pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

MEMO

TO James D. Rebarchak 8/9/2023
Regional Air Quality Manager
Southeast Regional Office

FROM Gary Walls
Engineering Specialist
New Source Review Section
GW

THRU James A. Beach, P.E.
Environmental Engineer Manager
New Source Review Section
JAB
8/9/2023

DATE August 3, 2023

RE 25 Pa. Code § 129.114(i) Analysis – Alternative RACT Proposal
Monroe Energy, LLC
Title V Operating Permit No. 23-00003
Trainer Borough, Delaware County
APS ID #786636, AUTH ID #1421281

Procedural History

As part of the RACT regulations codified at 25 Pa. Code §§ 129.111—129.115 (relating to additional RACT requirements for major sources of NO_x and VOCs for the 2015 ozone NAAQS) (RACT III), PA DEP has established a method under 25 Pa. Code § 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 25 Pa. Code § 129.99 (relating to alternative RACT proposal and petition for alternative compliance schedule) (RACT II) that are currently in force in the applicable operating permit continue to be RACT under RACT III.

The procedures to demonstrate that RACT II equals RACT III are specified in 25 Pa. Code §§ 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_x 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 25 Pa. Code § 129.99(e) had a cost effectiveness equal to or greater 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 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 25 Pa. Code § 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 25 Pa. Code § 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 25 Pa. Code § 129.114(i).

Brief Facility Description and Emission Sources evaluated under 25 Pa. Code §§ 129.114(i)(1)(i), 129.114(i)(1)(ii) and 129.114(i)(2)

Monroe Refinery, LLC (MONROE) owns and operates a petroleum refinery located on the Delaware River in the Borough of Trainer, Delaware County, Pennsylvania. The air emission sources at the refinery are regulated under PADEP TVOP No. 23-00003. The MONROE refinery is a major NOx and VOC emitting facility that commenced operations before August 3, 2018; therefore, MONROE must comply with the RACT regulations codified at 25 Pa. Code §§ 129.111—129.115 (RACT III). MONROE submitted the Alternative RACT Compliance Analysis in accordance with 25 Pa. Code § 129.114(i) on December 22, 2022 as part of demonstrating compliance with RACT III. The current compliance status of the refinery is important in navigating new compliance/permitting activity and, at this time MONROE does not have any existing open-air compliance violations. A full compliance inspection was last performed on November 4, 2019.

MONROE used the procedures in accordance with 25 Pa. Code § 129.114(i)(1)(i) to demonstrate that RACT II equals RACT III for the emission sources listed in Table 1. The procedures listed under 25 Pa. Code §§ 129.114(i)(1)(ii) and 129.114(i)(2) did not apply to any of the emission sources at MONROE.

Table 1 - Emission Sources and Pollutant Evaluated Under 25 Pa. Code § 129.114(i)(1)(i)

Source ID	Source Name	Pollutant of Concern
101	Fluid Catalytic Cracking Unit (FCCU)	VOC
104	Marine Vessel Ballasting	VOC
105	Marine Vessel Loading	VOC
111[1]	Cooling Towers	VOC
118	Railcar Loading LPG & Butane	VOC
735[2]	Kerosene/HCN HTU Heater	NO_x
736[2]	Diesel HTU Heater	NO_x

[1] Source ID 700 Heat Exchange was included in RACT II with Source ID 111.

[2] Process heaters with a rated heat input greater than 20 MMBtu/hr but less than 50 MMBtu/hr were evaluated under the case-by-case RACT requirements under RACT II. These emission sources now have presumptive RACT requirements under RACT III. MONROE's RACT II is more stringent than the RACT III requirements since tune-up and inspections are annual versus biennial; therefore, the RACT II requirements will remain.

RACT III Analysis for NO_x and VOC applicability

With the exception of the Back-Up Flare[3] (Source ID 122), which was removed from service, and changes to the requirements of heat exchangers under 40 C.F.R. Part 63, Subpart CC (National Emission Standards for Hazardous Air Pollutants From Petroleum Refineries) (Subpart CC), there were no other changes, physical or operational, to the emission sources addressed in this evaluation; therefore, there were no changes to the potential to emit for each source.

Summary of RACT requirements for each source

The redacted Significant Modification[4] issued under Authorization ID 1156874 provides a simple format to review all of the RACT II conditions. As previously mention Source ID 122 is no longer in service and was removed from the operating permit. In addition, as a result of revisions to Subpart CC, Conditions #001, #003 and #004 were modified and Condition #008 language was incorporated into Condition #001 and Condition #008 was deleted for Source ID 700 (Heat Exchange Systems). Nevertheless, RACT II continues to be RACT for RACT III. A plain language summary of the RACT III conditions is presented in Appendix 1.

RACT II as RACT III

MONROE has stated in the Notification of RACT III Applicability [25 Pa. Code § 129.115(a) and Alternative RACT Compliance Analysis [§ 129.114(i)] memo dated December 22, 2023, that they reviewed entries from the RACT/Best Available Control Technology (BACT)/Lowest Achievable Emissions Rate (LAER) Clearinghouse (RBLC) to determine if any new pollutant specific air cleaning device, air pollution control technology or technique were available that could be applied to the emission sources identified in Table 1 of this document. The review by MONROE did not yield any new pollutant specific air cleaning device, air pollution control technology or technique that could be applied to the emission sources identified in Table 1.

DEP performed a review of the RBLC database, Texas Commission on Environmental Quality (TCEQ) historical BACT and current BACT sites and queries of the internet in search of new pollutant specific air cleaning device, air pollution control technology or technique that could be applied to the emission sources. DEP concurs with the findings that there is no new air cleaning device, air pollution control technology or technique that could be applied to the emission sources in Table 1.

A list of the technically feasible air cleaning devices, air pollution control technologies or techniques previously evaluated under RACT II by MONROE and the associated cost effectiveness, based on the economic feasibility analysis, for the technically feasible options is presented in Table 2.

[3] The Back-Up Flare was previously used to support the Main Flare (Source ID 103). The control options for the Railcar Loading LPG & Butane (Source ID 118) source was described as venting to the Main Flare or Back-Up Flare.

[4] EPA-RO3-OAR-2021-380-0002_attachment_11.pdf, pp 524-552

Table 2 – RACT II Technically Feasible Control Options and Cost Effectiveness

Source ID	Source Name	Control	NOx ($/Ton)	VOC ($/Ton)
101	FCCU	Good operation practices		N/A[5]
		Thermal Oxidizer (CO Boiler)		
104	Marine Vessel Ballasting	Good Operating Practices		N/A[6]
105	Marine Vessel Loading	Good Operating Practices		N/A[7]
		MVR System with Vapor Combustion[8]		
111	Cooling Towers	Good Operating Practices		N/A[9]
118	Railcar Loading LPG & Butane	Good Operating Practices		N/A[10]
		Vapor Combustion		
735	Kerosene/HCN HTU Heater	Good Operating Practices	N/A[11]	
735	Kerosene/HCN HTU Heater	SCR	15,300	
735	Kerosene/HCN HTU Heater	LNB	12,001	
735	Kerosene/HCN HTU Heater	UNLB	8,535	
735	Kerosene/HCN HTU Heater	FGR+LNB[12]	12,479	
736	Diesel HTU Heater	Good Operating Practices	N/A[15]	
736	Diesel HTU Heater	LNB	8,398	
736	Diesel HTU Heater	UNLB	10,541	

An evaluation of each economic feasibility analysis summarized in the table above 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 for the emission sources and the pollutants identified in this analysis.

The analysis presented by MONROE and validated by DEP provides the basis that the RACT II requirements are being certified as continuing to be RACT, that RACT III requirements are identical to RACT II and therefore are as stringent as RACT II.

[5] The source currently uses the top identified control technology for VOC emissions for FCC Unit which is thermal oxidation and good operating practices.
[6] RACT for the source continued the requirement that 98% of the total volume of receipts of crude oil and gasoline during each calendar year be delivered to the refinery in vessels which do not ballast, such as barges, or in vessels which do not emit VOC when ballasted, such as tankers using SBT.
[7] The source currently uses all of the identified feasible control technologies.
[8] In RACT II, MONROE presented the control option MVR System with Vapor Combustion to represent the marine vapor recovery system and all potential combustion options (destruction through use of combustor, flare, or thermal oxidizer or reuse by adding to the refinery's fuel gas system). This approach limited the control options to one of two options (the other was good operating practices) for VOC control and no cost effectiveness evaluation was performed. DEP acknowledges that a cost effectiveness analysis should have been performed in RACT II; however, since the refinery uses the waste gas stream as a component of the refinery fuel gas and other control options would yield additional emissions from the source as well as higher operating costs, as well as the economic benefit of capturing the waste stream and using it in the refinery's fuel gas system, there is no need to perform that analysis as the same conclusion would be reached.
[9] The only technically feasible control technology for the source is good operating practices.
[10] The source currently uses the top identified control technology.
[11] The RACT II analysis did not present a control cost evaluation since the refinery uses good operating practices for the process heaters.
[12] Identified as FGR in the RACT II analysis.

cc: SERO, 23-00003
XXXXXX District

APPENDIX 1

RACT III - Plain Language Summary

Source ID	Pollutant of Concern	Plan Language RACT II Summary [13]
101	VOC	• Use of the CO boiler • Operating of control devices in accordance with manufacturer specs and good air pollution control practices • VOC limit of 8.1 tpy calculated as a 12-month rolling sum • Relevant recordkeeping related to the limits such as combustion rates and hours of operation
104	VOC	• At least 98% of the total volume of receipts of crude oil and gasoline during each calendar year shall be delivered to the facility in vessels which do not ballast, such as barges, or in vessels which do not emit VOCs when ballasted, such as tankers using segregated ballast tanks • VOC limit 9.2 tons 12-month rolling sum • Recordkeeping of crude or gasoline received at the facility including delivery dates, cargo type and amount, ballast tank type, and percent total volume of receipt delivered in non-ballasting or VOC emitting vessels
105	VOC	• Use of marine vapor recovery device to reduce VOCs by at least 98% by weight and route to the fuel gas system • Monitoring and recordkeeping of gasoline loading and monthly emissions
111 and 700	VOC	• Good operating practices, defined as compliance with the applicable monitoring, work practice, reporting and recordkeeping requirements of 40 CFR §§ 63.654 and 63.655[14]
118	VOC	• VOC limit of 3.94 tons per 12-month consecutive month period • Recordkeeping of the number of rail cars that vent to the atmosphere during loading, amount of propane or butane loaded, calculated emissions each month
735	NOx	• Annual tune-up or once in five (5) years if equipped with oxygen trim system • Recordkeeping related to the tune ups performed including, dates, service provider, operating rate or loads, CO and NOx emission rates, and final excess oxygen rate • NOx limit of 14.32 tpy calculated as a 12-month rolling sum
736	NOx	• Annual tune-up or once in five (5) years if equipped with oxygen trim system • Recordkeeping related to the tune ups performed including, dates, service provider, operating rate or loads, CO and NOx emission rates, and final excess oxygen rate • NOx limit of 24.36 tpy[15] calculated as a 12-month rolling sum

[13] PADEP's Conclusions summarized by EPA, EPA-R03-OAR-2021-3800-0005, pp 88-89

[14] DEP agrees with the RACT II summary with the exception of the change of the citation from 40 C.F.R. § 63.653 to 40 C.F.R. § 63.655. The emission averaging under 40 C.F.R. § 63.653 does not apply to this source.

[15] DEP agrees with the RACT II summary except changing a typographical error in the NOx limit from 14.32 tpy to 24.36 tpy.