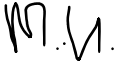


**CITY OF PHILADELPHIA
Department of Public Health
Environmental Protection Division
Air Management Services**

Memo

To: Kassahun Sellassie, Program Director

From: Maryjoy Ulatowski, Chief of Source Registration 

Date: 11/3/2023

Re: 2015 8-Hour RACT Analysis for Kinder Morgan Liquids Terminals, LLC
3300 North Delaware Avenue, Philadelphia,

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 § 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) 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 § 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 § 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 NO_x 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).

In addition to the explanation of the applicable regulatory requirements above, please include the following:

- A brief description of the facility and the sources being evaluated under § 129.114(i)(1)(i), 129.114(i)(1)(ii) and 129.114(i)(2). Mention which source is being evaluated under which provision.
- The date the applicant submitted the RACT II equals RACT III proposal.
- Whether the facility is major for NO_x and/or VOC.
- Mention the last date the facility received a full compliance evaluation.
- Describe here any violations present at the facility.

Facility Information

Kinder Morgan Liquids Terminals (KMLT), LLC owns and operates as a bulk liquid terminal, located at 3300 North Delaware Avenue, Philadelphia, PA 19134, that warehouses a variety of products/chemicals/materials based on customer's demand. The terminal is called the Philadelphia Terminal. The materials/chemicals are in-bounded via ship/barge, rail car, and tank trucks and then the materials/chemicals are stored in fixed roof and internal floating roof tanks. The material/chemicals in the tanks are shipped out by ship/barge (marine), rail tank car, and tank truck. Sources at the facility include boilers, tank/truck loading, marine loadings, storage tanks, compressors, emergency engine, fugitive emissions, and miscellaneous sources.

Table 1 below lists the sources at KMLT that are evaluated under the provisions of 25 PA Code 129.114(i)(1)(i), 129.11(i)(1)(ii), or 129.114(i)(2).

129.114(i)(1)(i) This option is chosen if no new air pollution control device is available or if the cost analysis done for RACT II (129.999(e)) resulted in a cost-effectiveness equal to or greater than \$7500 for NOx emission reduced or 12,000 per ton of VOC reduced. This option is also chosen if a control option during RACT II evaluation is was determined to be technically infeasible or no cost analysis was performed for another reason, such as a higher ranked control technology was installed.

129.114(i)(1)(ii) This option is chosen if the cost analysis done for RACT II (129.999(e)) resulted in a cost-effectiveness less than \$7500 for NOx emissions reduced or 12,000 per ton of VOC reduced.

129.114(i)(2) This option is chosen if for any sources which have new or upgraded control device, beyond what was elevated for RACT II (129.99(e)), which needs to be installed.

The sources in Table 1 below are evaluated under the provisions of 25 PA Code 129.114(i)(1)(i).

Table 1: Sources Evaluated under 129.114(i)

Source ID	Source Description	129.114(i)(1)(i)	129.114(i)(1)(ii)	129.114(i)(2)
M-LOAD (100A)	<u>Marine Loading Operations</u>	X		
V-LOAD-UNCON (100)	<u>Tank (Rail) and Truck Loading Operations</u> - All Uncontrolled Loading Positions	X		
	<u>Tank (Rail) and Truck Loading Operations</u> - Individual Uncontrolled Loading Positions	X		

KMLT submitted the RACT II equals RACT III proposal on December 29, 2022, as part of their RACT III notification. The most recent full compliance evaluation for the facility was on **5/30/2023**. To date, there have been no major significant compliance issues as a result of the inspection.

RACT III Applicability for NOx and VOC

Kinder Morgan Liquids Terminals, LLC - Philadelphia Terminal is not a major source of NOx having potential a NOx emissions less than 100 tons per year (tpy). The 100 tpy is the major source threshold in Philadelphia County that is applicable to NOx RACT for the 2015 8-hour ozone National Ambient Air Quality Standard (NAAQS).

Kinder Morgan Liquids Terminals, LLC is a major source of VOC having potential VOC emissions greater than 50 tpy. The 50 tpy is the major source threshold in Philadelphia County that is applicable to VOC RACT for the 2015 8-hour ozone NAAQS.

Below are the various air pollution sources at the facility:

Table 2: Air Pollution Sources at the Facility

Source ID	Source Name	Capacity / Fuel Type /Material	New source or change to existing source?	RACT II (CTG, Presumptive or Case by Case)	NO _x (tpy)	VOC (tpy)
CU02	Boiler #3, Hurst Boiler with Low NOx burner.	12.6 MMBTU/hr Natural Gas, No. 2 Fuel Oil During Gas Curtailment Only	No	Presumptive	2.75 ^h	0.30 ^h
CU01A	Boiler #2, York Boiler with Low NOx burner	13.4 MMBTU/hr Natural Gas, No. 2 Fuel Oil (During Gas Curtailment Only)	No	Presumptive	5.74 ^h	0.32 ^h
CD-03	Vapor Combustion Unit 2. Also controls MMA Truck Loading under Group 3.	Methyl Methacrylate (MMA) Burner: Natural Gas Burner: 16.2 MMBTU/hr	No	New Source as Of 2021	8.1 ^a	0.22 ^a
MVCU	Marine Vapor Combustion Unit (MVCU)	Burner: Natural Gas Burner:15.72 MMBTU/hr	No	Presumptive	6.7 ^h	0.37 ^h
M-Load	Marine Loading Operations (Controlled and Uncontrolled)	Controlled by CD-03 and MVCU	Yes, CD-03 now controls MAA as of 6/2021	Case-by-Case	N/A	29 ^{c, d}

Various (V-LOAD, CON)	Tank Car Truck Loading Operations (Controlled by Thermal Oxidizer, CD-02)		Yes, CD-05 can now control controlled tank car truck loading	CTG	N/A	171 ^b
Various (V-LOAD, UNCON)	Tank Car Truck Loading Operations (Uncontrolled)		No	Case-by-Case	N/A	129 ^c
Various	Storage Tanks		No	CTG	N/A	108 ^e
EG-1	Emergency Engine	490 HP	No	Presumptive	1.36 ^h	0.10 ^h
AC-1, AC-2	Air Compressors	Two (2) 48 HPs	No	Presumptive	1.6 ^h	0.56 ^h
	Tank Degassing		No	Presumptive	N/A	1.8 ^f
CD-04	Scrubber (For odor control only)		No	Not a source of VOC/NOx	N/A	N/A
CD-05	Scrubber to control MAA Loading Operations		Yes, IP issued in 2022	New Source as of 2022	N/A	N/A
FUG	Fugitive Emissions		No	CTG	N/A	negligible
TOTAL FACILITY PTE					< 100	> 50

a Permit limit from IP21-000063 dated 6/8/2021.

b Limit for controlled tank car truck loading is 57.0 pounds per hour from RACT Plan Approval IP16- 00233 dated 4/20/20. Assume 6000 hours per year of operations.

c Limit from RACT Plan Approval No. dated 6/8/2021.

d Both controlled and uncontrolled limit.

e Combined limit for storage tanks from various permits.

f Installation Permit No. 03047 dated May 21, 2004.

g AMS IP17-000248 dated 7/31/2017.

h Based on AP-42 emission factors

The following is a list of case-by-case VOC sources and the requirements from RACT II (IP16-000233 dated 4/20/2020). The RACT II permit was approved by EPA on 11/1/2021 under Federal Register 52.2064 (f)(5)

Source ID	Source Name	New source or change to existing source?	NO _x (tpy)	VOC (tpy)
M-Load	Marine Loading	Yes. At the time of RACT II, marine loading was uncontrolled except when loading cumene. Now the facility controls cumene and MMA (IP21-000063 dated 6/2021)		29
V-LOAD, UNCON	<u>Tank (Rail) and Truck Loading</u> - All Uncontrolled Loading Positions	No	N/A	129
	<u>Tank (Rail) and Truck Loading</u> - Individual Uncontrolled Loading Positions	No		9

- Loading operations at “uncontrolled tank car/truck loading positions” shall comply with the following:
 1. Total combined emissions from all “uncontrolled tank car/truck loading positions” at the facility combined shall be limited to 129 tons of VOC per 12 months rolling period;
 2. Emissions from each “uncontrolled tank car/truck loading position” shall not exceed 9.0 tons of VOC per 12-month rolling period; and
 3. Emissions from each “uncontrolled tank car/truck loading position” shall not exceed 18.1 pounds of VOC per hour.
- Marine vessel loading operations (including both controlled and uncontrolled loading) shall not exceed 29 tons of VOC per 12-month rolling period.
- Kinder Morgan shall monitor throughput of material processed and vapor pressures for all tanks, marine loading, and tank car/truck loading racks daily. For controlled and uncontrolled loading tank car/truck operations, Kinder Morgan Liquid Terminals, LLC shall keep records of the following:
 1. Which rack is being used for loading.
 2. Which position at each rack is being used for loading.
 3. Whether the position being used for loading is controlled or uncontrolled.
 4. The name of material loaded per position.

5. Throughputs of each material loaded per position.
 6. The corresponding vapor pressures of the material loaded per position.
 7. Emissions calculations from all uncontrolled loading rack positions on a monthly and rolling 12-month period to demonstrate compliance with 129 tpy VOC limit.
 8. Emissions calculations per uncontrolled loading rack position on an hourly, monthly, and rolling 12-month period to demonstrate compliance with individual VOC limit for uncontrolled loading positions.
- For marine vessel loading operations, Kinder Morgan Liquid Terminals, LLC shall keep records of the following:
 1. The name of material loaded.
 2. Whether the loading is controlled or uncontrolled.
 3. Throughputs of each material loaded.
 4. Vapor pressure (psia @ 20°C) of all commodities loaded into marine vessels and the temperature during loading operations.
 5. Emission calculations on a monthly and rolling 12-month period to demonstrate compliance with the 29 tpy VOC limit.

RACT II as RACT III

Kinder Morgan has reviewed the control options for Marine loading and uncontrolled loading positions at the facility. Based on review of USEPA RACT BACT LAER clearinghouse and other Kinder Morgan operations, there are no new control options that are reasonably available to VOC emissions.

The RACT II looked at the following Control Devices and various scenarios. The only technically Feasible Option was a new Thermal Oxidizer to control uncontrolled loading.

Control Device	Evaluation/ Analysis	1997 8-hr RACT	2008 8-hr RACT
		Conclusion Notes/Comments	Conclusion/ Notes/Comments
Thermal Oxidation	Scenario A: The existing MVCU to control organics with true vapor pressures of 0.4psia or greater.	Technically Infeasible. The facility voluntary took a reduction from 59 tpy of VOC to 51 tpy for uncontrolled loading.	Technically Feasible, but Economically Unreasonable.
	Scenario B: Existing MVCU to control organics with true vapor pressures of less than 0.4psia	Technically Infeasible.	Technically Infeasible.

	Scenario C: New Thermal Oxidation Unit or MVCU to control all VOC emissions from marine loading.	Technically Feasible, but Economically Unreasonable.	Still Technically Feasible, but Economically Unreasonable.
Carbon Adsorption	Install a Carbon Adsorption System	Technically Infeasible.	Technically Infeasible.
Bioreactor	Install a Bioreactor	Technically Infeasible.	Technically Infeasible.
Scrubbers	Install a Scrubber	Technically Infeasible.	Technically Infeasible.
Condensation	Install a Condenser	Technically Infeasible.	Technically Infeasible

The table below summarizes the economic feasibility from RACT II. The cost effectiveness for a Thermal Oxidizer was greater than \$12,000 per VOC removed.

Comparison between RACT II and RACT III Requirements

Source ID	Source Name	Control	NOx (\$/Ton)	VOC (\$/Ton)
M-LOAD	Marine loading	Thermal Oxidation, new unit to control all marine loading	N/A	\$19,512
V-LOAD-UNCON (100)	<u>Tank (Rail) and Truck Loading - All Uncontrolled Loading Positions</u>	Thermal Oxidation	N/A	\$ 17,678
	<u>Tank (Rail) and Truck Loading Operations - Individual Uncontrolled Loading Positions</u>	Thermal Oxidation	N/A	\$24,485

While not required since the cost effectiveness from RACT II was over \$12,000; the facility also reevaluated the feasibility of Thermal Oxidation during RACT III. The Table below summarizes the new evaluation of economic feasibility for the marine loading and uncontrolled loading operations from tank car and trucks.

Source ID	Source Name	Control	NOx (\$/Ton)	VOC (\$/Ton)
M-LOAD	Marine loading	Thermal Oxidation	N/A	\$67,980

V-LOAD-UNCON (100)	<u>Tank (Rail) and Truck Loading - All Uncontrolled Loading Positions</u>	Thermal Oxidation	N/A	\$17,665
	<u>Tank (Rail) and Truck Loading Operations - Individual Uncontrolled Loading Positions</u>	Thermal Oxidation	N/A	\$44,377

AMS has reviewed source information, control technologies or measures evaluated Kinder Morgan, and cost analysis performed by Kinder Morgan. AMS also performed an independent analysis which included, AMS's continuous review of permit applications since the applicability date of RACT II, internet searches, BACT/RACT/LAER Clearinghouse search, knowledge gained from the AMS permitting staff participating in technical presentations by several vendors and manufacturers of pollution control technology, and a review of EPA and MARAMA's documents. Based on our review of these documents, along with training and the expertise of the reviewing staff, AMS concludes that there are no new or updated air pollution control technologies available for the sources found at Kinder Morgan and determines that RACT II requirements for source M-LOAD and V-LOAD-UNCON at Kinder Morgan listed in the table assure compliance with requirement for RACT III for the § 129.111 - § 129.115.

Because RACT II requirements are being certified as continuing to be RACT, RACT III requirements are identical to RACT II and therefore are as stringent as RACT II.

Public discussion

- ⊖ No discussions occurred with the EPA, the company, or the public after the company submitted the RACT II is RACT III proposal application.

Attachments (6)

RACT III Notification
 RACT II = RACT III Form
 RACT II Cost Analysis – Proposal - 2014
 RACT III Cost Analysis – 12/2022
 RACT III Application
 RACT II Review Memo