Air Products LLC
1435 Pasadena Fwy
Pasadena, Texas 77506

December 2020

FEDEX

Texas Commission on Environmental Quality
Air Permits Initial Review Team **MC-161**
P.O. Box 13087
Austin, Texas 78711-3087

Subject: **Steam Methane Reformer Unit**
NSR Permit No. 27773 Amendment Application
Air Products LLC Pasadena Facility
1435 Pasadena Fwy
Pasadena, Texas, Harris County
RN: 100221324; Account No.: HG-0011-L

Dear Sir or Madam:

Air Products LLC (Air Products) owns and operates the Steam Methane Reformer at the Pasadena Facility in Pasadena, Texas (Harris County) in accordance with conditions contained in Texas Commission on Environmental Quality (TCEQ) – New Source Review (NSR) Air Permit No. 27773. Air Products submits this application to amend NSR Permit No. 27773.

Enclosed is – TCEQ Form PI-1 General Application Workbook, a summary of emission rates, and additional information to demonstrate that all permit application representations meet the requirements for an NSR Permit amendment. This application contains confidential business information, included in a separate confidential section.

Although it appears that multiple historical air authorizations have been reviewed by staff in the Chemicals Section, since this facility is classified under SIC 2813 for Industrial Gases, it would be more appropriate to undergo review with staff in the Energy Section. An updated Core Data Form is being submitted as part of this package to reflect SIC 2813. Air Products similar facility projects in Baytown and Texas City have both been assigned to the Energy Section over the past several years. As such, for a consistency basis, we would like to request that a reviewer in the Energy Section be assigned to this project.

If you have any questions concerning this project, please contact me at (281) 478-3172 or at e-mail address: grovertb@airproducts.com.

Sincerely,

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

Air Products LLC
1435 Pasadena Fwy
Pasadena, Texas 77506

Enclosures

cc: Air Section Manager, Air Program, TCEQ, OCE/FO Region XII
5425 Polk Street, Suite H
Houston, Texas 77023-1452

Harris County Pollution Control
Services Department
101 S. Richey St, Ste. H
Pasadena, Texas 77506-1023

Air Products LLC - Air Products Pasadena Facility
1435 Pasadena Fwy
Pasadena, TX 77506
Steam Methane Reformer Unit
NSR Permit No. 27773 Amendment Application
December 2020

Prepared for:

Air Products LLC – Pasadena Plant
1435 Pasadena Fwy.
Pasadena, TX 77506
Texas Commission on Environmental Quality Account Number: HG-0011-L
Customer Reference Number: CN602299257
Regulated Entity Number: RN100221324

Prepared by:

AECOM
19219 Katy Freeway
Suite 100
Houston, TX 77094

TABLE OF CONTENTS

General Application Overview

Air Products LLC operates the Steam Methane Reformer Unit near Pasadena, Texas (Harris County). The facility operates under Texas Commission on Environmental Quality (TCEQ) – New Source Review (NSR) Air Permit No. 27773. The current application represents a permit amendment for the SMR Steam Vent. With this permit amendment, Air Products LLC is requesting an increase in emission rates in VOC and ammonia for the SMR Steam Vent (EPN: SMR-SVENT).

Introduction

This amendment will authorize the emission increases for VOC and ammonia in the SMR-SVENT. Emission increases result from the increase in flow rate of steam into the Steam Reformer Unit, as well as from adjusting the concentrations of the compounds within the steam based on the sample data taken from 2016-2019.

A detailed discussion of requested changes is located in the section titled **Permit Information**. Additional information may be provided upon request. The following lists the location of information submitted to support the permit amendment application:

PI-1 Workbook General Tab Section	Description	See Page
I.	Applicant Information	2
III.	Permit Information	4
VI.	Application Materials	8
VI.J.	State Regulatory Requirements	19

PI-1 Workbook Technical Tab Section	Description	See Page
II.	Federal Regulatory Requirements	26

PI-1 Workbook Fees Tab Section	Description	See Page
VI.	Permit Fee Information	29

Applicant Information

Overview

In this Section

The following section contains information provided to support the air permit application:

Applicant Information (Continued)

General Site Information	Air Products LLC operates the Steam Methane Reformer Unit near Pasadena, Texas (Harris County). The facility operates under Texas Commission on Environmental Quality (TCEQ) – New Source Review (NSR) Air Permit No. 27773. An updated Core Data form is being submitted as part of this application to establish the SIC Code as 2813 for Industrial Gases. See Appendix A.
Confidential Information	Confidential information is included in this submittal; therefore, the appropriate pages are labeled as **CONFIDENTIAL** and are submitted as an independent package.
Additional Submittals	This air permit application should be administratively complete and meet all applicable New Source Review Permit Requirements. Please note that some information is only available in the confidential section of the application. During the technical review, Air Products LLC will provide additional information upon request.
Concurrent Permit Actions	Currently, Air Products LLC has no permit applications under review by the Texas Commission on Environmental Quality (TCEQ).

Permit Information

Overview

In this Section

The following section contains information provided to support the air permit application:

Permit Information (Continued)

Project Scope	Through this permit amendment of NSR Permit No. 27773, Air Products LLC proposes an increase to the steam flowrate at the Steam Reformer Unit. The proposed flowrate will cause an increase in the emission rates of VOC and ammonia that is emitted through the EPN SMR-SVENT. The proposed project will meet all the general and specific requirements to amend a permit as discussed in this permit amendment application. Additional information will be provided upon request.
Project Impact on Associated Facilities	Air Products LLC does not anticipate any impacts on upstream or downstream facilities as a result of the proposed modifications addressed in this amendment application.
Impact on Central Wastewater and Solid Waste Facilities	This permit action will not increase wastewater at the on-site WWTP or solid waste generation.
Other Regulatory Impacts	This project does not change current regulatory impacts, nor trigger new regulatory applicability.
FIN and EPN Updates	Air Products LLC is not requesting any updates to the Facility Identification Numbers (FINs) and Emission Point Numbers (EPNs) that are associated with this permit action.
Permit Consolidations	There are no permits to be consolidated into NSR Permit No. 27773 at this time.
Changes to Qualified Facilities	There are no changes to qualified facilities to be incorporated into NSR Permit No. 27773 at this time.
Permit Alterations	There are currently no pending permit alterations for Permit No. 27773. No permit alterations have been submitted since the last amendment.
Title V Permit Applicability	The Steam Methane Reformer Unit is currently authorized under Title V Permit O2309. A minor permit revision, in accordance with §122.215 and §122.216, will be required to be submitted prior to the implementation of the operational changes.

Public Notice Information/Applicability

In this Section

The following section contains information provided to support the air permit application:

Public Notice Information/Applicability (Continued)

Public Notice Requirement	The Texas Clean Air Act (TCAA) § 382.056 and 30 TAC Chapter 39 requires the publication of notice of intent to obtain a permit renewal and/or permit amendment. Air Products will publish notice of this permit amendment in a newspaper of general circulation in the Pasadena area where the SMR Steam Vent Facility is located. The notice will include a description of the facility, the fact that a person who may be affected by emissions from the facility may request a public hearing, and any other information the TCEQ requires by rule.
Total Annual Emission Increases	The proposed permit amendment application for the Steam Methane Reformer Unit does not represent a major modification for New Source Review (NSR) regulations or Prevention of Significant Deterioration (PSD) Review. There are emissions increases of VOC and ammonia resulting from the proposed modification represented in this permit amendment application, therefore a NSR review will be required.
NNSR Applicability	Nonattainment New Source Review (NNSR) requirements apply to projects that represent a "major modification", which is defined as either a physical change or a change in the method of operation that results in a net contemporaneous increase in emission rates greater than 25 tons per year (tpy) of Nitrogen Oxides (NOx) or Volatile Organic Compounds (VOC). An initial determination of NNSR applicability involves comparing proposed project increase in emission rates for NOx and VOC to the initial applicability threshold of 5 tpy for severe ozone nonattainment areas. There are emissions increases of VOC associated with this permitting action; therefore, further analysis is required. Netting was required for VOC; therefore, to determine if the increased VOC emissions triggered a major modification, Air Products performed a contemporaneous netting analysis. The analysis looked at site-wide creditable emission decreases and increases during the contemporaneous window and compared the sum of those projects to the proposed VOC emission rate increases. The contemporaneous review resulted in a site contemporaneous net below the 25 tpy threshold; therefore, the net increases are not significant and NNSR is not required.
PSD Applicability	Prevention of Significant Deterioration (PSD) requirements apply to projects that represent a "major modification", which is defined as either a physical change or a change in the method of operation that results in a net contemporaneous increase in emission rates increase greater than the following thresholds: 100 tpy of Carbon Monoxide (CO); 40 tpy of Nitrogen Oxide (NO_x); 25 tpy of Particulates (PM); 15 tpy of Particulates (PM_{10}); 10 tpy of Particulates ($PM_{2.5}$); and 40 tpy of Sulfur Dioxide (SO_2). The associated project does not have the emission rate increases greater than the PSD applicability thresholds for NO_x, CO, PM, PM_{10}, $PM_{2.5}$, or SO_2; therefore, a PSD review is not required.
Health Impact Review	A health impacts review will be required since there are emission rate increases associated with this permitting action.

Technical Information

In this section

The following technical information is provided to support the permit application:

Area Map

Area Map	Air Products LLC is submitting an area map as part of this submittal included in the Modeling Supplemental Information.

Plot Plan

Plot Plan	Air Products LLC is submitting a plot plan as part of this submittal included in the Modeling Supplemental Information.

Process Flow Diagram

Process Flow Diagram	Air Products LLC considers the process flow diagram to be confidential information; therefore, Appendix D contains a process flow diagram.

Process Description

Process Description

The Air Products Pasadena steam methane reforming process mixes steam and natural gas together and then runs this mixture over a series of catalysts to produce hydrogen. The reactions that produce the hydrogen are shown below.

Catalyst 1: Pre-Reformer

Eqn. 1a $[CH]_4+H_2O \leftrightarrow CO+3H_2$

Eqn. 1b $CO_2+H_2 \leftrightarrow CO+H_2O$

Catalyst 2: Primary Reformer

Eqn. 2a $CH_4+H_2O+Heat \leftrightarrow CO+3H_2$

Eqn. 2b $CO+H_2O \leftrightarrow CO_2+H_2+Heat$

Eqn. 2c $N2+3H2 \leftrightarrow 2NH_3$

Catalyst 3: High Temperature Shift (HTS)

Eqn. 3a $CO+ H_2O \leftrightarrow CO_2+H_2+Heat$

Eqn. 3b $[CO+2H]_2+Copper\ Catalyst \leftrightarrow [CH]_3OH$

After the process gas has gone through the three catalysts, the hydrogen has to be separated out from the rest of the components. First, the process gas is cooled and the excess steam is condensed in a phase separator vessel (V-112). Next the remaining process gas is sent to a set of Pressure Swing Adsorption vessels which contain adsorbent that preferentially adsorbs the undesired components and separates the process gas into a pure hydrogen stream and a waste gas stream known as purge gas. The waste purge gas that was adsorbed in the vessel is then desorbed through changes in pressure and burned as fuel in the reformer. The hydrogen is now at a 99.99% purity level and can be sent out as product hydrogen.

The liquid removed during the separation in the V-112 is known as process condensate. The process condensate is 99.9% water with PPM levels of dissolved methanol, ethanol, and ammonia. The methanol and extremely small amounts of ethanol are formed in the HTS vessel because of the presence of copper in the catalyst (eqn. 3b). The ammonia is formed in the primary reformer where the small amount of nitrogen that is present in the natural gas feed reacts with the hydrogen to produce ammonia (eqn. 2c).

The process condensate is then mixed with any additional water needed to produce steam. This steam is used internally in the process and exported to the customer. Any remaining steam is vented. This steam vent is where the methanol, ethanol, and ammonia are emitted to the atmosphere.

FIN/EPN Cross-Reference Table

Introduction

The following table documents the Facility Identification Number (FIN) to Emission Point Number (EPN) relationship in this permit application:

FIN	EPN	DESCRIPTION
STEAM	SMR-SVENT	SMR Steam Vent

Maximum Emission Data and Calculations

Maximum Emission Data and Calculations	Air Products considers emission calculations to be confidential business information. Therefore, Appendix E contains detailed emission calculations for the sources(s) addressed in the permit application.
Emission Calculation Changes	Air Products LLC is increasing the flowrate of steam into the Steam Methane Reformer Unit as well as adjusting the concentrations of VOC, methanol, ethanol, and ammonia based on samples from the past three years (2016-2019) as a part of this permit action.

Table 1(a) – Emission Point Summary

Emission Information	The following is Table 1(a) representing emission limits for the Steam Methane Reformer Unit. Air Products considers stack parameters to be confidential business information; therefore, Appendix D contains stack parameters. Additionally, Air Products considers emission calculations to be confidential business information; therefore, Appendix E contains the associated emission rate calculations for each source.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date:	December 2020	**Permit No.:**	27773	**Regulated Entity No.:**	100221324
Area Name:	Steam Methane Reformer Unit			**Customer Reference No.:**	602299257

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA					
1. Emission Point			**2. Component or Air**	**3. Air Contaminant Emission Rate**	
(A) EPN	**(B) FIN**	**(C) Name**	**Contaminant Name**	**(A) Pound per Hour**	**(B) TPY**
SMR-SVENT	STEAM	SMR Steam Vent	VOC	12.33	23.84
			Ammonia	7.32	17.42

Footnotes

EPN = Emission Point Number (EPN)

FIN = Facility Identification Number (FIN)

Table 2 – Material Balance

Material Balance	Air Products LLC is not submitting a material balance as part of this submittal, as no changes are being made and the previously submitted material balance is still considered accurate. Further information is available upon request.

Maintenance, Startup, and Shutdown

Routine Maintenance, Startup, and Shutdown (MSS)	The MSS activities are not included for the Steam Methane Reformer Unit facility as part of this permit amendment, because there are no changes being requested to the current representations at this time.

State Regulatory Requirements

In this section The following is a list of topics in this section:

Compliance with 30 TAC Rules

30 TAC Chapter 101	GENERAL RULES **The Steam Methane Reformer Unit will be operated according to the General Rules relating to circumvention, nuisance, traffic hazards, notification requirements for emissions events, notification requirements for scheduled maintenance/startup/shutdowns, sampling, sampling ports, emissions inventory requirements, sampling procedures and terminology, compliance with Environmental Protection Agency Standards, the National Primary and Secondary Air Quality Standards, inspection fees, emissions fees, and all other applicable General Rules.**
30 TAC Chapter 111	Control of Air Pollution from Visible Emissions and Particulate Matter **Air Products LLC will comply as applicable.**
30 TAC Chapter 112	Control of Air Pollution from Sulfur Compounds **The Steam Methane Reformer Unit facility is not subject to this regulation.**
30 TAC Chapter 113	Control of Air Pollution from Toxic Materials **The Steam Methane Reformer Unit facility is not subject to this regulation.**
30 TAC Chapter 114	Control of Air Pollution from Motor Vehicles **All motor vehicles at the Steam Methane Reformer Unit facility are operated and maintained in compliance with this regulation.**
30 TAC Chapter 115	Control of Air Pollution from Volatile Organic Compounds **The Steam Methane Reformer Unit facility is subject to this regulation, and complies with all requirements of 30 TAC Chapter 115.**
30 TAC Chapter 116	Control of Air Pollution by Permits for New Construction or Modification **This application for a TCEQ air permit fulfills the requirements of 30 TAC Chapter 116.**
30 TAC Chapter 117	Control of Air Pollution from Nitrogen Compounds **The Steam Methane Reformer Unit facility is not subject to this regulation .**
30 TAC Chapter 118	Control of Air Pollution Episodes **The Air Products LLC site is located in Harris County. The site emits less than 100 ton per year of the air contaminants specified in Table 1 of §118.1 and is not required to have an air pollution episode plan**.
30 TAC Chapter 122	Federal Operating Permit **Air Products LLC will comply with 30 TAC Chapter 122. The facility is regulated under Federal Operating Permit NO. O2309.**

Compliance with 30 TAC Rules (continued)

§116.111(a)(2)(A)(i)	Protection of public health and welfare. The emissions from the proposed facility will comply with all rules and regulations of the commission and with the intent of the TCAA, including protection of the health and property of the public. **As described in this section, Air Products LLC will comply with all air quality rules and regulations of the TCEQ and with the intent of the TCAA, including protection of the health and physical property of the public.**
§116.111(a)(2)(A)(ii)	For issuance of a permit for construction or modification of any facility within 3,000 feet of an elementary, junior high/middle, or senior high school, the commission shall consider any possible adverse short-term or long-term side effects that an air contaminant or nuisance odor from the facility may have on the individuals attending the school(s). **The emissions from the Steam Methane Reformer Unit will comply with the rules and regulations of the TCEQ and the intent of the TCAA. There are no schools within 3,000 feet of the plant. Therefore, §116.111(a)(2)(A)(ii), which requires verification that the emissions from the facility will not result in any short-term or long-term side effects or nuisance odors upon any individual attending a school within 3,000 feet of the facility, does not apply.**
§116.111(a)(2)(B)	Measurement of emissions. The proposed facility will have provisions for measuring the emission of significant air contaminants as determined by the executive director. This may include the installation of sampling ports on exhaust stacks and construction of sampling platforms in accordance with guidelines in the "Texas Commission on Environmental Quality Sampling Procedures Manual." **Air Products will operate in compliance with rules relating to the measurement of emissions with significant air contaminants as determined by the TCEQ.**
§116.111(a)(2)(C)	Best available control technology (BACT) must be evaluated for and applied to all facilities subject to the TCAA. Prior to evaluation of BACT under the TCAA, all facilities with pollutants subject to regulation under Title I Part C of the Federal Clean Air Act (FCAA) shall evaluate and apply BACT as defined in §116.160(c)(1)(A) of this title (relating to Prevention of Significant Deterioration Requirements). **The Steam Methane Reformer Unit will use BACT with consideration given to the technical practicality and economic reasonableness of reducing or eliminating emissions from the sources listed in the permit as detailed in the BACT Review section of this application.**
§116.111(a)(2)(D)	New Source Performance Standards (NSPS) **The Air Products Steam Methane Reformer Unit is subject to NSPS, and is in compliance with all requirements.**

Compliance with 30 TAC Rules (continued)

§116.111(a)(2)(E)	National Emission Standards for Hazardous Air Pollutants (NESHAP) **The Air Products Steam Methane Reformer Unit is not subject to NESHAP.**
§116.111(a)(2)(F)	NESHAP for Source Categories **The Air Products Steam Methane Reformer Unit is not subject to NESHAP.**
§116.111(a)(2)(G)	Performance Demonstration. The proposed facility will achieve the performance specified in the permit application. The applicant may be required to submit additional engineering data after a permit has been issued in order to demonstrate further that the proposed facility will achieve the performance specified in the permit application. In addition, dispersion modeling, monitoring, or stack testing may be required. **The sources presented in this application will perform as represented. Source emissions will not exceed the emission rates represented in Section VIII of this application.**
§116.111(a)(2)(J)	Computerized air dispersion modeling may be required by the executive director to determine air quality impacts from a proposed new facility or source modification. In determining whether to issue, or in conducting a review of, a permit application for a shipbuilding or ship repair operation, the commission will not require and may not consider air dispersion modeling results predicting ambient concentrations of non-criteria air contaminants over coastal waters of the state. The commission shall determine compliance with non-criteria ambient air contaminant standards and guidelines at land-based off-property locations. **Emission increases are proposed as a part of this project, therefore dispersion modeling is applicable.**
§116.111(a)(2)(L) Mass Cap and Trade Allowances	If subject to Chapter 101, Subchapter H, Division 3, of this title (relating to Mass Emissions Cap and Trade Program), the proposed facility, group of facilities, or account must obtain allowances to operate. **Air Products will comply with Chapter 101, Subchapter H, Division 3 as applicable.**

Compliance with 30 TAC Rules (continued)

30 TAC §116.311

The following specifies how the facility is complying with the permit amendment requirements outlined in 30 TAC 116.311.

(a) In order to be granted a permit renewal, the permit holder shall submit information in support of the application which demonstrates that:

(1) dockside vessel emissions associated with the facility will comply with all rules and regulations of the commission and with the intent of the TCAA, including protection of the health and property of the public and minimization of emissions to the extent possible, consistent with good air pollution practices.

There are no dockside vessel emissions associated with this permit action.

(2) the facility is being operated in accordance with all requirements and conditions of the existing permit, including representations in the application for permit to construct and subsequent amendments, and any previously granted renewal, unless otherwise authorized for a qualified facility;

The Steam Methane Reformer Unit will operate according to all applicable requirements of the current air permit.

(3) the facility meets the requirements of any applicable New Source Performance Standards as listed under Title 40 Code of Federal Regulations (CFR) Part 60, promulgated by the EPA under the authority of the FCAA, §111, as amended;

The Steam Methane Reformer Unit is not subject to 40 CFR 60 (NSPS), and will comply with the requirements.

(4) the facility meets the requirements of any applicable emission standard for hazardous air pollutants as listed under Title 40 CFR Part 61, promulgated by EPA under the authority of the FCAA, §112, as amended; and

The Steam Methane Reformer Unit is not subject to 40 CFR 61 (NESHAPs).

(5) the facility meets the requirements of any applicable maximum achievable control technology standard as listed under 40 CFR Part 63, promulgated by the EPA under FCAA, §112 or as listed under Chapter 113, Subchapter C of this title (relating to National Emissions Standards for Hazardous Air Pollutants for Source Categories (FCAA §112, 40 CFR 63)).

The Steam Methane Reformer Unit is not subject to 40 CFR 63 (MACT).

Compliance with 30 TAC Rules (continued)

30 TAC §116.311

(6) the facility meets the requirement of Subchapter C of this chapter (relating to Hazardous Air Pollutants: Regulations Governing Constructed or Reconstructed Major Sources (FCAA §112(g), 40 CFR 63)).

The amendment does not create or modify any affected source according to the definitions above.

(b) In addition to the requirement in subsection (a) of this section, if the commission determines it necessary to avoid a condition of air pollution or to ensure compliance with otherwise applicable federal or state air quality control requirements, then:

(1) the applicant may be required to submit additional information regarding the emissions from the facility and their impacts on the surrounding area; and

Upon request, additional information will be submitted to the commission.

(2) the commission shall impose as a condition for renewal only those requirements the executive director determines to be economically reasonable and technically practicable considering the age of the facility and the impact of its emissions on the surrounding area.

This requirement is a mandate for the TCEQ. No compliance activity is required at the Steam Methane Reformer Unit facility in conjunction with this regulation.

(c) A compliance history review must be conducted in accordance with Chapter 60 of this title (relating to Compliance History).

This requirement is a mandate for the TCEQ. No compliance activity is required at the Steam Methane Reformer Unit in conjunction with this regulation.

BACT Review

General BACT Review

For any facility that is either being modified or amended as a part of this project or affected by the incorporation or consolidation of a PBR or Standard Permit, a Best Achievable Control Technology (BACT) review is required. This ensures that the permit continues to meet the BACT requirements as specified in §116.111(a)(2)(C).

The only change being requested as a part of this permit application includes is an increase in the flowrate of steam through the process. This purposed increase with cause an increase in VOC and ammonia emissions from the SMR-Vent.

Emission Unit	Pollutant	Proposed BACT
Process Vent (EPN: SMR-SVENT)	VOC	Vent gas stream sampling measured a concentration of around 64 ppm (total of methanol and ethanol), this concentration represents around 10% of the maximum allowable concentration for control exemption under §115.127. The concentration of VOC in the stream is so low, additional control is not required.
	NH3	There is no established TCEQ BACT for this type of process vent emitting ammonia. Therefore, no control is accepted as BACT for the ammonia increase (5.93 lb/hr & 14.81 tpy) from this vent.

Federal Regulatory Requirements

In this section The following represents a list of topics in this section:

Federal Regulatory Requirements (Continued)

In this section	The following summarizes applicability of federal regulations:
NSPS	The Steam Methane Reformer Unit facility is not subject to NSPS.
NESHAPS	The Steam Methane Reformer Unit facility is subject to NESHAPS.
MACT	The Steam Methane Reformer Unit facility is not subject to MACT.

Federal Regulatory Requirements (Continued)

§116.111(a)(2)(H) Nonattainment New Source Review: NOx and VOC

Requirement	"If the proposed facility is located in a nonattainment area, it shall comply with all applicable requirements in this chapter concerning nonattainment review."
Applicability	**There are VOC emission increases associated with this permit action. The Steam Reformer Unit will comply with all applicable requirements.**

§116.111(a)(2)(I) Prevention of Significant Deterioration Applicability Review

Requirement	"If the proposed facility is located in an attainment area, it shall comply with all applicable requirements in this chapter concerning PSD review."
Applicability	**The proposed project does not require Prevention of Significant Deterioration (PSD) review for CO, NOx, PM, and/or SO_2.**

§116.111(a)(2)(K) Hazardous Air Pollutants Review

Requirement	"Affected sources (as defined in § 116.15(1) of this title (relating to Section 112(g) Definitions)) for hazardous air pollutants shall comply with all applicable requirements under Subchapter C of this chapter (relating to Hazardous Air Pollutants: Regulations Governing Constructed or Reconstructed Major Sources (FCAA, § 112(g), 40 CFR Part 63))."
Applicability	**The proposed project does not create or modify an affected source according to the definitions above.**

Permit Fee Information

Permit fee submission	Air Products LLC sent the following permit fees directly to TCEQ's Financial Division for the permit amendment. In addition, Air Products LLC sent a copy of the PI-1 General Application Workbook – Fees Tab to the TCEQ's Financial Division.

PI-1 General Application Workbook Tabs

In this section

The following section includes the pages from the NSR workbook to support this application.

Texas Commission on Environmental Quality
Form PI-1 General Application
General

I. Applicant Information	
I acknowledge that I am submitting an authorized TCEQ application workbook and any necessary attachments. Except for inputting the requested data and adjusting row height and column width, I have not changed the TCEQ application workbook in any way, including but not limited to changing formulas, formatting, content, or protections.	I agree

A. Company Information

Company or Legal Name:	Air Products LLC

Permits are issued to either the facility owner or operator, commonly referred to as the applicant or permit holder. List the legal name of the company, corporation, partnership, or person who is applying for the permit. We will verify the legal name with the Texas Secretary of State at (512) 463-5555 or at:

https://www.sos.state.tx.us

Texas Secretary of State Charter/Registration Number (if given):	

B. Company Official Contact Information: must not be a consultant

Prefix (Mr., Ms., Dr., etc.):	Mr.
First Name:	Kenneth
Last Name:	Miller
Title:	HYCO Area Manager
Mailing Address:	10202 Strang Road
Address Line 2:	
City:	La Porte
State:	Texas
ZIP Code:	77571
Telephone Number:	281-478-3005
Fax Number:	
Email Address:	millerkr@airproducts.com

C. Technical Contact Information: This person must have the authority to make binding agreements and representations on behalf of the applicant and may be a consultant. **Additional technical contact(s) can be provided in a cover letter.**

Prefix (Mr., Ms., Dr., etc.):	Ms.
First Name:	Tammy
Last Name:	Grover
Title:	Lead Environmental Engineer
Company or Legal Name:	Air Products LLC
Mailing Address:	10202 Strang Road
Address Line 2:	
City:	La Porte
State:	Texas
ZIP Code:	77571
Telephone Number:	281-478-3172
Fax Number:	
Email Address:	grovertb@airproducts.com

D. Assigned Numbers

The CN and RN below are assigned when a Core Data Form is initially submitted to the Central Registry. The RN is also assigned if the agency has conducted an investigation or if the agency has issued an enforcement action. If these numbers have not yet been assigned, leave these questions blank and include a Core Data Form with your application submittal. See Section VI.B. below for additional information.

Enter the CN. The CN is a unique number given to each business, governmental body, association, individual, or other entity that owns, operates, is responsible for, or is affiliated with a regulated entity.	CN602299257
Enter the RN. The RN is a unique agency assigned number given to each person, organization, place, or thing that is of environmental interest to us and where regulated activities will occur. The RN replaces existing air account numbers. The RN for portable units is assigned to the unit itself, and that same RN should be used when applying for authorization at a different location.	RN100221324

II. Delinquent Fees and Penalties	
Does the applicant have unpaid delinquent fees and/or penalties owed to the TCEQ? This form will not be processed until all delinquent fees and/or penalties owed to the TCEQ or the Office of the Attorney General on behalf of the TCEQ are paid in accordance with the Delinquent Fee and Penalty Protocol. For more information regarding Delinquent Fees and Penalties, go to the TCEQ Web site at: https://www.tceq.texas.gov/agency/financial/fees/delin	No

III. Permit Information

A. Permit and Action Type **(multiple may be selected, leave no blanks)**

Additional information regarding the different NSR authorizations can be found at:
https://www.tceq.texas.gov/permitting/air/guidance/authorize.html

Select from the drop-down the type of action being requested for each permit type. **If that permit type does not apply, you MUST select "Not applicable".**

Provide all assigned permit numbers relevant for the project. Leave blank if the permit number has not yet been assigned.

Permit Type	Action Type Requested (do not leave blank)	Permit Number (if assigned)
Minor NSR (can be a Title V major source): *Not applicable, Initial, Amendment, Renewal, Renewal Certification, Renewal/Amendment, Relocation/Alteration, Change of Location, Alteration, Extension to Start of Construction*	Amendment	27773
Special Permit: *Not applicable, Amendment, Renewal, Renewal Certification, Renewal/Amendment, Alteration, Extension to Start of Construction*	Not applicable	
De Minimis: *Not applicable, Initial*	Not applicable	
Flexible: *Not applicable, Initial, Amendment, Renewal, Renewal Certification, Renewal/Amendment, Alteration, Extension to Start of Construction*	Not applicable	
PSD: *Not applicable, Initial, Major Modification*	Not applicable	
Nonattainment: *Not applicable, Initial, Major Modification*	Not applicable	
HAP Major Source [FCAA § 112(g)]: *Not applicable, Initial, Major Modification*	Not applicable	
PAL: *Not applicable, Initial, Amendment, Renewal, Renewal/Amendment, Alteration*	Not applicable	
GHG PSD: *Not applicable, Initial, Major Modification, Voluntary Update*	Not applicable	

B. MSS Activities

How are/will MSS activities for sources associated with this project be authorized?	This permit

C. Consolidating NSR Permits

Will this permit be consolidated into another NSR permit with this action?	No
Will NSR permits be consolidated into this permit with this action?	No

D. Incorporation of Standard Permits, Standard Exemptions, and/or Permits By Rule (PBR)

To ensure protectiveness, previously issued authorizations (standard permits, standard exemptions, or PBRs) including those for MSS, are incorporated into a permit either by consolidation or by reference. At the time of renewal and/or amendment, consolidation (in some cases) may be voluntary and referencing is mandatory. More guidance regarding incorporation can be found in 30 TAC § 116.116(d)(2), 30 TAC § 116.615(3) and in this memo:

https://www.tceq.texas.gov/assets/public/permitting/air/memos/pbr_spc06.pdf

Are there any standard permits, standard exemptions, or PBRs to be incorporated by reference?	No
Are there any PBR, standard exemptions, or standard permits associated to be incorporated by consolidation? **Note:** Emission calculations, a BACT analysis, and an impacts analysis must be attached to this application at the time of submittal for any authorization to be incorporated by consolidation.	No

E. Associated Federal Operating Permits

Is this facility located at a site required to obtain a **site operating permit (SOP)** or **general operating permit (GOP)?**	Yes
Is a **SOP** or **GOP** review pending for this source, area, or site?	No
If required to obtain a **SOP** or **GOP**, list all associated permit number(s). If no associated permit number has been assigned yet, enter "TBD":	O2309

IV. Facility Location and General Information

A. Location

County: Enter the county where the facility is physically located.	Harris
TCEQ Region	Region 12
County attainment status as of Sept. 23, 2019	Serious Ozone nonattainment
Street Address:	1435 Pasadena Fwy
City: If the address is not located in a city, then enter the city or town closest to the facility, even if it is not in the same county as the facility.	Pasadena
ZIP Code: Include the ZIP Code of the physical facility site, not the ZIP Code of the applicant's mailing address.	77501
Site Location Description: If there is no street address, provide written driving directions to the site. Identify the location by distance and direction from well-known landmarks such as major highway intersections.	Not applicable
Use USGS maps, county maps prepared by the Texas Department of Transportation, or an online software application such as Google Earth to find the latitude and longitude.	
Latitude (in degrees, minutes, and nearest second (DDD:MM:SS)) for the street address or the destination point of the driving directions. Latitude is the angular distance of a location north of the equator and will always be between 25 and 37 degrees north (N) in Texas.	029:43:02
Longitude (in degrees, minutes, and nearest second (DDD:MM:SS)) for the street address or the destination point of the driving directions. Longitude is the angular distance of a location west of the prime meridian and will always be between 93 and 107 degrees west (W) in Texas.	095:11:27
Is this a project for a lead smelter, concrete crushing facility, and/or a hazardous waste management facility?	No

B. General Information

Site Name:	Steam Methane Reformer Unit
Area Name: Must indicate the general type of operation, process, equipment or facility. Include numerical designations, if appropriate. Examples are Sulfuric Acid Plant and No. 5 Steam Boiler. Vague names such as Chemical Plant are not acceptable.	Steam Methane Reformer (SMR) Unit
Are there any schools located within 3,000 feet of the site boundary?	No

C. Portable Facility

Permanent or portable facility?	Permanent
D. Industry Type	
Principal Company Product/Business:	Chemical
A list of SIC codes can be found at: https://www.naics.com/sic-codes-industry-drilldown/	
Principal SIC code:	2813
NAICS codes and conversions between NAICS and SIC Codes are available at: https://www.census.gov/eos/www/naics/	
Principal NAICS code:	325120
E. State Senator and Representative for this site	
This information can be found at (note, the website is not compatible to Internet Explorer): https://wrm.capitol.texas.gov/	
State Senator:	Senator Carol Alvarado
District:	6
State Representative:	Representative Mary Ann Perez
District:	144

V. Project Information	
A. Description	
Provide a brief description of the project that is requested. (Limited to 500 characters).	Air Products is amending the permit to increase emissions of VOC and ammonia for EPN: SMR-SVENT.
B. Project Timing	
Authorization must be obtained for many projects before beginning construction. Construction is broadly interpreted as anything other than site clearance or site preparation. Enter the date as "Month Date, Year" (e.g. July 4, 1776).	
Projected Start of Construction:	November 1, 2021
Projected Start of Operation:	November 1, 2021
C. Enforcement Projects	
Is this application in response to, or related to, an agency investigation, notice of violation, or enforcement action?	No
D. Operating Schedule	
Will sources in this project be authorized to operate 8760 hours per year?	Yes

VI. Application Materials	
All representations regarding construction plans and operation procedures contained in the permit application shall be conditions upon which the permit is issued. (30 TAC § 116.116)	
A. Confidential Application Materials	
Is confidential information submitted with this application?	Yes
If yes, is each confidential page marked "CONFIDENTIAL" in large red letters?	Yes
THSC §382.041 requires us not to disclose any information related to manufacturing processes that is marked Confidential. Mark any information related to secret or proprietary processes or methods of manufacture Confidential if you do not want this information in the public file. All confidential information should be separated from the application and submitted as a separate file. Additional information regarding confidential information can be found at: https://www.tceq.texas.gov/permitting/air/confidential.html	
B. Is the Core Data Form (Form 10400) attached?	Yes
https://www.tceq.texas.gov/assets/public/permitting/centralregistry/10400.docx	
C. Is a current area map attached?	Yes
Is the area map a current map with a true north arrow, an accurate scale, the entire plant property, the location of the property relative to prominent geographical features including, but not limited to, highways, roads, streams, and significant landmarks such as buildings, residences, schools, parks, hospitals, day care centers, and churches?	Yes
Does the map show a 3,000-foot radius from the property boundary?	Yes
D. Is a plot plan attached?	Yes
Does your plot plan clearly show a north arrow, an accurate scale, all property lines, all emission points, buildings, tanks, process vessels, other process equipment, and two bench mark locations?	Yes

Does your plot plan identify all emission points on the affected property, including all emission points authorized by other air authorizations, construction permits, PBRs, special permits, and standard permits?	Yes
Did you include a table of emission points indicating the authorization type and authorization identifier, such as a permit number, registration number, or rule citation under which each emission point is currently authorized?	Yes
E. Is a process flow diagram attached?	Yes
Is the process flow diagram sufficiently descriptive so the permit reviewer can determine the raw materials to be used in the process; all major processing steps and major equipment items; individual emission points associated with each process step; the location and identification of all emission abatement devices; and the location and identification of all waste streams (including wastewater streams that may have associated air emissions)?	Yes
F. Is a process description attached?	Yes
Does the process description emphasize where the emissions are generated, why the emissions must be generated, what air pollution controls are used (including process design features that minimize emissions), and where the emissions enter the atmosphere?	Yes
Does the process description also explain how the facility or facilities will be operating when the maximum possible emissions are produced?	Yes
G. Are detailed calculations attached? Calculations must be provided for each source with new or changing emission rates. For example, a new source, changing emission factors, decreasing emissions, consolidated sources, etc. You do not need to submit calculations for sources which are not changing emission rates with this project. Please note: the preferred format is an electronic workbook (such as Excel) with all formulas viewable for review. It can be emailed with the submittal of this application workbook.	Yes
Are emission rates and associated calculations for planned MSS facilities and related activities attached?	N/A
H. Is a material balance (Table 2, Form 10155) attached?	N/A
I. Is a list of MSS activities attached?	N/A
J. Is a discussion of state regulatory requirements attached, addressing 30 TAC Chapters 101, 111, 112, 113, 115, and 117?	Yes
For all applicable chapters, does the discussion include how the facility will comply with the requirements of the chapter?	Yes
For all not applicable chapters, does the discussion include why the chapter is not applicable?	Yes
K. Are all other required tables, calculations, and descriptions attached?	Yes

VII. Signature

The owner or operator of the facility must apply for authority to construct. The appropriate company official (owner, plant manager, president, vice president, or environmental director) must sign all copies of the application. The applicant's consultant cannot sign the application. **Important Note: Signatures must be original in ink, not reproduced by photocopy, fax, or other means, and must be received before any permit is issued.**

The signature below confirms that I have knowledge of the facts included in this application and that these facts are true and correct to the best of my knowledge and belief. I further state that to the best of my knowledge and belief, the project for which application is made will not in any way violate any provision of the Texas Water Code (TWC), Chapter 7; the Texas Health and Safety Code, Chapter 382; the Texas Clean Air Act (TCAA); the air quality rules of the Texas Commission on Environmental Quality; or any local governmental ordinance or resolution enacted pursuant to the TCAA. I further state that I understand my signature indicates that this application meets all applicable nonattainment, prevention of significant deterioration, or major source of hazardous air pollutant permitting requirements. The signature further signifies awareness that intentionally or knowingly making or causing to be made false material statements or representations in the application is a criminal offense subject to criminal penalties.

Name:	Kenneth Miller
Signature:	
Original signature is required.	
Date:	

E. Concrete Batch Plants

Is this a project for a concrete batch plant?	No

IX. Emissions Review	
A. Impacts Analysis	
Any change that results in an increase in off-property concentrations of air contaminants requires an air quality impacts demonstration. Information regarding the air quality impacts demonstration must be provided with the application and show compliance with all state and federal requirements. Detailed requirements for the information necessary to make the demonstration are listed on the Impacts sheet of this workbook.	
Does this project require an impacts analysis?	Yes
B. Disaster Review	
If the proposed facility will handle sufficient quantities of certain chemicals which, if released accidentally, would cause off-property impacts that could be immediately dangerous to life and health, a disaster review analysis may be required as part of the application. Contact the appropriate NSR permitting section for assistance at (512) 239-1250. Additional Guidance can be found at:	
https://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/disrev-factsheet.pdf	
Does this application involve any air contaminants for which a disaster review is required?	No
C. Air Pollutant Watch List	
Certain areas of the state have concentrations of specific pollutants that are of concern. The TCEQ has designated these portions of the state as watch list areas. Location of a facility in a watch list area could result in additional restrictions on emissions of the affected air pollutant(s) or additional permit requirements. The location of the areas and pollutants of interest can be found at:	
https://www.tceq.texas.gov/toxicology/apwl/apwl.html	
Is the proposed facility located in a watch list area?	No
D. Mass Emissions Cap and Trade	
Is this facility located at a site within the Houston/Galveston nonattainment area (Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller Counties)?	Yes
Is Mass Emissions Cap and Trade applicable to the new or modified facilities?	No

X. Additional Requirements	
A. Bulk Fuel Terminals	
Is this project for a bulk fuel terminal?	No
B. Plant Fuel Gas Facilities	
Does this site utilize plant fuel gas?	No

Texas Commission on Environmental Quality
Form PI-1 General Application
Unit Types - Emission Rates

Date: December 2020
Permit #: 27773
Company: Air Products LLC

Permit primary industry (must be selected for workbook to function)	Chemical / Energy

Action Requested (only 1 action per FIN)	Include these emissions in annual (tpy) summary?	Facility ID Number (FIN)	Emission Point Number (EPN)	Source Name	Pollutant	Current Short-Term (lb/hr)	Current Long-Term (tpy)	Consolidated Current Short-Term (lb/hr)	Consolidated Current Long-Term (tpy)	Proposed Short-Term (lb/hr)	Proposed Long-Term (tpy)	Short-Term Difference (lb/hr)	Long-Term Difference (tpy)	Unit Type (Used for reviewing BACT and Monitoring Requirements)	Unit Type Notes (only if "other" unit type in Column O)
Not New/Modified	Yes	SMR	SMR-1	Reformer Furnace Stack	VOC	1.12	4.5			1.12	4.5	0	0	Furnace	
					CO	18.85	30			18.85	30	0	0		
					NH3	10.4	45.6			10.4	45.6	0	0		
					NOx	40	39.93			40	39.93	0	0		
					PM	7.35	29.6			7.35	29.6	0	0		
					PM10	7.35	29.6			7.35	29.6	0	0		
					PM2.5	7.35	29.6			7.35	29.6	0	0		
					SO2	2.4	10.51			2.4	10.51	0	0		
Not New/Modified	Yes	SMR-2	SMR-2	Flare	CO	3.5	15.4			3.5	15.4	0	0	Control: Flare	
					NOx	1.3	5.56			1.3	5.56	0	0		
					SO2	0.01	0.03			0.01	0.03	0	0		
					VOC	0.01	0.04			0.01	0.04	0	0		
Not New/Modified	Yes	SMR-2MSS	SMR-2MSS	Flare Start-up, Shutdown and Maintenance	CO	476.5	17.93			476.5	17.93	0	0	MSS Activities	
					NOx	123.7	4.39			123.7	4.39	0	0		
					SO2	0.25	0.01			0.25	0.01	0	0		
					VOC	2.53	0.01			2.53	0.01	0	0		
Not New/Modified	Yes	SMR-3	SMR-3	Fugitives	CO	1.08	4.75			1.08	4.75	0	0	Fugitives: Piping and Equipment Leak	
					NH3	0.03	0.11			0.03	0.11	0	0		
					VOC	0.12	0.53			0.12	0.53	0	0		
Not New/Modified	Yes	SMR	H2VENT	Hydrogen Vent	CO	5.91	0.91			5.91	0.91	0	0	Process Vent	
Not New/Modified	Yes	PDEGASTAU, INS4, INS5, INS6, INS7	PDEGASTAU	Planned Maintenance	CO	1.78	0.22			1.78	0.22	0	0	MSS Activities	
					VOC	0.93	0.01			0.93	0.01	0	0		
Not New/Modified	Yes	INS13, INS14	INS-B	Aqueous Ammonia Pump Maintenance and Repair	NH3	0.02	0.01			0.02	0.01	0	0	MSS Activities	
Not New/Modified	Yes	INS1, INS3, INS10	INS-A	Inherently Low Emitting Maintance	VOC	0.01	0.01			0.01	0.01	0	0	MSS Activities	
					CO	0.01	0.01			0.01	0.01	0	0		
					NH3	0.69	0.01			0.69	0.01	0	0		
New/Modified	Yes	SMR	SMR-SVENT	SMR Steam Vent	VOC	10.36	3			13.87	23.84	*3.51*	*20.84*	Process Vent	
					NH3	1.39	2.61			7.32	17.42	*5.93*	*14.81*		

Texas Commission on Environmental Quality
Form PI-1 General Application
Stack Parameters

Emission Point Discharge Parameters												
EPN	Included in EMEW?	UTM Coordinates Zone	East (Meters)	North (Meters)	Building Height (ft)	Height Above Ground (ft)	Stack Exit Diameter (ft)	Velocity (FPS)	Temperature (°F)	Fugitives - Length (ft)	Fugitives - Width (ft)	Fugitives - Axis Degrees
SMR-1	No	15	287648	3289108		120	10	55	300	75	45	0
SMR-2	No	15	287603	3289162		100						
SMR-2MSS	No	15	287649	3289136		100	3	24.38	1832			
SMR-3	Yes											
H2VENT	No	15	287675	3289134						150	100	0
PDEGASTAU	No	15	287719	3289378		10	0.00328	0.00328	Ambient			
INS-B	No	15	287649	3289136		10	0.00328	0.00328	Ambient			
INS-A	No	15	287649	3289136		10	0.00328	0.00328	Ambient			
SMR-SVENT	No	15	287672	3289345		10	0.00328	0.00328	Ambient			

I. Public Notice Applicability	
A. Application Type	
Is this an application for a minor permit amendment?	Yes
Is there any change in character of emissions in this application (a new criteria pollutant or a new VOC or PM species)?	No
Is there a new air contaminant in this application?	No

B. Project Increases and Public Notice Thresholds (for Initial and Amendment Projects)

For public notice applicability, the agency does not include consolidation or incorporation of any previously authorized facility or activity (PBR, standard permits, etc.), changes to permitted allowable emission rates when exclusively due to changes to standardized emission factors, or reductions in emissions which are not enforceable through the amended permit. Thus, the total emissions increase would be the sum of emissions increases under the amended permit and the emissions decreases under the amended permit for each air contaminant.

The table below will generate emission increases based on the values represented on the "Unit Types - Emission Rates" sheet. Use the "yes" and "no" options in column B of the "Unit Types - Emission Rates" worksheet to indicate if a unit's proposed change of emissions should be included in these totals.

Notes:

1. Emissions of PM, PM10, and/or PM2.5 may have been previously quantified and authorized as PM, PM10,and/or PM2.5. These emissions will be speciated based on current guidance and policy to demonstrate compliance with current standards and public notice requirements may change during the permit review.

2. All renewals require public notice.

This row is optional. If you do not think the table below accurately represents public notice applicability increases for your project, provide discussion here (1000 characters).	
Do the facilities handle, load, unload, dry, manufacture, or process grain, seed, legumes, or vegetable fibers (agricultural facilities)?	No

Pollutant	Current Long-Term (tpy)	Consolidated Emissions (tpy)	Proposed Long-Term (tpy)	Project Change in Allowable (tpy)	PN Threshold	Notice required?
VOC	8.10	0.00	28.94	20.84	5	Yes
PM	29.60	0.00	29.60	0.00	5	No
PM_{10}	29.60	0.00	29.60	0.00	5	No
$PM_{2.5}$	29.60	0.00	29.60	0.00	5	No
NO_x	49.88	0.00	49.88	0.00	5	No
CO	69.22	0.00	69.22	0.00	50	No
SO_2	10.55	0.00	10.55	0.00	10	No
Pb	0.00	0.00	0.00	0.00	0.6	No
NH3	48.34	0	63.15	14.81	5	Yes

* Notice is required for PM, PM10, and PM2.5 if one of these pollutants is above the threshold.

** Notice of a GHG action is determined by action type. Initial and major modification always require notice. Voluntary updates require a consolidated notice if there is a change to BACT. Project emission increases of CO2e (CO2 equivalent) are not relevant for determining public notice of GHG permit actions.

C. Is public notice required for this project as represented in this workbook? If no, proceed to Section III Small Business Classification. Note: public notice applicability for this project may change throughout the technical review.	Yes
D. Are any HAPs to be authorized/re-authorized with this project? The category "HAPs" must be specifically listed in the public notice if the project authorizes (reauthorizes for renewals) any HAP pollutants.	No

II. Public Notice Information	
Complete this section if public notice is required (determined in the above section) or if you are not sure if public notice is required.	
A. Contact Information	
Enter the contact information for the **person responsible for publishing.** This is a designated representative who is responsible for ensuring public notice is properly published in the appropriate newspaper and signs are posted at the facility site. This person will be contacted directly when the TCEQ is ready to authorize public notice for the application.	
Prefix (Mr., Ms., Dr., etc.):	Ms.
First Name:	Tammy
Last Name:	Grover
Title:	Lead Environmental Engineer
Company Name:	Air Products LLC
Mailing Address:	10202 Strang Road
Address Line 2:	
City:	La Porte
State:	Texas
ZIP Code:	77571
Telephone Number:	281-478-3172
Fax Number:	
Email Address:	grovertb@airproducts.com
Enter the contact information for the **Technical Contact.** This is the designated representative who will be listed in the public notice as a contact for additional information.	
Prefix (Mr., Ms., Dr., etc.):	Ms.
First Name:	Tammy
Last Name:	Grover
Title:	Lead Environmental Engineer
Company Name:	Air Products LLC
Mailing Address:	10202 Strang Road
Address Line 2:	
City:	La Porte
State:	Texas
ZIP Code:	77571
Telephone Number:	281-478-3172
Fax Number:	
Email Address:	grovertb@airproducts.com

B. Public place

Place a copy of the full application (including all of this workbook and all attachments) at a public place in the county where the facilities are or will be located. You must state where in the county the application will be available for public review and comment. The location must be a public place and described in the notice. A public place is a location which is owned and operated by public funds (such as libraries, county courthouses, city halls) and cannot be a commercial enterprise. You are required to pre-arrange this availability with the public place indicated below. The application must remain available from the first day of publication through the designated comment period.

If this is an application for a PSD, nonattainment, or FCAA §112(g) permit, the public place must have internet access available for the public as required in 30 TAC § 39.411(f)(3).

If the application is submitted to the agency with information marked as Confidential, you are required to indicate which specific portions of the application are not being made available to the public. These portions of the application must be accompanied with the following statement: ***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 TCEQ Public Information Coordinator, MC 197, P.O. Box 13087, Austin, Texas 78711-3087.***

Name of Public Place:	Pasadena Public Library
Physical Address:	1201 Jeff Ginn Memorial Drive
Address Line 2:	
City:	Pasadena
ZIP Code:	77501
County:	Harris
Has the public place granted authorization to place the application for public viewing and copying?	Yes

C. Alternate Language Publication

In some cases, public notice in an alternate language is required. If an elementary or middle school nearest to the facility is in a school district required by the Texas Education Code to have a bilingual program, a bilingual notice will be required. If there is no bilingual program required in the school nearest the facility, but children who would normally attend those schools are eligible to attend bilingual programs elsewhere in the school district, the bilingual notice will also be required. If it is determined that alternate language notice is required, you are responsible for ensuring that the publication in the alternate language is complete and accurate in that language.

Is a bilingual program required by the Texas Education Code in the School District?	Yes
Are the children who attend either the elementary school or the middle school closest to your facility eligible to be enrolled in a bilingual program provided by the district?	Yes
If yes to either question above, list which language(s) are required by the bilingual program?	Spanish

III. Small Business Classification

Complete this section to determine small business classification. If a small business requests a permit, agency rules (30 TAC § 39.603(f)(1)(A)) allow for alternative public notification requirements if all of the following criteria are met. If these requirements are met, public notice does not have to include publication of the prominent (12 square inch) newspaper notice.

Does the company (including parent companies and subsidiary companies) have fewer than 100 employees or less than $6 million in annual gross receipts?	No
Small business classification:	**No**

I. County Classification	
Does the project require retrospective review?	No
County (completed for you from your response on the General sheet)	Harris
This project will be located in an area that is in serious nonattainment for ozone as of Sept. 23, 2019. Select from the drop-down list to the right if you would like the project to be reviewed under a different classification.	Ozone - Serious
Determination:	**This project will be located in a county with a Serious Ozone nonattainment classification, and the project will be reviewed under a Serious Ozone nonattainment classification. Complete the nonattainment section below and provide an analysis with the application.**

II. PSD and GHG PSD Applicability Summary			
Is netting required for the PSD analysis for this project?			**No**
Pollutant	**Project Increase**	**Threshold**	**PSD Review Required?**
CO	0	100	No
NO_x	0	40	No
PM	0	25	No
PM_{10}	0	15	No
$PM_{2.5}$	0	10	No
SO_2	0	40	No
Pb	0	0.6	No
H_2S	0	10	No
TRS	0	10	No
Reduced sulfur compounds (including H_2S)	0	10	No
H_2SO_4	0	7	No
Fluoride (excluding HF)	0	3	No
CO2e	0	75000	No

III. Nonattainment Applicability Summary			
Is netting required for the nonattainment analysis for this project?			**Yes**
If yes, the project increases listed below should be after netting has been performed. Attach the netting information to the application.			
Pollutant	**Project Increase (after netting)**	**Threshold**	**NA Review Required?**
Ozone (as VOC)	20.97	25	No
Ozone (as NO_x)	0	25	No

IV. Offset Summary (for Nonattainment Permits)			
Pollutant	**Offset Ratio**	**Offset Quantity Required (tpy)**	**Where is the offset coming from?**

I. General Information - Non-Renewal	
Is this project for new facilities controlled and operated directly by the federal government? (30 TAC § 116.141(b)(1) and 30 TAC § 116.163(a))	No
A fee of $75,000 shall be required if no estimate of capital project cost is included with the permit application. (30 TAC § 116.141(d)) Select "yes" here to use this option. Then skip sections II and III.	No
Select Application Type	Minor Application

II. Direct Costs - Non-Renewal	
Type of Cost	**Amount**
Process and control equipment not previously owned by the applicant and not currently authorized under this chapter.	$0.00
Auxiliary equipment, including exhaust hoods, ducting, fans, pumps, piping, conveyors, stacks, storage tanks, waste disposal facilities, and air pollution control equipment specifically needed to meet permit and regulation requirements.	$0.00
Freight charges.	$0.00
Site preparation, including demolition, construction of fences, outdoor lighting, road, and parking areas.	$0.00
Installation, including foundations, erection of supporting structures, enclosures or weather protection, insulation and painting, utilities and connections, process integration, and process control equipment.	$0.00
Auxiliary buildings, including materials storage, employee facilities, and changes to existing structures.	$0.00
Ambient air monitoring network.	$0.00
Sub-Total:	$0.00

III. Indirect Costs - Non-Renewal	
Type of Cost	**Amount**
Final engineering design and supervision, and administrative overhead.	$0.00
Construction expense, including construction liaison, securing local building permits, insurance, temporary construction facilities, and construction clean-up.	$0.00
Contractor's fee and overhead.	$0.00
Sub-Total:	$0.00

IV. Calculations - Non-Renewal

For GHG permits: A single PSD fee (calculated on the capital cost of the project per 30 TAC § 116.163) will be required for all of the associated permitting actions for a GHG PSD project. Other NSR permit fees related to the project that have already been remitted to the TCEQ can be subtracted when determining the appropriate fee to submit with the GHG PSD application. Identify these other fees in the GHG PSD permit application.

In signing the "General" sheet with this fee worksheet attached, I certify that the total estimated capital cost of the project as defined in 30 TAC §116.141 is equal to or less than the above figure. I further state that I have read and understand Texas Water Code § 7.179, which defines Criminal Offenses for certain violations, including intentionally or knowingly making, or causing to be made, false material statements or representations.

Estimated Capital Cost	Minor Application Fee
Less than $300,000	$900 (minimum fee)
$300,000 - $7,500,000	N/A
$300,000 - $25,000,000	0.30% of capital cost
Greater than $7,500,000	N/A
Greater than $25,000,000	$75,000 (maximum fee)

Your estimated capital cost:	**$0.00**	Minimum fee applies.
Permit Application Fee:		**$900.00**

VI. Total Fees	
Note: fees can be paid together with one payment or as two separate payments.	
Non-Renewal Fee	$900.00
Total	$900.00

VII. Payment Information		
A. Payment One (required)		
Was the fee paid online?		Yes
Enter the fee amount:		$ 900.00
Enter the check, money order, ePay Voucher, or other transaction number:	4808017019654540	
Enter the Company name as it appears on the check:	AECOM	
C. Total Paid		**$900.00**

VIII. Professional Engineer Seal Requirement	
Is the estimated capital cost of the project above $2 million?	No
Is the application required to be submitted under the seal of a Texas licensed P.E.? Note: an electronic PE seal is acceptable.	No

Pollutant	Does this pollutant require PSD review?	How will you demonstrate that this project meets all applicable requirements?	Notes	Additional Notes (optional)
VOC	No	Modeling: screen or refined	Attach a completed "Electronic Modeling Evaluation Workbook" (EMEW).	
CO	No	Not applicable	This pollutant is not a part of this project or does not require an impacts analysis.	
NH3	No	Modeling: screen or refined	Attach a completed "Electronic Modeling Evaluation Workbook" (EMEW).	
NOx	No	Not applicable	This pollutant is not a part of this project or does not require an impacts analysis.	
PM	No	Not applicable	This pollutant is not a part of this project or does not require an impacts analysis.	
PM10	No	Not applicable	This pollutant is not a part of this project or does not require an impacts analysis.	
PM2.5	No	Not applicable	This pollutant is not a part of this project or does not require an impacts analysis.	
SO2	No	Not applicable	This pollutant is not a part of this project or does not require an impacts analysis.	

Plant Type	Current Tier I BACT	Confirm	Additional Notes

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	SMR	Process Vent	VOC	Non-halogenated VOCs: flare, any oxidizer, adsorber, absorber/scrubber, etc. Specify technique. Must meet that control device's approved efficiency. Halogenated VOC: Thermal oxidation followed by absorber/scrubber carbon adsorption. Specify technique. Must meet that control device's approved efficiency.	Yes	Vent gas stream sampling measured a concentration of around 64 ppm (total of methanol and ethanol), this concentration represents around 10% of the maximum allowable concentration for control exemption under §115.127. The concentration of VOC in the stream is so low, additional control is not required.
			NH3	See Additional Notes:	Yes	There is no established TCEQ BACT for this type of process vent emitting ammonia. Therefore, no control is accepted as BACT for the ammonia increase (5.93 lb/hr & 14.81 tpy) from this vent.
			MSS	Same as normal operation BACT requirements.	Yes	

Texas Commission on Environmental Quality
Form PI-1 General Application
Monitoring

Monitoring

This sheet provides the minimum acceptable requirements to demonstrate compliance through monitoring for each pollutant proposed to be emitted from each FIN. This sheet also includes measuring techniques for sources of significant emissions in the project.

Instructions:
1. The unit types listed under Unit Type (column B) include all new, modified, consolidated, and/or renewed sources as indicated on the "Unit Types - Emission Rates" sheet. Each new, modified, consolidated, and/or renewed source must address how compliance will be demonstrated.
2. The pollutants listed in Pollutant (column C) include the pollutants indicated on the "Unit Types - Emission Rates" sheet.

Monitoring (30 TAC § 116.111(a)(2)(G))
3. The minimum acceptable monitoring is automatically populated for each unit type and pollutant.
   - Additional monitoring may be required, particularly for Title V sources, and will be included in the NSR and/or Title V permits.
4. Fully expand the Minimum Monitoring Requirements (column D) by increasing the row heights so all text is visible. (Place the cursor on the bottom of the number line to the far left of the screen, click and drag downward until all text is visible.)
5. Review the monitoring and confirm that you will meet all representations listed on the sheet and any additional attachments by entering or selecting "Yes" in Confirm (column E).
6. Add additional notes as necessary in Additional Notes for Monitoring (column F), limited to 500 characters or fewer. Examples include the following:
   - Proposed monitoring for pollutants or units that list "See additional notes:";
   - Details requested in the populated data;
   - Alternative monitoring you are proposing; and
   - Any additional information relevant to the minimization of emissions.
7. Cap EPNs do not need monitoring (leave those rows blank).

Measurement of Emissions (30 TAC § 116.111(a)(2)(B))
Note: this section will be greyed out if this project does not require PSD or nonattainment review, as represented on the General sheet.
7. For each pollutant with a project increase **greater** than the PSD significant emission rate, select the proposed measurement technique using the dropdown (column G).
8. For each pollutant with a project increase **less** than the PSD significant emission rate: leave blank.
9. If selecting "other", provide details in Additional Notes for Measuring (column H).
10. You may also use the Additional Notes for Measuring (column H) to provide more details on a selection.

Click here to return to Cover Sheet.

Important Note: The permit holder shall maintain a copy of the permit along with records containing the information and data sufficient to demonstrate compliance with the permit, including production records and operating hours. All required records must be maintained in a file at the plant site. If, however, the facility normally operates unattended, records shall be maintained at the nearest staffed location within Texas specified in the application. The site must make the records available at the request of personnel from the commission or any air pollution control program having jurisdiction in a timely manner. The applicant must comply with any additional recordkeeping requirements specified in special conditions in the permit. All records must be retained in the file for at least two years following the date that the information or data is obtained. Some permits are required to maintain records for five years. [30 TAC § 116.115(b)(2)(E)]

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring	Proposed Measurement Technique (only complete for pollutants with a project increase above the PSD threshold)	Additional Notes for Measuring:
SMR	Process Vent	VOC	Production rate or flow as appropriate Monitoring consistent with Control Device	Yes			
		NH3	See Additional Notes:	Yes	A continuous flow monitor is being used to take readings every 15 minutes. An annual sample is taken for the ammonia content.		

Texas Commission on Environmental Quality
Form PI-1 General Application
Materials

Item	How submitted	Date submitted
A. Administrative Information		
Form PI-1 General Application	STEERS	12/17/2020
Hard copy of the General sheet with original (ink) signature	STEERS	12/17/2020
Professional Engineer Seal	Not applicable	
B. General Information		
Copy of current permit (both Special Conditions and MAERT)		
Core Data Form	STEERS	12/17/2020
Area map	STEERS	12/17/2020
Plot plan	STEERS	12/17/2020
Process description	STEERS	12/17/2020
Process flow diagram	STEERS	12/17/2020
List of MSS activities		
State regulatory requirements discussion	STEERS	12/17/2020
C. Federal Applicability		
Summary and project emission increase determination - Tables 1F and 2F	STEERS	12/17/2020
Netting analysis (if required) - Tables 3F and 4F as needed	STEERS	12/17/2020
D. Technical Information		
BACT discussion, if additional details are attached	STEERS	12/17/2020
Monitoring information, if additional details are attached	STEERS	12/17/2020
Material Balance (if applicable)		
Calculations	STEERS	12/11/2020
E. Impacts Analysis		
Qualitative impacts analysis	STEERS	12/17/2020
MERA analysis	STEERS	12/17/2020
Electronic Modeling Evaluation Workbook: SCREEN3	STEERS	12/17/2020
Electronic Modeling Evaluation Workbook: NonSCREEN3	STEERS	12/17/2020
PSD modeling protocol	STEERS	12/17/2020
F. Additional Attachments		

Appendices

Air Products LLC

Steam Methane Reformer Unit

NSR Permit No. 27773 Amendment Application

December 2020

APPENDICES

Overview

In this section

The following is a list of topics in this section. All confidential items are being submitted under a separate confidential cover.

Appendix A: Core Data Form

In this section The following is the updated Core Data From for the permit application.

TCEQ Use Only

TCEQ Core Data Form

For detailed instructions regarding completion of this form, please read the Core Data Form Instructions or call 512-239-5175.

SECTION I: General Information

1. Reason for Submission *(If other is checked please describe in space provided.)*

☐ New Permit, Registration or Authorization *(Core Data Form should be submitted with the program application.)*

☐ Renewal *(Core Data Form should be submitted with the renewal form)* ☒ Other **amendment**

2. Customer Reference Number *(if issued)*	Follow this link to search for CN or RN numbers in Central Registry**	3. Regulated Entity Reference Number *(if issued)*
CN 602299257		RN 100221324

SECTION II: Customer Information

4. General Customer Information	5. Effective Date for Customer Information Updates (mm/dd/yyyy)	12/8/2020

☐ New Customer ☒ Update to Customer Information ☐ Change in Regulated Entity Ownership

☐ Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)

The Customer Name submitted here may be updated automatically based on what is current and active with the Texas Secretary of State (SOS) or Texas Comptroller of Public Accounts (CPA).

6. Customer Legal Name *(If an individual, print last name first: eg: Doe, John)*	*If new Customer, enter previous Customer below:*
Air Products LLC	

7. TX SOS/CPA Filing Number	8. TX State Tax ID (11 digits)	9. Federal Tax ID (9 digits)	10. DUNS Number *(if applicable)*
706562523	32002289901	320066540	65091969

11. Type of Customer:	☒ Corporation	☐ Individual	Partnership: ☐ General ☐ Limited
Government: ☐ City ☐ County ☐ Federal ☐ State ☐ Other		☐ Sole Proprietorship	☐ Other:

12. Number of Employees	13. Independently Owned and Operated?
☐ 0-20 ☐ 21-100 ☐ 101-250 ☐ 251-500 ☒ 501 and higher	☒ Yes ☐ No

14. Customer Role (Proposed or Actual) – *as it relates to the Regulated Entity listed on this form. Please check one of the following*

☐ Owner ☐ Operator ☒ Owner & Operator

☐ Occupational Licensee ☐ Responsible Party ☐ Voluntary Cleanup Applicant ☐ Other:

15. Mailing Address:	1435 Pasadena Freeway						
	City	Pasadena	State	TX	ZIP	77506	ZIP + 4

16. Country Mailing Information *(if outside USA)*	17. E-Mail Address *(if applicable)*

18. Telephone Number	19. Extension or Code	20. Fax Number *(if applicable)*
(713) 740-7481		( ) -

SECTION III: Regulated Entity Information

21. General Regulated Entity Information *(If 'New Regulated Entity" is selected below this form should be accompanied by a permit application)*

☐ New Regulated Entity ☐ Update to Regulated Entity Name ☒ Update to Regulated Entity Information

The Regulated Entity Name submitted may be updated in order to meet TCEQ Agency Data Standards (removal of organizational endings such as Inc, LP, or LLC).

22. Regulated Entity Name *(Enter name of the site where the regulated action is taking place.)*

Air Products Pasadena Plant

23. Street Address of the Regulated Entity: *(No PO Boxes)*	1435 Pasadena Freeway							
	City	Pasadena	**State**	TX	**ZIP**	77506	**ZIP + 4**	
24. County								

Enter Physical Location Description if no street address is provided.

25. Description to Physical Location:					
26. Nearest City			**State**		**Nearest ZIP Code**

27. Latitude (N) In Decimal:			**28. Longitude (W) In Decimal:**		
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
29	42	58.13N	95	11	41.89W

29. Primary SIC Code (4 digits)	**30. Secondary SIC Code** (4 digits)	**31. Primary NAICS Code** (5 or 6 digits)	**32. Secondary NAICS Code** (5 or 6 digits)
2813		325120	

33. What is the Primary Business of this entity? *(Do not repeat the SIC or NAICS description.)*

Production of Industrial Gases

34. Mailing Address:	**1435 Pasadena Freeway**							
	City	**Pasadena**	**State**	**TX**	**ZIP**	**77506**	**ZIP + 4**	

35. E-Mail Address:		
36. Telephone Number	**37. Extension or Code**	**38. Fax Number** *(if applicable)*
(713) 740-7481		( ) -

39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form. See the Core Data Form instructions for additional guidance.

☐ Dam Safety	☐ Districts	☐ Edwards Aquifer	☒ Emissions Inventory Air	☒ Industrial Hazardous Waste
				TXD990757486
☐ Municipal Solid Waste	☒ New Source Review Air	☐ OSSF	☐ Petroleum Storage Tank	☐ PWS
	27773			
☐ Sludge	☒ Storm Water	☒ Title V Air	☐ Tires	☐ Used Oil
	WQ0002382000	O2309		
☐ Voluntary Cleanup	☐ Waste Water	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:

SECTION IV: Preparer Information

40. Name:	Tammy Grover	**41. Title:**	Lead Environmnetal Engineer

42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**
(281) 478-3172		( ) -	grovertb@airproducts.com

SECTION V: Authorized Signature

46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 6 and/or as required for the updates to the ID numbers identified in field 39.

Company:	Air Products and Chemicals, Inc.	**Job Title:**	Lead Environmental Engineer
Name *(In Print):*	Tammy Grover	**Phone:**	(281) 478- 3172
Signature:	Tammy Grover	**Date:**	12/8/20

Appendix B: Federal Applicability

Overview

In this section

The following additional confidential information is submitted with the permit application:

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

	VOC
Total of Increases only	**20.97**
PSD Significance Levels	
PSD Site Netting Supplied?	
Site Contemporaneous increase	
PSD Applicable?	
NNSR Significance Levels	**5**
NNSR Net Project Increase	**20.97**
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	23.84

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	20.97

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 **X 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]	20.97	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)	20.97						
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

TABLE 2F
PROJECT EMISSION INCREASE

Pollutant[1]:	Volatile Organic Compound (VOC)	**Permit:**	27773
Baseline Period:	N/A		

Affected or Modified Facilites[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	23.84		20.97		20.97
								Page Subtotal[9]		20.97
								Table Total		20.97

[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 CHANGES[1]

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

Project	Date[2]	Facility at Which Emission FIN	Facility at Which Emission EPN	Permit No.	Project Name or Activity	Baseline Period	A Baseline Emissions	B Proposed Emissions	Difference (B-A)[6]	Creditable Decrease or
1	12/1/2017	---	---	27773	NSR PERMIT NO. 27773 STEAM		0	-	-	-
									Page Subtotal[8]	0.00
									Project Emission Increase(from Table 2F)	20.97
Summary of Contemporaneous Changes									**Total (Includes Project Increases)**	20.97

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 Consturction - 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 maybe revised periodically. (APDG 5913v2)

Appendix C: Speciated Emission Rates

Overview

In this section

The following additional confidential information is submitted with the permit application:

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	0.77	11.56

Net Change Speciated VOC Emissions Limits, lb/hr

EPN	FIN	Description	Ammonia	Ethanol	Methanol
SMR-SVENT	STEAM	SMR Steam Vent	5.93	0.20	1.78
Net Hourly Change			5.93	0.20	1.78
Total of hourly Increases			5.93	0.20	1.78
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	0.92	22.93

Net Change Speciated VOC Emissions Limits, tpy

EPN	FIN	Description	Ammonia	Ethanol	Methanol
SMR-SVENT	STEAM	SMR Steam Vent	14.81	0.68	20.16
Net Annual Change			14.81	0.68	20.16
Total of annual Increases			14.81	0.68	20.16
Total of annual decreases			-	-	-
Annual Dec : Inc Ratio			-	-	-

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*

Modeling Information

NSR Permit No. 27773 Amendment Application

Air Products LLC

December 2020

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

General

Date: December 2020
Permit #: 27773

Company Name: Air Products LLC

EMEW Version No.: Version 2.3

Purpose Statement:
This workbook is completed by the applicant and submitted to the Texas Commission on Environmental Quality (TCEQ), specifically, the Air Dispersion Modeling Team (ADMT) for review. This workbook is a tool available for all projects using AERSCREEN, AERMOD, or ISC/ISCPrime for an impacts review and its use is required starting June 1, 2019. Provide the workbook with the permit application submittal for any Minor New Source Review project requiring a modeling impacts demonstration.

This workbook follows the guidance outlined in the Air Quality Modeling Guidelines (APDG 6232) which can be found here:

https://www.tceq.texas.gov/assets/public/permitting/air/Modeling/guidance/airquality-mod-guidelines6232.pdf

Workbook Instructions:
1. Save a copy of the workbook to your computer or desktop prior to entering data.
2. Complete all required sections leaving no blanks. You may use the "tab" button or the arrow keys to move to the next available cell. Use "enter" to move down a line. Note: drop-downs are case-sensitive.
3. Fill in the workbook in order, do not skip around as this will cause errors. Use caution if changing a previously entered entry.
4. Not applicable sections of this workbook will be hidden as data is entered. For example, answering "No" to "Is downwash applicable? " will hide these sections of the workbook required only for downwash entry.
5. Email the workbook electronic file (EMEW) and any attachments to the Air Permits Initial Review Team. The subject line should read "Company Name - Permit Number (if known) - NSR Permit Application". Email address:
apirt@tceq.texas.gov
6. If printing the EMEW, follow the directions below to create a workbook header.
7. Printing the EMEW is not required for submitting to the Air Permits Division (APD); however, you may need to print it for sending to the regional offices, local programs, and for public access if notice is required. To print the workbook, follow the instructions below. Please be aware, several sheets contain large amounts of data and caution should be taken if printing, such as the Speciated Emissions sheet.
8. Updates may be necessary throughout the review process. Updated workbooks must be submitted in electronic format to APD. For submittal to regional offices, local programs, or public places you only have to print sheets that had updates. Be sure to change the headers accordingly.

Note: Since this will be part of the permit application, follow the instructions in the Form PI-1 General Application on where to send copies of your EMEW and permit application. The Form PI-1 General Application can be found here:
https://www.tceq.texas.gov/permitting/air/guidance/newsourcereview/nsrapp-tools.html

Create Headers Before Printing:
1. Right-click one of the workbook's sheet tabs and "Select All Sheets."
2. Enter the "Page Layout View" by using the navigation ribbon's View > Workbook Views > Page Layout, or by clicking the page layout icon in the lower-right corner of Excel.
3. Add the date, company name, and permit number (if known) to the upper-right header. Note that this may take up to a minute to update your spreadsheet. Select any tab to continue working on the spreadsheet.

Printing Tips:
While APD does not need a hard copy of the full workbook, you may need to print it for sending to the regional offices, local programs, and for public access if notice is required.
1. The default printing setup for each sheet in the workbook is set for the TCEQ preferred format. The print areas are set up to not include the instructions on each sheet.
2. You have access to change all printing settings to fit your needs and printed font size. Some common options include:
   -Change what area you are printing (whole active sheet or a selection);
   -Change the orientation (portrait or landscape);
   -Change the margin size; and
   -Change the scaling (all columns on one sheet, full size, your own custom selection, etc.).

Final Modeling Submittal:
Anytime final modeling files are being submitted the applicant should notify the following that modeling files are being sent: permit reviewer assigned, permit reviewer's supervisor, and the modeler assigned from the initial submittal.
The following options are available for an applicant to provide modeling (or any other files):
1. Applicant can mail or hand deliver the files on an external storage device.
2. Applicant can email files smaller than 25mb.
3. Applicant can transfer files through an FTP site:
   a. Applicant may have their own FTP site and can share the files with TCEQ staff.
   b. Applicants can use the TCEQ FTP site.

Instructions for setting up an account on the TCEQ FTP site are located at:
https://ftps.tceq.texas.gov/help/

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

General

Date: December 2020
Permit #: 27773

Company Name: Air Products LLC

Acknowledgement:	Select from the drop down:
I acknowledge that I am submitting an authorized TCEQ Electronic Modeling Evaluation Workbook and any necessary attachments. Except for inputting the requested data, I have not changed the TCEQ Electronic Modeling Evaluation Workbook in any way, including but not limited to changing formulas, formatting, content, or protections.	I agree

Administrative Information:	
Data Type:	**Facility Information:**
Project Number (6 digits):	
Permit Number:	27773
Regulated Entity ID (9 digits):	100221324
Facility Name:	Steam Methane Reformer Unit (SMR Unit)
Facility Address:	1423 Pasadena Fwy
Facility County (select one):	Harris
Company Name:	Air Products LLC
Company Contact Name:	Tammy Grover
Company Contact Number:	281-478-3172
Company Contact Email:	grovertb@airproducts.com
Modeling Company Name, as applicable:	AECOM
Modeling Contact Name:	Rawan El-Afifi
Modeling Contact Number:	(281) 647-4435
Modeling Contact Email:	rawan.elafifi@aecom.com
New/Existing Site (select one):	Existing Site
Modeling Date (MM/DD/YYYY):	12/4/2020
Datum Used (select one):	NAD 83
UTM Zone (select one):	15

Sheet Instructions: Indicate in the Table of Contents which sections are applicable and included for this modeling demonstration. Select "X" from the drop down if the item below is included in the workbook. Note: This workbook is only for the following air dispersion models: AERSCREEN, ISC/ISCPrime, and/or AERMOD. If SCREEN3 is used, please use the separate Electronic Modeling Evaluation Workbook (EMEW) for SCREEN3 workbook.

Table of Contents:

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

General

Date: December 2020
Permit #: 27773

Company Name: Air Products LLC

Included Attachments Instructions: The following are attachments that must be included with any modeling analysis. If providing the plot plan and area map with the permit application, ensure there is also a copy with the EMEW. The copy can be electronic.	**Select an X from the dropdown menu if included:**
Plot Plan: Instructions: Mark all that apply in the attached plot plan. For larger properties or dense source areas, provide multiple zoomed in plot plans that are legible.	
Property/Fence Lines all visible and marked.	X
North arrow included.	X
Clearly marked scale.	X
All sources and buildings are clearly labeled.	Choose an item
Area Map:	
Instructions: Mark all that apply in the attached area map.	
Annotate schools within 3,000ft of source's nearest property line.	X
All property lines are included.	X
Non-industrial receptors are identified.	Choose an item
Additional Attachments (as applicable): *Note: These are just a few examples of attachments that may need to be included. There may be others depending on the scope of the modeling analysis.*	**Select an X from the dropdown menu if included:**
Processed Met Data Information	
Excel spreadsheet of processed meteorology data.	Choose an item
Meteorological Files (all input and outputs).	Choose an item
Source Group Descriptions	
Description of modeling source groups (could be in a tabulated format).	Choose an item
Modeling Techniques and Scenarios *Provide all justification and discussion on modeling scenarios used for the modeling analyses. The following boxes are examples of approaches that should be provided but is not all inclusive.*	
Discussion on modeling techniques not discussed in workbook.	Choose an item
Justification for exceedance refinements, as applicable.	Choose an item
Discussion and images for worst-case determination, as applicable.	Choose an item
Single Property Line Designation, as applicable	
Include Agreement, Order, and map defining each petitioner.	Choose an item
Post Processing using Unit Impact Multipliers (UIMs)	
Include documentation on any calculations used with the UIMs (i.e., Step 3 of the MERA).	X
Tier 3 NO_2 analysis *If OLM or PVMRM are used, provide all justification and documentation on using this approach.*	
Description of model setup.	Choose an item
Description and justification of model options selected (i.e., NO_2 to NO_x in-stack ratios).	Choose an item
Other Attachments *Provide a list in the box below of additional attachments being provided that are not listed above:*	
A supplemental information PDF is being submitted that contains a plot plan, area map, and attachments associated with the modeling analysis which include: B-1 MERA Table, B-2 Emission Rates, B-3 Stack Parameters, B-4 Screening Analysis, B-5 Sitewide Emission Rates, B-6 Ratio Test	X

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Model Options

Date: December 2020
Permit #: 27773

Company Name: Air Products LLC

I. Project Information

A. Project Overview: In the box below, give a brief Project Overview. To type or insert text in box, double click in the box below. *Please limit your response to 2000 characters.*

Air Products LLC (Air Products) is submitting a permit amendment application for their Steam Methane Reformer Unit (SMR Unit) located in Pasadena, Texas. The SMR Unit is authorized via NSR Permit No. 27773. A health effects analysis is required as part of the analyis and the impacts associated with all emission increases of health effects pollutants (short-term and long-term ammonia and methanol) were evaluated. All impacts were below their respective thresholds (i.e., less than 10% of the ESL) except for 1-hour ammonia. A ratio test (Step 6 of the MERA analysis) was conducted for 1-hour ammonia, and it was found to meet the requirements. Therefore, the MERA analysis is complete.

II. Air Dispersion Modeling Preliminary Information

Instructions: Fill in the information below based on your modeling setup. The selections chosen in this sheet will carry throughout the sheet and workbook. Based on selections below, only portions of the sheet and workbook will be available. Therefore, it is vital the sheet and workbook are filled out in order, do NOT skip around.

For larger text boxes, double click to type or insert text.

A. Type of Model Used: *Select "X" in all that apply*

	AERSCREEN	X	AERMOD

Enter in all applicable Model Version(s).

B. Building Downwash

Yes	Is downwash applicable? *(Select "Yes" or "No")*
04274	Enter BPIP version (AERMOD and ISCPrime only).

C. Type of Analyses: (Select "X" in all that apply)
*PSD projects should submit a protocol and not utilize this form.

	Minor NSR NAAQS		State Property Line
X	Health Effects		

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Model Options

Date: December 2020
Permit #: 27773

Company Name: Air Products LLC

D. Constituents Evaluating: (Select "X" in all that apply)

Health Effects: Fill in the Speciated Emissions sheet with all applicable pollutants, CAS numbers, and ESLs.

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Model Options

Date: December 2020
Permit #: 27773

Company Name: Air Products LLC

E. Dispersion Options: *If "Urban" has been selected and this project is using AERMOD or AERSCREEN, include the population used. Select "X" in the box to select an option.*

	Urban
X	Rural

Provide any additional justification on the dispersion option selected above:

The rural dispersion option is the most conservative option

F. Determination of Surface Roughness: *If AERSCREEN or AERMOD is used, fill out the section below.*

Select basis for surface roughness: AERSURFACE

Select "X" in one of the three surface roughness categories:

	Low	X	Medium
			High

If you are using AERSURFACE, please complete the following section:

20060	AERSURFACE Version Number		
287687	Center UTM Easting (meters)	3288988	Center UTM Northing (meters)
1	Study Radius (km)		
No	Airport? (Select Yes or No)		
No	Continuous Snow Cover (Select Yes or No)		
Average	Surface Moisture (Select Wet, Dry, or Average)		
No	Arid Region? (Select Yes or No)		
Default	Month/Season Assignment		

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Model Options

Date: December 2020
Permit #: 27773

Company Name: Air Products LLC

G. Meteorological Data:			
If AERMOD and/or ISC/ISCPrime are selected, please complete the following section:			
12918		Surface Station	
3937		Upper Air Station	
14.3	Meters (m)	Profile Base Elevation (AERMOD only)	
19191		AERMET Version Number	
Yes	Was TCEQ pre-processed data used?	1 Year	Years used
Please enter the year(s) selected for this meteorological data:			
2016	1 Year		
Provide any other justification for Meteorological Data, as applicable.			

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Model Options

Date: December 2020
Permit #: 27773

Company Name: Air Products LLC

H. Receptor Grid:		
For AERMOD or ISC/ISCPrime, fill in the following information on your modeled receptor grid. Note: Receptor grid resolution (tight, fine, medium, coarse) are based on recommended receptor grid spacing per the AQMG, if something outside of this is used, fully describe it below.		
25	Meters (m)	Tight Receptor Spacing
300	Meters (m)	Tight Receptor Distance
100	Meters (m)	Fine Receptor Spacing
1000	Meters (m)	Fine Receptor Distance
500	Meters (m)	Medium Receptor Spacing
5000	Meters (m)	Medium Receptor Distance
1000	Meters (m)	Coarse Receptor Spacing
10000	Meters (m)	Coarse Receptor Distance
Describe any other receptor grid designs (over water, GLC_{ni}, SPLD etc.):		

I. Terrain:	
X	Elevated
18081	AERMAP Version.
For additional justification on terrain selection, fill in the box below:	

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Building Downwash

Date: December 2020
Permit #: 27773

Company Name: Air Products LLC

Facility:

Downwash Type	Modeled Building ID	Tank Diameter (m)	Number of Tiers	Maximum Height (m)	Tier 1 Height (m)	Tier 2 Height (m)	Tier 3 Height (m)	Tier 4 Height (m)	Tier 5 Height (m)	Tier 6 Height (m)	Tier 7 Height (m)	Tier 8 Height (m)	Tier 9 Height (m)	Tier 10 Height (m)
Building	BLDG13		1	7.9248	7.9248									
Building	BLDG14		1	8.5344	8.5344									
Building	BLDG15		1	4.2672	4.2672									
Building	BLDG24		1	3.6576	3.6576									
Building	UTILIT		1	3.6576	3.6576									
Building	BLDG32		1	3.6576	3.6576									
Building	BLDG33		1	3.9624	3.9624									
Building	BLDG34		1	4.572	4.572									
Building	BLDG35		1	3.6576	3.6576									
Building	BLDG36		1	5.4864	5.4864									
Building	BLDG37		1	3.6576	3.6576									
Building	BLDG38		1	3.6576	3.6576									
Building	BLDG39		1	4.8768	4.8768									
Building	BLDG40		1	4.572	4.572									
Building	BLDG41		1	6.096	6.096									
Building	BLDG45		1	25.908	25.908									
Building	BLDG46		1	9.144	9.144									
Building	BLDG47		1	4.572	4.572									
Building	BLDG48		1	18.288	18.288									
Building	BLDG49		1	6.096	6.096									
Building	BLDG51		1	3.6576	3.6576									
Building	BLDG52		1	3.6576	3.6576									
Building	BLDG53		1	3.6576	3.6576									
Building	BLDG54		1	7.62	7.62									
Building	BLDG55		1	3.6576	3.6576									
Building	BLDG56		1	3.6576	3.6576									
Building	SAC_CT		1	7.62	7.62									
Building	CONTROL		1	6.096	6.096									
Building	WareHous		1	9.144	9.144									
Building	Mainten		1	9.144	9.144									
Building	MCC25		1	3.048	3.048									
Building	IOROOM		1	3.6576	3.6576									
Building	MCC18		1	3.6576	3.6576									
Building	HOTBOX		1	3.6576	3.6576									
Building	HONEYWEL		1	6.096	6.096									
Building	MCC		1	6.096	6.096									
Building	BDG		1	3.6576	3.6576									
Building	MCC1720		1	3.6576	3.6576									
Building	MCC56		1	6.096	6.096									

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Building Downwash

Date: December 2020
Permit #: 27773

Company Name: Air Products LLC

Downwash Type	Modeled Building ID	Tank Diameter (m)	Number of Tiers	Maximum Height (m)	Tier 1 Height (m)	Tier 2 Height (m)	Tier 3 Height (m)	Tier 4 Height (m)	Tier 5 Height (m)	Tier 6 Height (m)	Tier 7 Height (m)	Tier 8 Height (m)	Tier 9 Height (m)	Tier 10 Height (m)
Building	MCC15		1	3.6576	3.6576									
Building	NH1W260		1	2.4384	2.4384									
Building	MCC27		1	3.6576	3.6576									
Building	SSF		1	2.7432	2.7432									
Building	BLDG50B		1	25.6032	25.6032									
Building	T440		1	9.7536	9.7536									
Building	V16_118		1	9.144	9.144									
Building	Tk4		1	18.288	18.288									
Building	Tk5		1	18.288	18.288									
Building	Tk6		1	6.096	6.096									
Building	MTK_1		1	15.24	15.24									
Building	MTK_2		1	15.24	15.24									
Building	MTK_3		1	15.24	15.24									
Building	MTK_4		1	15.24	15.24									
Building	MTK_5		1	15.24	15.24									
Building	MTK_6		1	15.24	15.24									
Building	MTK_7		1	15.24	15.24									
Building	MTK_8		1	15.24	15.24									
Building	MTK_9		1	15.24	15.24									
Building	MTK_10		1	15.24	15.24									
Building	MTK_11		1	15.24	15.24									
Building	MTK_12		1	12.192	12.192									
Building	MTK_13		1	6.096	6.096									
Building	MTK_14		1	9.144	9.144									
Building	MTK_15		1	9.144	9.144									
Building	MTK_16		1	6.096	6.096									
Building	MTK_17		1	6.096	6.096									
Building	MTK_18		1	6.096	6.096									
Building	MTK_19		1	6.096	6.096									
Building	MTK_20		1	6.096	6.096									
Building	MTK_21		1	6.096	6.096									
Building	MTK_22		1	6.096	6.096									
Building	MTK_23		1	6.096	6.096									
Building	MTK_24		1	9.144	9.144									
Building	MTK_25		1	7.3152	7.3152									
Building	MTK_26		1	7.3152	7.3152									
Building	MTK_27		1	9.144	9.144									
Building	TK150		1	7.9248	7.9248									
Building	TK450		1	9.6012	9.6012									
Building	TK210		1	4.572	4.572									
Building	Tk16.09		1	9.144	9.144									
Building	Tk16.23A		1	7.62	7.62									
Building	Tk16.14A		1	9.144	9.144									
Building	HY1T350		1	9.144	9.144									
Building	HY1-T190		1	6.096	6.096									

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Building Downwash

Date: December 2020
Permit #: 27773

Company Name: Air Products LLC

Downwash Type	Modeled Building ID	Tank Diameter (m)	Number of Tiers	Maximum Height (m)	Tier 1 Height (m)	Tier 2 Height (m)	Tier 3 Height (m)	Tier 4 Height (m)	Tier 5 Height (m)	Tier 6 Height (m)	Tier 7 Height (m)	Tier 8 Height (m)	Tier 9 Height (m)	Tier 10 Height (m)
Building	TK_CARB		1	10.668	10.668									
Building	KOPOT		1	13.716	13.716									
Building	HY1_610		1	6.096	6.096									
Building	HY1_620		1	6.096	6.096									
Building	HY1_630		1	6.096	6.096									
Building	HY1_640		1	6.096	6.096									
Building	HY1_600		1	6.096	6.096									
Building	KOPOT2		1	13.716	13.716									
Building	BYPROCT		1	13.716	13.716									
Building	DEMIN		1	9.144	9.144									
Building	V16.20		1	6.096	6.096									
Building	V16.22A		1	6.096	6.096									
Building	TK180		1	6.096	6.096									
Building	TK170		1	8.5344	8.5344									
Building	BLDG50		2	29.2608	25.6032	29.2608								

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Point Source Parameters

Date: December 2020
Permit #: 27773

Company Name: Air Products LLC

Facility:

EPN	Model ID	Modeling Scenario	Source Description	Point Source Type	Point Source Justification	Easting: X [m]	Northing: Y [m]	Base Elevation [m]	Height [m]	Exit Temperature [K]	Exit Velocity [m/s]	Diameter [m]
SMR-SVENT	SMRVENT	ROUTINE	SMR Steam Vent	POINTHOR	Vertical stack with horizontal release	287672.00	3289345.00	8.00	23.77	527.594	16.764	3.048

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Point + Flare Emissions

Date: December 2020
Permit #: 27773

Company Name: Air Products LLC

Facility:

EPN	Model ID	Modeling Scenario	Pollutant	Modeled Averaging Time	Standard Type	Review Context	Intermittent Source?	Modeled Emission Rate [lb/hr]	Basis of Emission Rate	Scalars or Factors Used?	Scalar/Factor in Use
SMR-SVENT	SMRVENT	ROUTINE	Generic	1-hr			No	1.00	generic modeling at 1 lb/hr. See Appendix B-2 of the supplemental information for pollutant-specific emission rates.	No	
SMR-SVENT	SMRVENT	ROUTINE	Generic	Annual			No	1.00	generic modeling at 1 lb/hr. See Appendix B-2 of the supplemental information for pollutant-specific emission rates.	No	
SMR-SVENT	SMRVENT	ROUTINE	Health Effects Pollutant	1-hr	Health Effects	Project Wide	No		Generic modeling of 1 lb/hr used, but health effects selected in order to populate emission rate in "Speciated Emissions" tab.	No	
SMR-SVENT	SMRVENT	ROUTINE	Health Effects Pollutant	Annual	Health Effects	Project Wide	No		Generic modeling of 1 lb/hr used, but health effects selected in order to populate emission rate in "Speciated Emissions" tab.	No	

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Speciated Emissions

Date: December 2020
Permit #: 27773

Company Name: Air Products LLC

Speciated Emissions by Model ID

CAS #	Chemical Species	Other Species	Short-Term ESL (µg/m³)	Long-Term ESL (µg/m³)	Modeled Project Wide Emission Rate [lb/hr]	Modeled Site Wide Emission Rate [lb/hr]	Modeled Project Wide Emission Rate [tpy]	Modeled Site Wide Emission Rate [tpy]
					SMRVENT	SMRVENT	SMRVENT	SMRVENT
7664-41-7	ammonia		180	92	5.93		14.81	
67-56-1	methanol		3900	2100	1.78		20.16	

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Combined Emissions

Date: December 2020
Permit #: 27773

Company Name: Air Products LLC

EPN	Model ID	Modeling Scenario	Pollutant	Modeled Averaging Time	Standard Type	Review Context	Intermittent	Source Type	Modeled Emission Rate [lb/hr]
SMR-SVENT	SMRVENT	ROUTINE	Generic	1-hr			No	Point	1.00
SMR-SVENT	SMRVENT	ROUTINE	Generic	Annual			No	Point	1.00
SMR-SVENT	SMRVENT	ROUTINE	Health Effects Pollutant	1-hr	Health Effects	Project Wide	No	Point	--
SMR-SVENT	SMRVENT	ROUTINE	Health Effects Pollutant	Annual	Health Effects	Project Wide	No	Point	--

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Modeling Scenarios

Date: December 2020
Permit #: 27773

Company Name: Air Products LLC

Modeling Scenario	Scenario Description:
ROUTINE	Routine emissions occuring continuously throughout the year

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Unit Impact Multipliers

Date: December 2020
Permit #: 27773

Company Name: Air Products LLC

Facility:

EPN	Model ID	Modeling Scenario	Averaging Time	GLCmax ($\mu g/m^3$ per lb/hr)	GLCmax ($\mu g/m^3$ per tpy)
SMR-SVENT	SMRVENT	ROUTINE	1-hr	6.49	
SMR-SVENT	SMRVENT	ROUTINE	Annual	0.0359	

Texas Commission on Environmental Quality
Electronic Modeling Evaluation Workbook (EMEW)
Health Effect Modeling Results

Date: December 2020
Permit #: 27773

Company Name: Air Products LLC

Facility:

Modeled Health Effect Results (MERA Guidance):				Step 3	Step 4: Production		Step 4: MSS		Step 5: MSS Only	Step 5: Hours of Exceedance				Step 6	Step 7: Site Wide				Step 7: Hours of Exceedance			
Chemical Species	CAS Number	Averaging Time	ESL [$\mu g/m^3$]	10% ESL Step 3 Modeled GLCmax [$\mu g/m^3$]	25 % ESL Step 4 Production GLCmax since most recent site wide modeling [$\mu g/m^3$]	10% ESL Step 4 Production Project Only GLCmax [$\mu g/m^3$]	50% ESL Step 4 MSS GLCmax since most recent site wide modeling [$\mu g/m^3$]	25% ESL Step 4 MSS Project Only GLCmax [$\mu g/m^3$]	Full ESL Step 5 GLCmax [$\mu g/m^3$]	*1X ESL GLCmax* Step 5 MSS Hours of Exceedance	*2X ESL GLCmax* Step 5 MSS Hours of Exceedance	*4X ESL GLCmax* Step 5 MSS Hours of Exceedance	*10X ESL GLCmax* Step 5 MSS Hours of Exceedance	Was Step 6 relied on to fail out of the MERA?	Site Wide GLCmax [$\mu g/m^3$]	Site Wide GLCni [$\mu g/m^3$]	GLCni Location Easting: X [m]	GLCni Location Northing: Y [m]	*1X ESL GLCni* Hours of Exceedance	*2X ESL GLCmax* Hours of Exceedance	*4X ESL GLCmax* Hours of Exceedance	*10X ESL GLCmax* Hours of Exceedance
ammonia	7664-41-7	1-hr	180	38.48										Yes (Verify with Permit Reviewer)								
ammonia	7664-41-7	Annual	92	0.12																		
methanol	67-56-1	1-hr	3900	11.56																		
methanol	67-56-1	Annual	2100	0.17																		

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Modeling File Names

Date: December 2020
Permit #: 27773

Company Name: Air Products LLC

Facility:

Model File Base Name	Pollutant	Averaging Time	File Extensions	Additional File Description
AP_Pasadena_27773_SMR_2016_UNIT	generic	All	*.bnd, *.dta, *.grf, *.lst, *.sum	generic unit impact modeling
APPas	all	all	*.inp, *.log,*.out, *_can_grid.txt, *_imp_grid.txy,*_lc_grid.txt,*_scf.txt	AERSURFACE
AP_Pasadena_27773_SMR_PRIME	all	all	*.pip, *.prw, *.so, *.sum, *.tab	BPIP-PRIME
HARRIS_HOULCH16M	all	all	*.pfl, *.sfc	Met Data
AP Pasadena 27773 Supplemental Information	all	all	*.pdf	Supplemental information containing plot plan, area map, mera table, modeled emission rates, modeled stack parameters, sitewide emission rates, and ratio test for 1-hr ammonia

Air Products LLC
Pasadena, Texas
Permit No. 27773 Modeling
Supplemental Information

Appendix A:

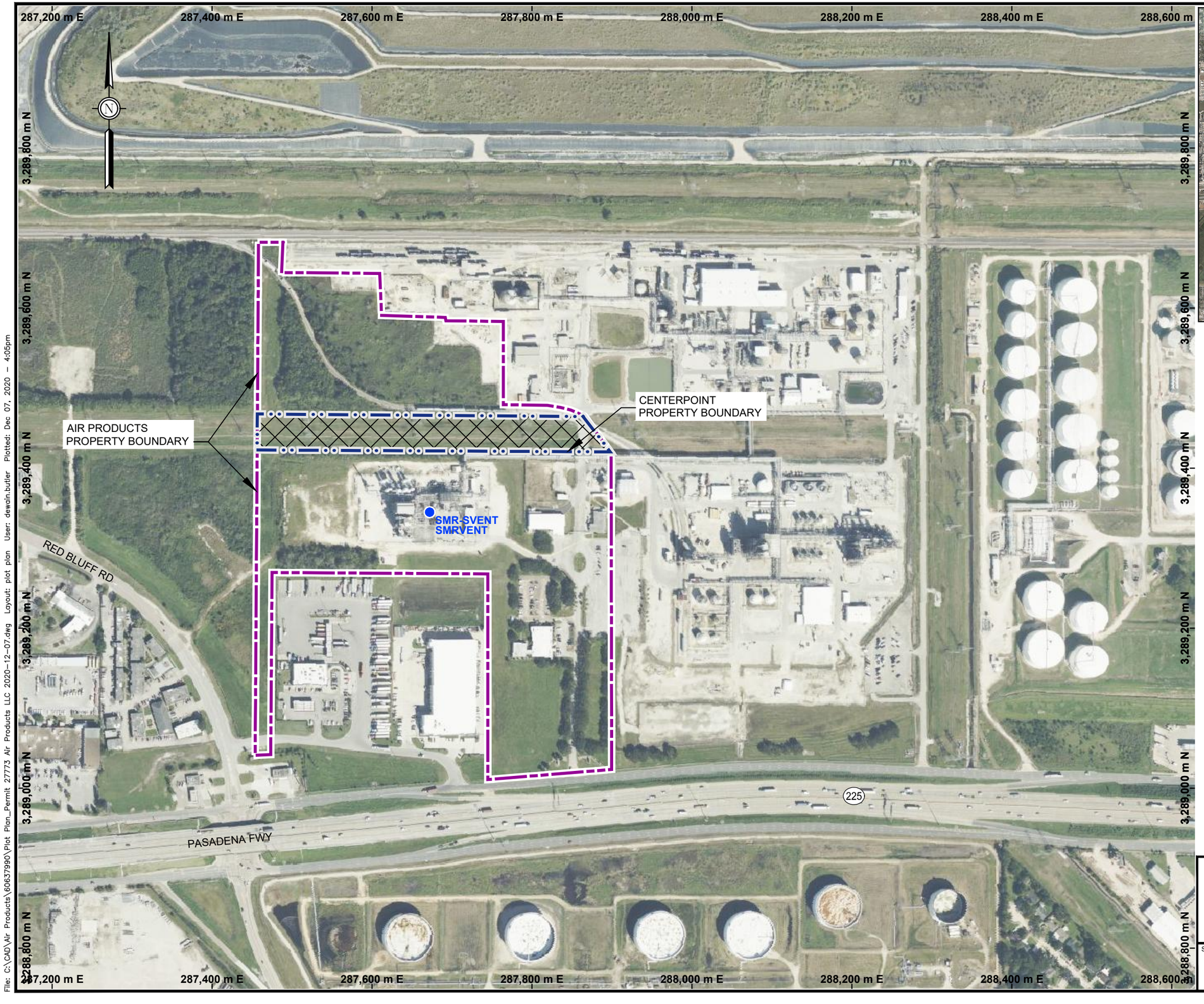
- Plot Plan (Project-level)
- Area Map

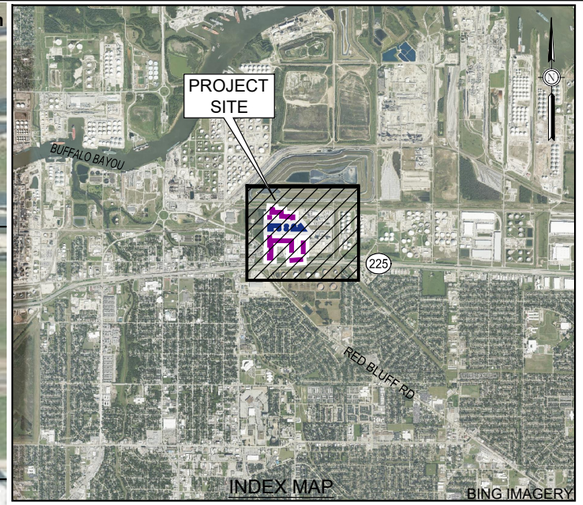
Appendix B:

- Appendix B-1. Modeling and Effects Review Applicability Table
- Appendix B-2. Modeled Emission Increases - Project Level
- Appendix B-3. Modeled Stack Parameters – Project Level
- Appendix B-4. Screening Analysis
- Appendix B-5. Sitewide Emission Rates
- Appendix B-6. Ratio Test

Appendix A:

- Plot Plan (Project-level)
- Area Map





LEGEND:

- AIR PRODUCTS PROPERTY BOUNDARY
- CENTERPOINT PROPERTY BOUNDARY
- EPN ID. — SMR-SVENT / MODEL ID. — SMRVENT — POINT SOURCE

POINT SOURCE

EPN	Model ID	Description	UTM-X (m)	UTM-Y (m)
SMR-SVENT	SMRVENT	SMR Steam Vent	287672	3289345

60 0 60 120 60

APPROXIMATE SCALE IN METERS

NOTES:
1. COORDINATE SYSTEM IS UTM WITH NAD83 DATUM, ZONE 15, METERS; CENTRAL MERIDIAN.
2. 200 METER GRID BASED ON UTM ZONE 15, NAD 83.
3. AERIAL IMAGES PROVIDED BY BING IMAGERY SERVICES.

AECOM
19219 KATY FREEWAY, SUITE 100
HOUSTON, TEXAS 77094
PH: (281) 646-2400
FAX: (281) 646-2401

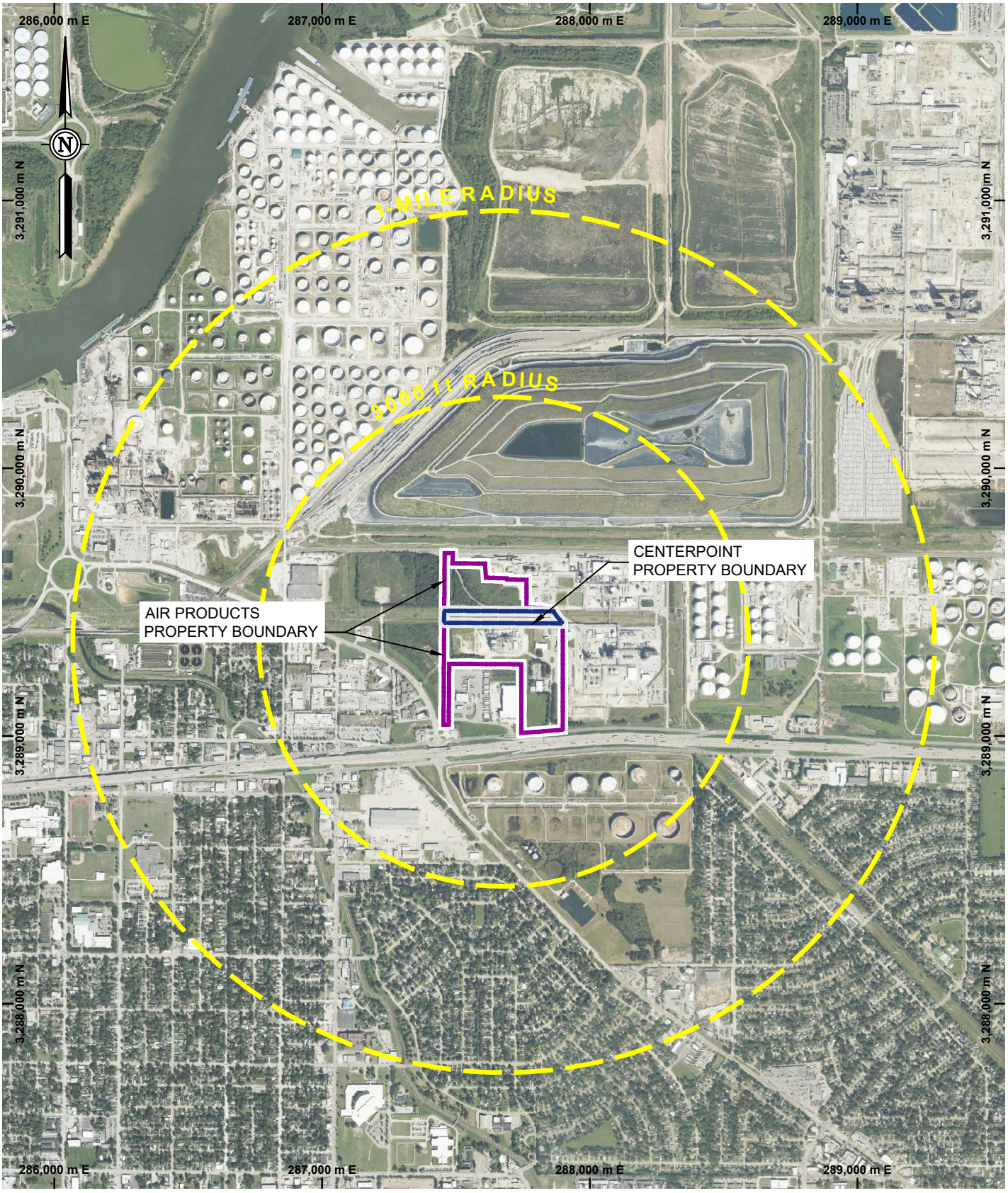
Title: **PLOT PLAN**

Project:
PERMIT No. 27773
PASADENA FACILITY
1423 HIGHWAY 225
PASADENA, HARRIS COUNTY, TEXAS 77501

Client: **AIR PRODUCTS LLC**

Scale:	Drawn by:	Date:	Project No.:	File Name:	Figure:
AS NOTED	DB	12/07/20	60637990	PLOT PLAN_PERMIT 27773 AIR PRODUCTS LLC 2020-12-07.DWG	-
	Chk'd by: RE	Date: 11/07/20			

File: C:\CAD\Air Products\60637990\Plot Plan_Permit 27773 Air Products LLC 2020-12-07.dwg Layout: plot plan User: dewain.butler Plotted: Dec 07, 2020 – 4:05pm



0 200 400 600 800 m

SCALE IN METERS
(1 cm = 200 m)

NOTES:

1.COORDINATE SYSTEM BASED ON UTM WITH NAD83 DATUM, ZONE 15, METERS; CENTRAL MERIDIAN.
2.AERIAL IMAGERY: BING IMAGERY SERVICES.

AECOM
10550 RICHMOND AVENUE, SUITE 155
HOUSTON, TEXAS 77042
PH: (713) 914-6699
FAX: (713) 789-8404

Title: **AREA MAP**

Project:
PASADENA FACILITY
1423 HIGHWAY 225
PASADENA, HARRIS COUNTY, TEXAS 77501

Client: **AIR PRODUCTS LLC**

Scale:	Drawn by:	Date:	Project No.:	File Name:	Figure:
AS NOTED	DB	12/07/20	60637990	Area And Source - AirProduct Pasadena - UTM83-15 -2020-12-08.dwg	-
	Chk'd by: RE	Date: 12/07/20			

File: C:\CAD\Air Products\60637990\Area and Source - AirProduct Pasadena - UTM83-15 -2020-12-08.dwg Layout: Area Map User: dewain.butler Plotted: Dec 07, 2020 - 5:11pm

Appendix B:

- Appendix B-1. Modeling and Effects Review Applicability Table
- Appendix B-2. Modeled Emission Increases - Project Level
- Appendix B-3. Modeled Stack Parameters – Project Level
- Appendix B-4. Screening Analysis
- Appendix B-5. Sitewide Emission Rates
- Appendix B-6. Ratio Test

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B-1. Modeling and Effects Review Applicability Table

TCEQ Impact Review Considerations

CAS#	7664-41-7	64-17-5	67-56-1
Air Contaminant	**Ammonia**	**Ethanol**	**Methanol**
Short-Term (ST) ESL (ug/m3)	180	18800	3900
Long Term (LT) ESL (ug/m3)	92	1880	2100
Is LT-ESL >= 10% of ST-ESL? If "No", Include Long Term Emissions in analysis.	Yes	Yes	Yes
Net Hourly Change	5.93	0.20	1.78
Total of Hourly Increases	5.93	0.20	1.78
Total of Hourly Decreases	-	-	-
Net Annual Change	14.81	0.68	20.16
Total of Annual Increases	14.81	0.68	20.16
Total of Annual Decreases	-	-	-

TCEQ Modeling and Effects Applicability

Flow Chart	MERA Flowchart Requirement	Ammonia	Ethanol	Methanol
Flow Chart Step 1	Is the net change in emissions less than or equal to zero?	Continue	Continue	Continue
Flow Chart Step 2	Is the long-term ESL≥10% of the short-term ESL?	Yes	Yes	Yes
Flow Chart Step 2(1)	Routine increases <= 0.04 lb/hr and MSS Emissions Increase <=0.1, and the ESL is >=2 ESL < 500	Continue	Continue	Continue
Flow Chart Step 2(2)	Routine increases <= 0.1 lb/hr and MSS Emissions Increase <=0.1, and the ESL is >=500 ESL < 3500	Continue	Continue	Continue
Flow Chart Step 2(3)	Routine increases <= 0.4 lb/hr OR MSS Emissions Increase <=0.4, and the ESL is >=3500	Continue	Modeling Not Required	Continue
Flow Chart Step 3	**Is GLCmax concentration due to emission increase <10% ESL?**	Model		Model

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B-2. Modeled Emission Increases - Project Level

EPN	Model ID	Description	Ammonia (lb/hr)	Ammonia (tpy)	Methanol (lb/hr)	Methanol (tpy)
SMR-SVENT	SMRVENT	SMR Steam Vent	5.93	14.81	1.78	20.16

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B-3. Modeled Stack Parameters – Project Level

EPN	Model ID	Description	UTM-X (m)	UTM-Y (m)	Release Height (ft)	Temp (F)	Vel (fps)	Dia (ft)
SMR-SVENT	SMRVENT	SMR Steam Vent	287672	3289345	78	490.00	55.00	10.00

[1] EPN SMR-SVENT emits horizontally, and so the horizontal stack release type was selected in AERMOD.

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B-4. Screening Analysis

Attached is screening analysis for emission standards.

Emission Source Parameters

The following lists stack parameters for the facility:

Point

EPN	Model ID	Name	UTM-X (m)	UTM-Y (m)	Height (ft)	Temp (F)	Exit Velocity (fps)	Stack Dia (ft)
SMR-SVENT	SMRVENT	SMR Steam Vent	287672	3289345	78	490.00	55.00	10.00

[1] EPN SMR-SVENT emits horizontally, and so the horizontal stack release type was selected in AERMOD.

Individual Modeling Results

The following model results represent dilution factors determined for each source:

EPN	Model ID	Description	1-hr UIM	Annual UIM
SMR-SVENT	SMRVENT	SMR Steam Vent	6.49	0.04

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B-4. Screening Analysis
Screen Model per Compound

Screening Analysis for Ammonia Emissions

EPN	Model ID	Description	Maximum Hourly Increased Emission Rate [1] (lb/hr)	1-Hour AERMOD Generic Unit Model @ 1 lb/hr [2] ($\mu g/m^3$)	Predicted 1-hr Maximum [3] ($\mu g/m^3$)	Annual Average Emission Rate [1] (tpy)	Annual AERMOD Generic Unit Model @ 1 lb/hr [2] ($\mu g/m^3$)	Predicted Annual Maximum [4] ($\mu g/m^3$)
SMR-SVENT	SMRVENT	SMR Steam Vent	5.93	6.49	38.48	14.81	0.04	0.12
				GLCmax (ug/m^3)[5]	38.48		**GLCmax (ug/m^3)[5]**	0.12
				ESL (ug/m^3)	180		**ESL (ug/m^3)**	92
				GLCmax < 10% ESL?	No		**GLCmax < 10% ESL?**	Yes
					21%			

Footnotes
1. Emissions increased rate.
2. Generic Unit model results. Model uses 1 pound per hour (lb/hr) emission rate and AERMOD Model and Default Met Data.
3. 1-Hr Conc. = Modeled Rate (lb/hr) x 1-hr AERMOD Generic Unit Model.
4. Annual Conc. = Modeled Rate (tpy) / (8760 hour/year) x (2000 lb/ton) x Annual AERMOD Generic Unit Model
5. Maximum, ground-level concentration predicted by screening model.

Screening Analysis for Methanol Emissions

EPN	Model ID	Description	Maximum Hourly Increased Emission Rate [1] (lb/hr)	1-Hour AERMOD Generic Unit Model @ 1 lb/hr [2] ($\mu g/m^3$)	Predicted 1-hr Maximum [3] ($\mu g/m^3$)	Annual Average Emission Rate [1] (tpy)	Annual AERMOD Generic Unit Model @ 1 lb/hr [2] ($\mu g/m^3$)	Predicted Annual Maximum [4] ($\mu g/m^3$)
SMR-SVENT	SMRVENT	SMR Steam Vent	1.78	6.49	11.56	20.16	0.04	0.17
				GLCmax (ug/m^3)[5]	11.56		**GLCmax (ug/m^3)[5]**	0.17
				ESL (ug/m^3)	3900		**ESL (ug/m^3)**	2100
				GLCmax < 10% ESL?	Yes		**GLCmax < 10% ESL?**	Yes

Footnotes
1. Emissions increased rate.
2. Generic Unit model results. Model uses 1 pound per hour (lb/hr) emission rate and AERMOD Model and Default Met Data.
3. 1-Hr Conc. = Modeled Rate (lb/hr) x 1-hr AERMOD Generic Unit Model.
4. Annual Conc. = Modeled Rate (tpy) / (8760 hour/year) x (2000 lb/ton) x Annual AERMOD Generic Unit Model
5. Maximum, ground-level concentration predicted by screening model.

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B-5. Sitewide Emission Rates

EPN	Model ID	Description	Ammonia Emission Rate (lb/hr)
SMR-SVENT	SMRVENT	SMR Steam Vent	7.32
SMR-1	SMR_1	Reformer Furnace Stack	10.4
SMR-3	SMR_3	Fugitives	0.03
INS-B	INSB	Aqueous Ammonia Pump Maintenance and Repair	0.02
INS-A	INSA	Inherently Low Emitting Maintenance Activities (Fuel Vent, Maintenance of Process Instrumentation, Filter Replacement)	0.69

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B-5 Ratio Test

Step 6: Is the following inequality true?

$$\frac{GLC_{max}}{ESL} \leq \frac{ER_P}{ER_S}$$

where:

GLC_{max} = The maximum ground level concentration for the appropriate averaging time, in µg/m^3.
ESL = The effects screening level for the appropriate averaging time, in µg/m^3.
ER_P = The project increase, in lb/hr or tpy.
ER_S = The proposed site-wide emissions, in lb/hr or tpy.

- **If "No" → Step 7.**
- **If "Yes" → Step 8. The MERA is complete.**

1-hr Ammonia		
1-hour GLCmax =	38.48	ug/m3
1-hour ESL =	180	ug/m3
ERp =	5.93	lb/hr
ERs =	18.46	lb/hr
GLCmax/ESL =	0.21	
ERp/ERs =	0.32	
Pass Ratio Test?	yes => MERA Complete	