

Document Summary

Date: February 23, 2021

EPN: SMR-SVENT

Product: Pollutants

Electronic File Location: O:\Projects\ENV30\60412573_APSteamVen\500-Deliverables\500-Deliverable

Copy to: Tammy Grover – with all attachments

Emission Summary – See Application



Air Products LLC
1435 Pasadena Fwy
Pasadena, TX 77506

February 23, 2021

Matthew Ray
Air Permits Division
Texas Commission on Environmental Quality (TCEQ)
Air Permits Division **MC-163**
P.O. Box 13087
Austin, Texas 78711

AIR PRODUCTS LLC - PASADENA PLANT, RN: 100221324
AIR PERMIT APPLICATION (PROJECT 323012)
STEAM METHANE REFORMER UNIT (PERMIT 27773)

Mr. Matthew Ray:

Please find attached to this letter the responses to your request for additional information submitted to Air Products on January 27, 2021. In addition, a technical update is also being provided as part of this submittal. A description of the technical update can be found in item #3 of the Notice of Deficiency (NOD) response. The following attachments are included as a part of this response:

- Attachment A: Notice of Deficiency Response
- Attachment B: Technical Update
 - Attachment B-1: Updated Emission Calculations (**CONFIDENTIAL**)
 - Attachment B-2: Federal Applicability
 - Attachment B-3: Speciated Rates Tables
- Attachment C: Testing Results (**CONFIDENTIAL**)
- PI-1 Workbook
- Updated EMEW and Supplemental Information

If you have any questions concerning this submittal, please contact me at (281) 478-3172, grovertb@airproducts.com.

Thank you,

Tammy Grover
Lead Environmental Engineer
Air Products LLC
North America Industrial Gases Environmental Team

**Air Products LLC – Steam Methane Reformer Unit
NSR Permit No. 27773 Amendment Response
February 23, 2021**



Prepared for:

*Air Products LLC
1435 Pasadena Fwy
Pasadena, TX 77506*

*Texas Commission on
Environmental Quality Account
Number: HG-0011-L*

*Customer Reference Number:
CN602299257*

*Regulated Entity Number:
RN1002221324*

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ATTACHMENT A: NOTICE OF DEFICIENCY RESPONSE – NSR PERMIT NO. 27773 AMENDMENT

Description

Attached are the responses to the questions in the request for additional information submitted to Air Products on January 27, 2021.

ITEM 1

The application states that the main purpose of the amendment is to increase the steam throughput for the steam methane reformer and that there are no expected upstream or downstream effects. Please elaborate on why the throughput is being increased and why no actual upstream or downstream emission rate increases are expected from this increase in steam usage. Please refer to the Major New Source Review Guidance on our website for questions on related analyses.

Response 1

In retrospect, that statement is not completely accurate. It would have been more accurate to specify the only downstream impact for this project is at the unit's steam vent. Those increases are represented with this amendment. The feed streams for the process are natural gas and steam while the product is hydrogen. This project will not result in increased feed streams or production capacity of hydrogen beyond what is currently authorized.

In the process description it was noted that the process condensate generated during production is utilized to produce steam. This steam has trace amounts of methanol, ethanol, and ammonia. The steam is used internally in the process and exported to customers. The remaining balance has always been routed to the steam vent, EPN SMR-SVENT. Recently, Air Products external customers for the steam was greatly reduced. To maintain the existing production capacity, the surplus of remaining steam will be greater than what can be utilized internally in the process. Therefore, Air Products would like to authorize an increase in the amount of steam routed to the steam vent, EPN SMR-SVENT. This is the primary reason for this permit amendment. We have determined the increased amount of steam for the steam vent and have found the impacts associated with the resultant emission increases of methanol, ethanol, and ammonia to be acceptable.

We would like to reiterate the following key points:

- **the existing allowables for all other sources in the facility are already authorized for the current production capacity,**
- **besides EPN SMR-SVENT, there are no other allowable increases being requested,**
- **this project is not requesting any increase in production capacity,**
- **this is not a capital project, i.e. the project does not require any construction or modifications,**
- **this project is necessary due to the loss of external customer demand for the steam that has resulted in a surplus, and**
- **Air Products would simply like to route this surplus steam to an existing vent that is already authorized to emit this same stream.**

ITEM 2

In the BACT section for the steam reformer process vent the application mentions a control exemption under 115.127. Please specify exactly which exemption is being referenced under 115.127 for this review.

Response 2

The exemption that is being referenced is 30 TAC §115.127(a)(2)(B) – the steam reformer process vent maintains a volatile organic compound (VOC) concentration less than 612 parts per million by volume (ppmv), therefore EPN SMR-SVENT is exempt from control requirements.

ATTACHMENT A: NOTICE OF DEFICIENCY RESPONSE – NSR PERMIT NO. 27773 AMENDMENT

ITEM 3

The application references testing performed from 2016-2019 being utilized to adjust the concentrations of pollutants in the stream from the process vent. Please provide the testing being referenced for the application.

Response 3

The testing that is referenced in the initial submittal comes from analytical reports from 2016 to 2019. The analysis of the steam vent's composition is utilized to determine the concentrations of air pollutants methanol, ethanol, and ammonia. These analytical reports have been provided under confidential cover in Appendix C of this response.

Technical Update associated with testing results: While gathering the reports for your reference, we noted that the methanol and ethanol concentrations for 2018 were inadvertently excluded from our calculation of the overall concentration. After incorporating the missing data, the maximum and average concentrations of both methanol and ethanol increased slightly, which results in increased VOC emissions. The updated calculation for EPN SMR-SVENT is provided in Appendix B of this document.

Updated confidential emission calculations, federal applicability analysis, and speciated rates table can be found in Appendix B of this document. An updated PI-1 workbook, an updated Electronic Modeling Evaluation Workbook (EMEW) and updated supplemental information document are also being provided with this response.

Due to the increase in methanol and ethanol emissions, the MERA analysis and screening analysis (found in the supplemental information PDF) was updated to show that impacts are still less than 10% of the ESL for these compounds. There are no changes to the AERMOD unit impact model, so only the updated EMEW and supplemental information (containing the updated emission rates and updated screening analysis) are being submitted at this time.

ATTACHMENT B: TECHNICAL UPDATE

Description

Attached are the updated emission calculations, federal applicability analysis, and speciated rates tables associated with EPN SMR-SVENT, based on the analytical testing reports provided in Appendix C of this document.

Description	Page Number
Attachment B-1: Updated Emission Calculations (CONFIDENTIAL)	B-2
Attachment B-2: Federal Applicability	B-5
Attachment B-3: Speciated Rates Tables	B-10

Air Products Pasadena

NSR 27773 Permit

Air Products LLC Pasadena Facility

Confidential pages have been removed from this version of the submittal. Any request for portions of this application that are marked as confidential must be submitted in writing, pursuant to the Public Information Act, to the Texas Commission on Environmental Quality, Public Information Coordinator, MC-197, P.O. Box 13087, Austin, Texas 78711-3087

Attachment B-2

Federal Applicability

**Federal Applicability Analysis
Air Products LLC - Steam Methane Reformer Unit
Permit to Amend NSR 27773**

	VOC
Total of Increases only	22.35
PSD Significance Levels	
PSD Site Netting Supplied?	
Site Contemporaneous increase	
PSD Applicable?	
NNSR Significance Levels	5
NNSR Net Project Increase	22.35
NNSR Project Netting Required?	YES
Major Modification Threshold	25
NNSR Applicable?	NO

Basis for Determination:

This determination is based on the project information and the TCEQ's guidance document, APDG 5881, "Major New Source Review - Applicability Determination", September 2019.

Post-Project Maximum Allowable Annual Emissions, T/yr

Emission Units affected by project		VOC
EPN	FIN	
SMR-SVENT	STEAM	25.22

Pre-Project Actual Annual Emissions, T/yr (24 month average)

SUBSTITUTE THE PRECHANGE ALLOWABLE IF IT IS SMALLER THAN THE ACTUAL

Emission Units affected by project		VOC
EPN	FIN	
SMR-SVENT	STEAM	2.87

Changes in Emissions , T/yr

(Post-Project Allowable,T/yr) - (Pre-Project Actual, T/yr)

Emission Units affected by project		VOC
EPN	FIN	
SMR-SVENT	STEAM	22.35



Permit No.: 27773	Application Submittal Date: December 2020
Company: Air Products LLC	
RN: 100221324	Facility Location: Pasadena
City: Pasadena	County: Harris
Permit Unit I.D.:	Permit Name: Air Products - Steam Methane Reformer (SMR) Unit
Permit Activity: New Source <input checked="" type="checkbox"/> Modification	
Project or Process Description: Air Products - SMR Steam Vent Flowrate Increase	

Complete for all Pollutants with a Project Emission Increase.	POLLUTANTS						
	Ozone		CO	NO _x	PM ₁₀	SO ₂	Pb
	VOC	NO _x					
Nonattainment? (yes or no)	YES	YES	NO	NO	NO	NO	NO
PSD? (yes or no)	NO	NO	NO	NO	NO	NO	NO
Existing site PTE (tpy)?	>25	>25	>100	>40	>15	>40	>0.6
Proposed project emission increases (tpy from 2F) ¹	22.35	0.00	0.00	0.00	0.00	0.00	0.00
Is the existing site a major source?	YES	YES	YES	YES	YES	YES	YES
If not, is the project a major source by itself? (yes or no)							
If site is major, is project increase significant?	YES	NO	NO	NO	NO	NO	NO
If netting required, estimated start of construction?	11/1/21						
5 years prior to start of construction	11/1/16 contemporaneous						
Estimated start of operation	11/1/21 period						
Net contemporaneous change, including proposed project, from Table 3F. (tpy)	22.35						
Major NSR Applicable? (yes or no)	NO	NO	NO	NO	NO	NO	NO

² Nonattainment major source is defined in Table 1 in 30 TAC 116.12(11) by pollutant and county. PSD thresholds are found in 40 CFR § 51.166(b)(1).

³ Sum of proposed emissions minus baseline emissions, increases only. Nonattainment thresholds are found in Table 1 in 30 TAC 116.12(11) and PSD 51.166(b)(23) thresholds in 40 CFR § 51.166(b)(23).

The representations made above and on the accompanying tables are true and correct to the best of my knowledge.

Signature	Title	Date
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**TABLE 2F
PROJECT EMISSION INCREASE**

Pollutant ¹ :				Volatile Organic Compound (VOC)				Permit:				27773			
Baseline Period:				N/A											
Affected or Modified Facilities ²				Permit No.	Actual Emissions ³	A	B	Projected Actual Emissions	Difference (B-A) ⁶	Correction ⁷	Project Increase ⁸				
FIN		EPN				Baseline Emissions ⁴	Proposed Emissions ⁵								
Routine Emissions															
1	STEAM		SMR-SVENT		27773	2.87	2.87	25.22		22.35		22.35			
										Page Subtotal ⁹		22.35			
										Table Total		22.35			

¹ Individual Table 2F's should be used to summarize the project emission increase for each criteria pollutant.

² Emission Point Number as designated in NSR Permit or Emissions Inventory.

³ All records and calculations for these values must be available upon request.

⁴ Correct actual emissions for currently applicable rule or permit requirements, and periods of non-compliance. These corrections, as well as any MSS previously demonstrated under 30 TAC 101, should be explained in the Table 2F supplement.

⁵ If projected actual emission is used it must be noted in the next column and the basis for the projection identified in the Table 2F supplement.

⁶ Proposed Emissions (column B) minus Baseline Emissions (column A).

⁷ Correction made to emission increase for what portion could have been accommodated during the baseline period. The justification and basis for this estimate must be provided in the Table 2F supplement.

⁸ Obtained by subtracting the correction from the difference. Must be a positive number.

⁹ Sum all values for this page.



**TABLE 3F
PROJECT CONTEMPORANEOUS CHANGES¹**

Company:	Air Products LLC	
Permit Application Number:	27773	Criteria Pollutant: VOC

Project Date ²		Facility at Which Emission		Permit No.	Project Name or Activity	Baseline Period	A	B	Difference (B-A) ⁶	Creditable Decrease or
		FIN	EPN				Baseline Emissions	Proposed Emissions		
1	12/1/2017	---	---	27773	NSR PERMIT NO. 27773 STEAM		0	-	-	-
Page Subtotal⁸										0.00
Project Emission Increase(from Table 2F)										22.35
Summary of Contemporaneous Changes										22.35
Total (Includes Project Increases)										22.35

Please Note: VOC emission increases have been evaluated during the contemporaneous period and found no VOC emission changes.

Footnotes:

- 1 Individual Table 3F's should be used to summarize the project emission increase and net emission increase for each criteria pollutant.
- 2 The start of operation date for the modified or new facilities. Attach Table 4F for each project reduction claimed.
- 3 Emission Point No. as designated in NSR Permit or Emissions Inventory.
- 4 All records and calculations for these values must be available upon request.
- 5 All records and calculations for these values must be available upon request.
- 6 Proposed (column A) - Baseline (column B).
- 7 If portion of the decrease not creditable, enter creditable amount.
- 8 Sum all values for this page.
- 9 Start of Construction - Upon Issuance of Amended Permit
- 10 Contemporaneous Netting Window Begins - November 2013

TCEQ - 10156(Revised 03/12) Table 3F

These forms are for use by facilities subject to air quality permit requirements and may be revised periodically. (APDG 5913v2)

Attachment B-3

Speciated Rates Tables

Air Products LLC - Steam Methane Reformer Unit
Application To Amend Permit No. 27773
Speciated Emission Change Summary, lb/hr

Previously Authorized MAERT Limits, lb/hr

EPN	FIN	Description	Ammonia	Ethanol	Methanol
SMR-SVENT	STEAM	SMR Steam Vent	1.39	0.57	9.79

Post Project Speciated Limits, lb/hr

EPN	FIN	Description	Ammonia	Ethanol	Methanol
SMR-SVENT	STEAM	SMR Steam Vent	7.32	1.16	12.52

Net Change Speciated VOC Emissions Limits, lb/hr

EPN	FIN	Description	Ammonia	Ethanol	Methanol
SMR-SVENT	STEAM	SMR Steam Vent	5.93	0.59	2.74
Net Hourly Change			5.93	0.59	2.74
Total of hourly Increases			5.93	0.59	2.74
Total of hourly decreases			-	-	-

Air Products LLC - Steam Methane Reformer Unit
Application To Amend Permit No. 27773
Speciated Emission Change Summary, tpy

Previously Authorized MAERT Limits, tpy

EPN	FIN	Description	Ammonia	Ethanol	Methanol
SMR-SVENT	STEAM	SMR Steam Vent	2.61	0.23	2.77

Post Project Speciated Limits, tpy

EPN	FIN	Description	Ammonia	Ethanol	Methanol
SMR-SVENT	STEAM	SMR Steam Vent	17.42	1.38	23.84

Net Change Speciated VOC Emissions Limits, tpy

EPN	FIN	Description	Ammonia	Ethanol	Methanol
SMR-SVENT	STEAM	SMR Steam Vent	14.81	1.14	21.08
Net Annual Change			14.81	1.14	21.08
Total of annual Increases			14.81	1.14	21.08
Total of annual decreases			-	-	-
Annual Dec : Inc Ratio			-	-	-

Air Products Pasadena

NSR 27773 Permit

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