pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH of PENNSYLVANIA
November 8, 2023

SUBJECT: RACT II Equals RACT III Review Memo
Jeraco Enterprises Inc.
Borough of Milton, Northumberland County
TVOP 49-00014
PFID 493221

TO: Muhammad Q. Zaman MQZ
Environmental Program Manager
Air Quality Program

THROUGH: David M. Shimmel, P.E.
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Procedural History

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 nitrogen oxides (NOx) and volatile organic compounds 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 NOx 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 NOx 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 NOx 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 NOx 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_x 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_x 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).

Facility Details

Jeraco Enterprises, Inc. is a manufacturer of truck caps and bed covers for all makes and models of pickup trucks. The facility manufactures both fiberglass and aluminum framed caps and bed covers and builds a variety of sizes and capacities.

The facility is major for VOCs only. The Department received the facility's RACT III Notification on December 30, 2022. The facility last received a full compliance evaluation on September 15, 2023, with no violations noted.

The only source subject to a RACT II as RACT III analysis at this facility is Source ID 101A which is the Spray-on Lay Up Operation consisting of a partially enclosed spray booth in which non-atomizing spray guns are used for resin application. The materials used are styrene containing resins of which Styrene is a VOC. No modification or changes were made to any affected sources after October 24, 2016. Of the three applicable regulatory sections of RACT III, namely, §129.114(i)(1)(i), §129.114(i)(1)(ii), and §129.114(i)(2), §129.114(i)(1)(i) was utilized.

The Jeraco RACT II revised permit was approved by the US EPA and said approval was incorporated into the PA SIP and published accordingly on October 16, 2020. Please see the *Federal Register 85 FR65706* for publication of the approval and incorporation into the PA SIP.

Sources subject to § 129.114(i) - RACT II determination assures compliance with RACT III requirements

Source ID	Source Name	RACT III provision
101A	Resin Spray-on Lay Up Operation	§129.114(i)(1)(i)

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

RACT II analysis performed by the Company

Jeraco has proposed that RACT II satisfies the requirements of RACT III since there have been no changes or modifications to the facility or the remaining affected sources.

To satisfy the proposal, Jeraco did a refresh on their RACT II analysis for the control of VOC emissions from the Spray-on Lay Up Operation (Source ID 101A). As with RACT II they evaluated numerous control technologies for technical feasibility. These included absorption, adsorption (scrubber), biofiltration, thermal oxidation and other "innovative" control technologies. Two technologies were deemed technically feasible.

The table below summarizes the cost control of the feasible RACT methods evaluated.

Source ID	Source Name	Control Technology	VOC Emissions before Control	VOC Emissions after Control	Total Annual Cost of Control Eqpt	VOC ($/Ton) Removal Cost
101A	Resin Spray-on Lay Up Operation	Regenerative Thermal Oxidation	50.2	1.0	$614,619	$12,492
		Recuperative Thermal Oxidation	50.2	1.0	> Above	> Above

Company's RACT II equals RACT III Analysis

Jeraco notes that the primary VOC for their process is styrene, which has very low solubility in water. Absorption, or scrubbers, rely on the controlled VOC being highly soluble in water. Consequently, they contend capture rate would be dismal and overall system efficiency would be very low. As a result, much of the styrene would still be emitted to atmosphere. Even with a scrubber, the problem remains on how to treat the water that is laden with styrene. Therefore absorption (scrubbers) was viewed technically infeasible.

Adsorption involves a transfer of the VOC to the surface of an adsorbent material like activated carbon, or zeolite, silica or other materials or substances. Jeraco reports that the capture efficiencies vary for the adsorbent media, but the real problem comes with disposal, treatment or regeneration of the adsorbing media. Recovery of styrene from the adsorbent was evaluated by Jeraco but because suppliers do not use recycled styrene to produce their saleable product, end use for recovered styrene isn't available. The styrene resulting from media regeneration therefore needs disposed or destroyed. This extra step is available in other technologies so

adsorption adds complexity and cost to a process that, depending on the media, will not yield capture efficiencies as high as other technologies. Consequently, adsorption was ruled out as feasible.

Biofiltration relies on the biological digestion of the VOC by living microbes. Jeraco states that the drawback to biofiltration is that it works with high effectiveness in VOCs with high water solubility. As noted above, styrene is not highly soluble. To make biofiltration work would require extremely exorbitant use of water to ensure sufficient solubility of styrene content was achieved and the effectiveness would not be assured. (The Department's experience with bio-digestion in other systems has shown that these processes are complex and require skill to manage). All these taken together resulted in Jeraco ruling out the technical practicability and feasibility of biofiltration.

Jeraco evaluated thermal oxidation, focusing on thermal and catalytic oxidation with and without heat recovery incorporated into the processes. Jeraco ruled out catalytic oxidation due to the unpredictability of the life of the catalyst due to deactivation processes, i.e., the reduction of the effectiveness of the catalyst due to deterioration of the catalyst substrate as well as the "poisoning" of the substrate caused by compounds passing over the catalyst. Jeraco cited the real-world experience of a nationally known reinforced plastic composite manufacturer whose thermal catalytic oxidizer suffered short-term degradation and poisoning resulting in the company having to replace a catalytic system with a thermal oxidation system. Additional problems potentially associated with catalytic oxidation in the Jeraco process is the plugging of the catalyst due to foreign materials in the air stream and large droplet aerosols being entrained into the air stream. Due to this, pre-filtration of the exhaust stream is needed, which only adds cost and complexity. In light of these above factors, Jeraco cited technical infeasibility due to inappropriate application of this technology to their manufacturing process sector.

Jeraco looked at "innovative" technologies (which, to the Department, were not unknown). Condensation was evaluated but was ruled out because the Jeraco high exhaust flow rate needed for proper entrainment would result in low concentration levels of styrene. They cited EPA guidance stating that condensation works best with lower flows and higher concentrations. The Department confirms these criteria based on review of other proposals involving condensation.

Jeraco also looked at an enclosed flare as a means for control. The conclusion was that a flare would not be suitable due to the very low Btu value of the exhaust stream (~1.0 Btu per cu.ft). Consequently, the flare would require an excessive amount of supplemental natural gas-firing to support safe combustion. Consequently, the addition of excessive natural gas combustion to support combustion would create additional significant pollutants. Therefore, the technology was judged as impractical and ineffective and therefore infeasible.

Jeraco then evaluated thermal oxidation with energy capture, both regenerative and recuperative. These technologies were determined to be the most reasonable and practical from a technical standpoint. Jeraco's 2017 RACT II analysis then followed up with a cost analysis using data from a US EPA Fact Sheet. Jeraco showed an annualized cost of $12,492 per ton of VOC removal/reduction for regenerative thermal oxidizer at 98% removal efficiency. This cost analysis also utilized the lower bound EPA cost metrics for regenerative thermal oxidization

systems. Their approach in 2017 yields a cost that is above the RACT III $12,000 screening threshold. Jeraco then cited the economic infeasibility of recuperative thermal oxidizer due to the cost of such systems being greater than regenerative systems.

As noted above, Jeraco did a refresh of their analysis of other control methods previously determined technically infeasible. Their analysis indicates that nothing about those approaches and technologies has changed since their RACT II analysis in 2017 that now makes them feasible. They also referred to the fact that the MACT for Reinforced Plastic Composites recognizes the cost prohibitive nature of controls for most manufacturers in the industry.

Department's Independent Analysis

The Department also performed an independent analysis which included, the Department's continuous review of permit applications since the applicability date of RACT II, control technology internet searches, RACT/BACT/LAER Clearinghouse search, combined with the knowledge gained from the Department permitting staff participating in technical presentations by several vendors and manufacturers of pollution control technology, along with a review of EPA and MARAMA's documents. Based on our review of these sources and documents, along with training and the expertise of the reviewing staff, the Department concludes that presently there are no new or updated air pollution control technologies available for the sources found at Jeraco. The Department has determined that RACT II requirements for sources P101, P103, P104 and P105 at Jeraco listed in the preceding tables ensures compliance with requirement for RACT III for 25 Pa. Code §§ 129.111 - 129.115.

Public Discussion

No discussions occurred with the EPA, the company, or the public beyond the initial application, which materially impacted a decision to include one or more sources under the RACT II is RACT III umbrella.

Conclusion

The Department has analyzed the applicant's proposal for considering RACT II requirements as RACT III and also performed independent analysis. Based on the information provided by the applicant and independently verified by the Department, the Department determines that the RACT II requirements satisfy the RACT III requirements. The RACT III requirements are identical to the RACT II requirements and are as stringent as RACT II.

File: Jeraco Enterprises, Inc., Permits, TVOP, 49-00014
Cc: Central Office, Air Quality Permits
US EPA Region III