 24.49 lbs VOC per ton of carbon graphitized. Maintain and operate the source in accordance with manufacturer’s specifications and good air pollution control practices.</p> <p><b>Monitoring:</b> Monitor Certificates of Analysis (COA’s) from raw material vendors to verify volatile material content remains below 3%.</p> <p><b>Proposed Testing:</b> No additional testing proposed.</p> <p><b>Proposed Recordkeeping:</b> Maintain a record of pounds of VOC emitted per tons of carbon graphitized. Maintain records of COA’s from vendors.</p> <p><b>Proposed Reporting:</b> Semi-annual Title V reporting and annual compliance certification</p>	

The Department had no discussions with the EPA, the facility representatives, or the public regarding this 'RACT II is RACT III' proposal after the facility submitted the December 2022 RACT III analysis and application.

## **CONCLUSION**

The Department has analyzed the owner/operator's proposal for considering RACT II requirements as RACT III and also performed independent analysis. Based on the information provided by the applicant or owner/operator of the facility and independently verified by the Department, the Department determines that the RACT II requirements satisfy the RACT III requirements for Sources 186 & 187. The RACT III requirements are identical to the RACT II requirements and are as stringent as RACT II.

### **Attachments:**

- February 21, 2019 RACT II Review Memo, GrafTech USA, LLC, Saint Marys Facility