



10/29/2014

Normand Paquette
LINDE GAS NORTH AMERICA, LLC
2226 NAVARRE RD
Oregon, OH 43616

RE: FINALAIR POLLUTION PERMIT-TO-INSTALL AND OPERATE

Facility ID: 0448020085
Permit Number: P0117759
Permit Type: Renewal
County: Lucas

Dear Permit Holder:

Enclosed please find a final Ohio Environmental Protection Agency (EPA) Air Pollution Permit-to-Install and Operate (PTIO) which will allow you to install, modify, and/or operate the described emissions unit(s) in the manner indicated in the permit. Because this permit contains conditions and restrictions, please read it very carefully. In this letter you will find the information on the following topics:

- **How to appeal this permit**
- **How to save money, reduce pollution and reduce energy consumption**
- **How to give us feedback on your permitting experience**
- **How to get an electronic copy of your permit**

How to appeal this permit

The issuance of this PTIO is a final action of the Director and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. The appeal must be filed with the Commission within thirty (30) days after notice of the Director's action. The appeal must be accompanied by a filing fee of \$70.00, made payable to "Ohio Treasurer Josh Mandel," which the Commission, in its discretion, may reduce if by affidavit you demonstrate that payment of the full amount of the fee would cause extreme hardship. Notice of the filing of the appeal shall be filed with the Director within three (3) days of filing with the Commission. Ohio EPA requests that a copy of the appeal be served upon the Ohio Attorney General's Office, Environmental Enforcement Section. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission
77 South High Street, 17th Floor
Columbus, OH 43215

Certified Mail

No	TOXIC REVIEW
No	SYNTHETIC MINOR TO AVOID MAJOR NSR
Yes	CEMS
No	MACT/GACT
No	NSPS
No	NESHAPS
No	NETTING
No	MODELING SUBMITTED
No	SYNTHETIC MINOR TO AVOID TITLE V
No	FEDERALLY ENFORCABLE PTIO (FEPTIO)
No	SYNTHETIC MINOR TO AVOID MAJOR GHG

How to save money, reduce pollution and reduce energy consumption

The Ohio EPA is encouraging companies to investigate pollution prevention and energy conservation. Not only will this reduce pollution and energy consumption, but it can also save you money. If you would like to learn ways you can save money while protecting the environment, please contact our Office of Compliance Assistance and Pollution Prevention at (614) 644-3469. Additionally, all or a portion of the capital expenditures related to installing air pollution control equipment under this permit may be eligible for financing and State tax exemptions through the Ohio Air Quality Development Authority (OAQDA) under Ohio Revised Code Section 3706. For more information, see the OAQDA website: www.ohioairquality.org/clean_air

How to give us feedback on your permitting experience

Please complete a survey at www.epa.ohio.gov/survey.aspx and give us feedback on your permitting experience. We value your opinion.

How to get an electronic copy of your permit

This permit can be accessed electronically via the eBusiness Center: Air Services in Microsoft Word format or in Adobe PDF on the Division of Air Pollution Control (DAPC) Web page, www.epa.ohio.gov/dapc by clicking the "Search for Permits" link under the Permitting topic on the Programs tab.

If you have any questions, please contact Toledo Department of Environmental Services at (419)936-3015 or the Office of Compliance Assistance and Pollution Prevention at (614) 644-3469.

Sincerely,



Erica R. Engel-Ishida, Manager
Permit Issuance and Data Management Section, DAPC

Cc: TDES



FINAL

**Division of Air Pollution Control
Permit-to-Install and Operate
for
LINDE GAS NORTH AMERICA, LLC**

Facility ID:	0448020085
Permit Number:	P0117759
Permit Type:	Renewal
Issued:	10/29/2014
Effective:	10/29/2014
Expiration:	10/29/2024



Division of Air Pollution Control
Permit-to-Install and Operate
for
LINDE GAS NORTH AMERICA, LLC

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Final Permit-to-Install and Operate
LINDE GAS NORTH AMERICA, LLC
Permit Number: P0117759
Facility ID: 0448020085
Effective Date: 10/29/2014

Authorization

Facility ID: 0448020085
Application Number(s): A0051613
Permit Number: P0117759
Permit Description: Transition out of Title V to State-Only PTIO
Permit Type: Renewal
Permit Fee: \$0.00
Issue Date: 10/29/2014
Effective Date: 10/29/2014
Expiration Date: 10/29/2024
Permit Evaluation Report (PER) Annual Date: July 1 - June 30, Due Aug 15

This document constitutes issuance to:

LINDE GAS NORTH AMERICA, LLC
2226 NAVARRE RD
Oregon, OH 43616

of a Permit-to-Install and Operate for the emissions unit(s) identified on the following page.

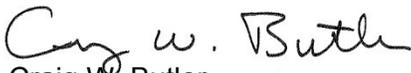
Ohio Environmental Protection Agency (EPA) District Office or local air agency responsible for processing and administering your permit:

Toledo Department of Environmental Services
348 South Erie Street
Toledo, OH 43604
(419)936-3015

The above named entity is hereby granted this Permit-to-Install and Operate for the air contaminant source(s) (emissions unit(s)) listed in this section pursuant to Chapter 3745-31 of the Ohio Administrative Code. Issuance of this permit does not constitute expressed or implied approval or agreement that, if constructed or modified in accordance with the plans included in the application, the described emissions unit(s) will operate in compliance with applicable State and federal laws and regulations.

This permit is granted subject to the conditions attached hereto.

Ohio Environmental Protection Agency


Craig W. Butler
Director



Final Permit-to-Install and Operate
 LINDE GAS NORTH AMERICA, LLC
Permit Number: P0117759
Facility ID: 0448020085
Effective Date: 10/29/2014

Authorization (continued)

Permit Number: P0117759
 Permit Description: Transition out of Title V to State-Only PTIO

Permits for the following Emissions Unit(s) or groups of Emissions Units are in this document as indicated below:

Group Name: P001, P002

Emissions Unit ID:	P001
Company Equipment ID:	Hydrogen Plant
Superseded Permit Number:	P0116693
General Permit Category and Type:	Not Applicable
Emissions Unit ID:	P002
Company Equipment ID:	Hydrogen Plant
Superseded Permit Number:	P0116693
General Permit Category and Type:	Not Applicable



Final Permit-to-Install and Operate
LINDE GAS NORTH AMERICA, LLC
Permit Number: P0117759
Facility ID: 0448020085
Effective Date: 10/29/2014

A. Standard Terms and Conditions



1. What does this permit-to-install and operate ("PTIO") allow me to do?

This permit allows you to install and operate the emissions unit(s) identified in this PTIO. You must install and operate the unit(s) in accordance with the application you submitted and all the terms and conditions contained in this PTIO, including emission limits and those terms that ensure compliance with the emission limits (for example, operating, recordkeeping and monitoring requirements).

2. Who is responsible for complying with this permit?

The person identified on the "Authorization" page, above, is responsible for complying with this permit until the permit is revoked, terminated, or transferred. "Person" means a person, firm, corporation, association, or partnership. The words "you," "your," or "permittee" refer to the "person" identified on the "Authorization" page above.

The permit applies only to the emissions unit(s) identified in the permit. If you install or modify any other equipment that requires an air permit, you must apply for an additional PTIO(s) for these sources.

3. What records must I keep under this permit?

You must keep all records required by this permit, including monitoring data, test results, strip-chart recordings, calibration data, maintenance records, and any other record required by this permit for five years from the date the record was created. You can keep these records electronically, provided they can be made available to Ohio EPA during an inspection at the facility. Failure to make requested records available to Ohio EPA upon request is a violation of this permit requirement.

4. What are my permit fees and when do I pay them?

There are two fees associated with permitted air contaminant sources in Ohio:

PTIO fee. This one-time fee is based on a fee schedule in accordance with Ohio Revised Code (ORC) section 3745.11, or based on a time and materials charge for permit application review and permit processing if required by the Director.

You will be sent an invoice for this fee after you receive this PTIO and payment is due within 30 days of the invoice date. You are required to pay the fee for this PTIO even if you do not install or modify your operations as authorized by this permit.

Annual emissions fee. Ohio EPA will assess a separate fee based on the total annual emissions from your facility. You self-report your emissions in accordance with Ohio Administrative Code (OAC) Chapter 3745-78. This fee assessed is based on a fee schedule in ORC section 3745.11 and funds Ohio EPA's permit compliance oversight activities. For facilities that are permitted as synthetic minor sources, the fee schedule is adjusted annually for inflation. Ohio EPA will notify you when it is time to report your emissions and to pay your annual emission fees.

5. When does my PTIO expire, and when do I need to submit my renewal application?

This permit expires on the date identified at the beginning of this permit document (see "Authorization" page above) and you must submit a renewal application to renew the permit. Ohio EPA will send a renewal notice to you approximately six months prior to the expiration date of this permit. However, it is



very important that you submit a complete renewal permit application (postmarked prior to expiration of this permit) even if you do not receive the renewal notice.

If a complete renewal application is submitted before the expiration date, Ohio EPA considers this a timely application for purposes of ORC section 119.06, and you are authorized to continue operating the emissions unit(s) covered by this permit beyond the expiration date of this permit until final action is taken by Ohio EPA on the renewal application.

6. What happens to this permit if my project is delayed or I do not install or modify my source?

This PTIO expires 18 months after the issue date identified on the "Authorization" page above unless otherwise specified if you have not (1) started constructing the new or modified emission sources identified in this permit, or (2) entered into a binding contract to undertake such construction. This deadline can be extended by up to 12 months, provided you apply to Ohio EPA for this extension within a reasonable time before the 18-month period has ended and you can show good cause for any such extension.

7. What reports must I submit under this permit?

An annual permit evaluation report (PER) is required in addition to any malfunction reporting required by OAC rule 3745-15-06 or other specific rule-based reporting requirement identified in this permit. Your PER due date is identified in the Authorization section of this permit.

8. If I am required to obtain a Title V operating permit in the future, what happens to the operating provisions and PER obligations under this permit?

If you are required to obtain a Title V permit under OAC Chapter 3745-77 in the future, the permit-to-operate portion of this permit will be superseded by the issued Title V permit. From the effective date of the Title V permit forward, this PTIO will effectively become a PTI (permit-to-install) in accordance with OAC rule 3745-31-02(B). The following terms and conditions of this permit will no longer be applicable after issuance of the Title V permit: Section B, Term 1.b) and Section C, for each emissions unit, Term a)(2).

The PER requirements in this permit remain effective until the date the Title V permit is issued and is effective, and cease to apply after the effective date of the Title V permit. The final PER obligation will cover operations up to the effective date of the Title V permit and must be submitted on or before the submission deadline identified in this permit on the last day prior to the effective date of the Title V permit.

9. What are my obligations when I perform scheduled maintenance on air pollution control equipment?

You must perform scheduled maintenance of air pollution control equipment in accordance with OAC rule 3745-15-06(A). If scheduled maintenance requires shutting down or bypassing any air pollution control equipment, you must also shut down the emissions unit(s) served by the air pollution control equipment during maintenance, unless the conditions of OAC rule 3745-15-06(A)(3) are met. Any emissions that exceed permitted amount(s) under this permit (unless specifically exempted by rule) must be reported as deviations in the annual permit evaluation report (PER), including nonexempt excess emissions that occur during approved scheduled maintenance.



10. Do I have to report malfunctions of emissions units or air pollution control equipment? If so, how must I report?

If you have a reportable malfunction of any emissions unit(s) or any associated air pollution control system, you must report this to the [DO/LAA] in accordance with OAC rule 3745-15-06(B). Malfunctions that must be reported are those that result in emissions that exceed permitted emission levels. It is your responsibility to evaluate control equipment breakdowns and operational upsets to determine if a reportable malfunction has occurred.

If you have a malfunction, but determine that it is not a reportable malfunction under OAC rule 3745-15-06(B), it is recommended that you maintain records associated with control equipment breakdown or process upsets. Although it is not a requirement of this permit, Ohio EPA recommends that you maintain records for non-reportable malfunctions.

11. Can Ohio EPA or my local air agency inspect the facility where the emission unit(s) is/are located?

Yes. Under Ohio law, the Director or his authorized representative may inspect the facility, conduct tests, examine records or reports to determine compliance with air pollution laws and regulations and the terms and conditions of this permit. You must provide, within a reasonable time, any information Ohio EPA requests either verbally or in writing.

12. What happens if one or more emissions units operated under this permit is/are shut down permanently?

Ohio EPA can terminate the permit terms associated with any permanently shut down emissions unit. "Shut down" means the emissions unit has been physically removed from service or has been altered in such a way that it can no longer operate without a subsequent "modification" or "installation" as defined in OAC Chapter 3745-31.

You should notify Ohio EPA of any emissions unit that is permanently shut down by submitting a certification that identifies the date on which the emissions unit was permanently shut down. The certification must be submitted by an authorized official from the facility. You cannot continue to operate an emission unit once the certification has been submitted to Ohio EPA by the authorized official.

You must comply with all recordkeeping and reporting for any permanently shut down emissions unit in accordance with the provisions of the permit, regulations or laws that were enforceable during the period of operation, such as the requirement to submit a PER, air fee emission report, or malfunction report. You must also keep all records relating to any permanently shutdown emissions unit, generated while the emissions unit was in operation, for at least five years from the date the record was generated.

Again, you cannot resume operation of any emissions unit certified by the authorized official as being permanently shut down without first applying for and obtaining a permit pursuant to OAC Chapter 3745-31.



13. Can I transfer this permit to a new owner or operator?

You can transfer this permit to a new owner or operator. If you transfer the permit, you must follow the procedures in OAC Chapter 3745-31, including notifying Ohio EPA or the local air agency of the change in ownership or operator. Any transferee of this permit must assume the responsibilities of the transferor permit holder.

14. Does compliance with this permit constitute compliance with OAC rule 3745-15-07, "air pollution nuisance"?

This permit and OAC rule 3745-15-07 prohibit operation of the air contaminant source(s) regulated under this permit in a manner that causes a nuisance. Ohio EPA can require additional controls or modification of the requirements of this permit through enforcement orders or judicial enforcement action if, upon investigation, Ohio EPA determines existing operations are causing a nuisance.

15. What happens if a portion of this permit is determined to be invalid?

If a portion of this permit is determined to be invalid, the remainder of the terms and conditions remain valid and enforceable. The exception is where the enforceability of terms and conditions are dependent on the term or condition that was declared invalid.



Final Permit-to-Install and Operate
LINDE GAS NORTH AMERICA, LLC
Permit Number: P0117759
Facility ID: 0448020085
Effective Date: 10/29/2014

B. Facility-Wide Terms and Conditions



Final Permit-to-Install and Operate
LINDE GAS NORTH AMERICA, LLC
Permit Number: P0117759
Facility ID: 0448020085
Effective Date: 10/29/2014

1. This permit document constitutes a permit-to-install issued in accordance with ORC 3704.03(F) and a permit-to-operate issued in accordance with ORC 3704.03(G).
 - a) For the purpose of a permit-to-install document, the facility-wide terms and conditions identified below are federally enforceable with the exception of those listed below which are enforceable under state law only.
 - (1) None.
 - b) For the purpose of a permit-to-operate document, the facility-wide terms and conditions identified below are enforceable under state law only with the exception of those listed below which are federally enforceable.
 - (1) None.



Final Permit-to-Install and Operate
LINDE GAS NORTH AMERICA, LLC
Permit Number: P0117759
Facility ID: 0448020085
Effective Date: 10/29/2014

C. Emissions Unit Terms and Conditions



1. Emissions Unit Group -P001, P002: P001,P002,

EU ID	Operations, Property and/or Equipment Description
P001	Hydrogen Reformer Train 1 - 514 MMBtu/hr methane steam reformer train with low NOx burners and selective catalytic reduction (SCR) control device.
P002	Hydrogen Reformer Train 2 - 514 MMBtu/hr methane steam reformer train with low NOx burners and selective catalytic reduction (SCR) control device.

a) This permit document constitutes a permit-to-install issued in accordance with ORC 3704.03(F) and a permit-to-operate issued in accordance with ORC 3704.03(G).

(1) For the purpose of a permit-to-install document, the emissions unit terms and conditions identified below are federally enforceable with the exception of those listed below which are enforceable under state law only.

a. d)(14), d)(15), d)(16), d)(17) and e)(7).

(2) For the purpose of a permit-to-operate document, the emissions unit terms and conditions identified below are enforceable under state law only with the exception of those listed below which are federally enforceable.

a. None.

b) Applicable Emissions Limitations and/or Control Requirements

(1) The specific operation(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures are identified below. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
Stack Emissions		
a.	OAC rule 3745-17-07(A)(1)	Visible particulate emissions from any stack shall not exceed 20% opacity as a six-minute average, unless otherwise specified by the rule
b.	OAC rule 3745-17-11(B)(1)	See b)(2)a.
c.	OAC rule 3745-18-06(E)(2)	See b)(2)a.
d.	OAC rule 3745-31-05(A)(3)	5.65 lb/hr nitrogen oxides (NOx) measured as NO ₂ corrected to 3% O ₂ in flue gas, on a dry basis as a rolling 24 hour average, and 19.81 tons per year; 5.49 lb/hr carbon monoxide (CO) and



	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
		24.07 tons per year; 3.56 lb/hr volatile organic compounds (VOC) and 15.59 tons per year; 3.56 lb/hr particulate matter less than or equal to 10 microns (PM ₁₀) and 15.59 tons per year; 2.97 lb/hr sulfur dioxide (SO ₂) as a 24 hour average; and 10 ppmv ammonia corrected to 15% oxygen on a dry basis and 11.39 tons per year. See b)(2)b., b)(2)c (except for NOx and SO ₂), b)(2)d. and b)(2)e.
e.	OAC rule 3745-31-05(F)	2.76 tons per year of SO ₂
<i>deaerator vent emissions</i>		
f.	OAC rule 3745-31-05(A)(3)	1.83 lb/hr and 8.00 TPY CO; 0.51 lb/hr and 2.22 TPY VOC (as methanol); 0.34 lb/hr and 1.50 TPY ammonia See b)(2)c.

(2) Additional Terms and Conditions

- a. The emission limitation specified by this rule is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3)
- b. The permittee shall not burn in any fuel gas combustion device, any fuel gas that contains hydrogen sulfide (H₂S) in excess of 230 milligrams per dry standard cubic meter (0.10 grain per dry standard cubic foot or 159 ppmv at 14.7 psia and 60°F).
- c. The pound per hour and ton per year emission limitations were established for PTI purposes to reflect the potential to emit for each emissions unit (P001 and



P002). Therefore, it is not necessary to develop record keeping and/or reporting requirements to ensure compliance with this limitation.

- d. The permittee shall maintain a written quality assurance/quality control plan for the continuous NO_x monitoring system, designed to ensure continuous valid and representative readings of NO_x emissions in units of the applicable standard(s). The plan shall follow the requirements of 40 CFR Part 60, Appendix F. The quality assurance/quality control plan and a logbook dedicated to the continuous NO_x monitoring system must be kept on site and available for inspection during regular office hours.

The plan shall include the requirement to conduct quarterly cylinder gas audits or relative accuracy audits as required in 40 CFR Part 60; and to conduct relative accuracy test audits in units of the standard(s), in accordance with and at the frequencies required per 40 CFR Part 60.

- e. The continuous emission monitoring system consists of all the equipment used to acquire data to provide a record of emissions and includes the sample extraction and transport hardware, sample conditioning hardware, analyzers, and data recording/processing hardware and software.

c) Operational Restrictions

- (1) The permittee shall burn only refinery fuel gas, natural gas and/or process Pressure Swing Absorption (PSA) purge gas in this emissions unit.
- (2) The quality of the refinery fuel gas burned in this emissions unit shall meet a hydrogen sulfide content which is sufficient to comply with a volume-weighted, daily average H₂S concentration no greater than 230 milligrams per dry standard cubic meter (0.10 grain per dry standard cubic foot or 159 ppmv at 14.7 psia and 60°F). The process Pressure Swing Absorption (PSA) purge gas burned in this emissions unit shall meet a hydrogen sulfide content of 0.20 ppmv.
- (3) The permittee shall operate the selective catalytic reduction (SCR) unit whenever this emissions unit is in operation.
- (4) The permittee shall not exceed the molar based ratio of ammonia to nitrogen oxides established during the most recent stack test during which compliance with the ammonia slip limitation was demonstrated: 1.4 for P001 and 1.6 for P002 as tested on March 5 and 6, 2013. Operation of the SCR at an ammonia to nitrogen oxides ratio greater than the ratio specified above does not by itself constitute a violation of the mass ammonia emissions limitation, but rather serves as an indicator of the need for additional stack testing and/or further investigation to establish compliance with the emission limitation.

d) Monitoring and/or Recordkeeping Requirements

- (1) **ALL FUELS COMBUSTED**
For each day during which the permittee burns a fuel other than refinery fuel gas, natural gas and/or Pressure Swing Absorption (PSA) purge gas, the permittee shall maintain a



record of the type, quantity, sulfur content in pound(s) of sulfur per mmdscf, and heating value in Btu/dscf of the fuel burned.

(2) **REFINERY FUEL GAS TERMS**

The permittee shall collect or require the refinery fuel gas supplier to collect daily a representative sample of the refinery fuel gas that is received for burning in this emissions unit. The permittee shall perform or require the supplier to perform analyses of each daily refinery fuel gas sample for sulfur content, heat content and density in accordance with the appropriate ASTM methods.

(3) The permittee shall maintain daily records of the density of the refinery fuel gas, the actual heating value of the refinery fuel gas, and the mass decimal fraction of sulfur in the refinery fuel gas as burned in this emissions unit.

The actual heating value (H) and density (D) of the refinery fuel gas shall be calculated as follows from the results of a daily refinery fuel gas compositional analysis using gas chromatography:

$H = \text{summation of } (h_i \times m_i)$

m_i = the mass fraction of each chemical compound detected in the refinery fuel gas using chromatographic analysis; and

h_i = the heat content of each chemical compound detected in the refinery fuel gas, in Btu per pound of chemical.

$D = (P \times M) / (10.73 \times T)$

where:

10.73 = ideal gas constant with units of psia - cubic feet/lb mole - degrees Rankine

P = the refinery fuel gas line pressure, in psia;

T = the refinery fuel gas line temperature, in degrees Rankine; and

M = the molecular weight of refinery fuel gas, in lb/lb mole.

The molecular weight of the gas shall be calculated as follows:

$M = \text{summation of } (MW_i \times f_i)$

where:

MW_i = the molecular weight of each chemical component of the refinery fuel gas, in lb/lb mole; and

f_i = the mole fraction of each chemical compound detected in the refinery fuel gas using gas chromatographic analysis.



As an alternative, the permittee may require the refinery fuel gas supplier to provide the above information.

- (4) The permittee shall install a hydrogen sulfide continuous emission monitor or require the refinery fuel gas supplier to provide a volume-weighted 24 hour daily average of the hydrogen sulfide CEMS data, in ppm and identify the H₂S CEM monitor. The CEMs data is only required when refinery fuel gas is used as a fuel to the reformer.
- (5) When refinery fuel gas is used as a fuel, the permittee shall maintain daily records of the 24 hour daily average of the decimal (mass) fraction of sulfur in the refinery gas. The decimal (mass) fraction of sulfur shall be calculated as follows:

$$S = (A_{H_2S} / 1 \times 10^6) \times 0.9408$$

where:

A_{H₂S} = 24 hour daily average of the H₂S CEMS data, in ppm; and

0.9408 = the pound of sulfur per pound of hydrogen sulfide

- (6) When refinery fuel gas is used as a fuel, the permittee shall maintain daily records of the calculated, 24 hour daily SO₂ emission rate for the refinery fuel gas based upon the daily average of the sulfur content, daily heat content value, and daily density value of the refinery fuel gas. The SO₂ emission rate shall be calculated as follows, in accordance with OAC rule 3745-18-04(F)(3):

$$ERG = (1 \times 10^6 / H) \times (D) \times (S) \times (1.998)$$

where:

ERG = each 24 hour daily average SO₂ emission rate, in pounds of SO₂ per mmBtu;

H = the calculated daily average heat value of the fuel, in Btu/dscf of refinery fuel gas;

D = the density value of the fuel, in pounds per dscf of refinery fuel gas; and

S = each 24 hour daily average decimal (mass) fraction of sulfur in the refinery fuel gas

- (7) The permittee shall monitor and record the hourly, daily, and monthly total flow rate of refinery fuel gas, process PSA purge gas, and natural gas, in terms of standard cubic feet per hour. The flow monitoring device shall be certified to have an accuracy of plus or minus 2% of the upper range value across the range of the fuel flow rate to be measured at the unit.
- (8) **PSA PURGE GAS**
The permittee shall analyze the reformer feed gas at least once each month for the presence of hydrogen sulfide during normal operation in order to ensure the absence of sulfur in the PSA Purge Gas. If the analyses show that the hydrogen sulfide content is 0.20 ppmv or less for 6 consecutive calendar months of normal operation, the required frequency of analyses for the presence of hydrogen sulfide in the reformer feed gas may be reduced to quarterly (once every 3 calendar months, when the emissions unit is in



operation). If a subsequent analysis by the permittee indicates the presence of hydrogen sulfide greater than 0.20 ppmv, the permittee shall calculate the potential sulfur dioxide emissions from the reformer furnace based on combustion of the process PSA purge gas at maximum capacity. The permittee shall also revert to testing for the presence of hydrogen sulfide in the reformer feed gas on a monthly basis until the hydrogen sulfide content is 0.20 ppmv or less for 6 consecutive calendar months of normal operation.

- (9) SCR
The permittee shall maintain daily records that document any time periods when the SCR was not in service when the emissions unit was in operation.
- (10) The permittee shall operate and maintain equipment to continuously monitor and record the molar based ratio of ammonia to nitrogen oxides in this emissions unit as a rolling, 3-hour average.
- (11) NOx CEM
The permittee shall operate and maintain existing equipment to continuously monitor and record NOx emissions from this emissions unit in pound per million Btu of heat input. Such continuous monitoring and recording equipment shall comply with the requirements specified in 40 CFR Part 60.13.

The permittee shall maintain records of all data obtained by the continuous NOx monitoring system including, but not limited to:

- a. emissions of NOx in parts per million for each cycle time of the analyzer, with no resolution less than one data point per minute required;
- b. emissions of NOx in pounds per hour and in units of the applicable standard(s) in the appropriate averaging period;
- c. results of quarterly cylinder gas audits;
- d. results of daily zero/span calibration checks and the magnitude of manual calibration adjustments;
- e. results of required relative accuracy test audit(s), including results in units of the applicable standard(s);
- f. hours of operation of the emissions unit, continuous NOx monitoring system, and control equipment;
- g. the date, time, and hours of operation of the emissions unit without the control equipment and/or the continuous NOx monitoring system;
- h. the date, time, and hours of operation of the emissions unit during any malfunction of the control equipment and/or the continuous NOx monitoring system; as well as,
- i. the reason (if known) and the corrective actions taken (if any) for each such event in (g) and (h).



All valid data points generated and recorded by the continuous emission monitoring and data acquisition and handling system shall be used in the calculation of the pollutant concentration and/or emission rate over the appropriate averaging period.

- (12) The permittee shall maintain records of all data obtained by the continuous NOx monitoring system including, but not limited to, parts per million NOx on an instantaneous (one-minute) basis, the hourly fuel flow rate and Fd-factor of the combined fuel being fired by the emissions unit, and the emissions of NOx in units of pound per million Btu of heat input in the appropriate averaging period (e.g., hourly), results of daily zero/span calibration checks, and magnitude of manual calibration adjustments. The Fd-factor shall be determined through the use of an on-line gas chromatograph that is installed, operated and maintained according to the manufacturer's recommendations, and guidance using the applicable methodology provided in 40 CFR Part 60, Appendix A, Test Method 19, Section 12.

Additionally, a record of total hourly and total monthly heat input (in terms of million Btu) for this emissions unit shall be determined using term d)(7) required fuel-flow monitors and f-factors as determined above. The total monthly heat input shall be a sum of the hourly heat input records.

The permittee shall also maintain records of hourly NOx emissions in pounds per hour. The permittee shall multiply the hourly heat input in million Btu per hour (as recorded above) by the pound NOx per million Btu of heat input from the CEM to determine the NOx emissions in units of pounds per hour.

- (13) **ALL FUELS COMBUSTED RECORDKEEPING**
The permittee shall maintain records of the following information:
- a. The hourly feed rate (Q-factor) and Fd-factor (as defined in 40 CFR 60, Appendix A, Method 19, section 12) of the combined fuels shall be monitored and recorded. These are required for the calculation of the NOx emission rate.

- (14) **AIR TOXICS**
The permit to install and operate application for these emissions unit(s), P001 and P002, was evaluated based on the actual materials and the design parameters of the emissions unit's(s') exhaust system, as specified by the permittee. The "Toxic Air Contaminant Statute", ORC 3704.03(F), was applied to this/these emissions unit(s) for each toxic air contaminant listed in OAC rule 3745-114-01, using data from the permit application; and modeling was performed for each toxic air contaminant(s) emitted at over one ton per year using an air dispersion model such as SCREEN3, AERMOD, or ISCST3, or other Ohio EPA approved model. The predicted 1-hour maximum ground level concentration result(s) from the approved air dispersion model, was compared to the Maximum Acceptable Ground Level Concentration (MAGLC), calculated as described in the Ohio EPA guidance document entitled "Review of New Sources of Air Toxic Emissions, Option A", as follows:

- a. the exposure limit, expressed as a time-weighted average concentration for a conventional 8-hour workday and a 40-hour workweek, for each toxic compound(s) emitted from the emissions unit(s), (as determined from the raw materials processed and/or coatings or other materials applied) has been



documented from one of the following sources and in the following order of preference (TLV was and shall be used, if the chemical is listed):

- i. threshold limit value (TLV) from the American Conference of Governmental Industrial Hygienists (ACGIH) "Threshold Limit Values for Chemical Substances and Physical Agents Biological Exposure Indices"; or
- ii. STEL (short term exposure limit) or the ceiling value from the American Conference of Governmental Industrial Hygienists (ACGIH) "Threshold Limit Values for Chemical Substances and Physical Agents Biological Exposure Indices"; the STEL or ceiling value is multiplied by 0.737 to convert the 15-minute exposure limit to an equivalent 8-hour TLV.

b. The TLV is divided by ten to adjust the standard from the working population to the general public (TLV/10).

c. This standard was then adjusted to account for the duration of the exposure or the operating hours of the emissions unit(s), i.e., "24" hours per day and "7" days per week, from that of 8 hours per day and 5 days per week. The resulting calculation shall be used to determine the Maximum Acceptable Ground-Level Concentration (MAGLC):

$$TLV/10 \times 8/24 \times 5/7 = 4 TLV/168 = TLV/42 = MAGLC$$

d. The following summarizes the results of dispersion modeling for the significant toxic contaminants (emitted at 1 or more tons/year) or "worst case" toxic contaminant(s):

i. Toxic Contaminant: ammonia – 25.50 TPY (max) for P001 and P002.

TLV (mg/m³): 17.413

Maximum Hourly Emission Rate (lbs/hr): 5.88 (combined)

Predicted 1-Hour Maximum Ground Level Concentration (ug/m³): 0.004

MAGLC (ug/m³): 0.415

ii. Toxic Contaminant: methanol – 4.44 TPY for P001 and P002.

TLV (mg/m³): 262.1

Maximum Hourly Emission Rate (lbs/hr): 1.02 (combined)

Predicted 1-Hour Maximum Ground Level Concentration (ug/m³): 0.054

MAGLC (ug/m³): 6.240

The permittee, has demonstrated that emissions of ammonia and methanol, from emissions units P001 and P002, are calculated to be less than eighty per cent of the



maximum acceptable ground level concentration (MAGLC); any new raw material or processing agent shall not be applied without evaluating each component toxic air contaminant in accordance with the "Toxic Air Contaminant Statute", ORC 3704.03(F).

- (15) Prior to making any physical changes to or changes in the method of operation of the emissions unit(s), that could impact the parameters or values that were used in the predicted 1-hour maximum ground level concentration, the permittee shall re-model the change(s) to demonstrate that the MAGLC has not been exceeded. Changes that can affect the parameters/values used in determining the 1-hour maximum ground-level concentration include, but are not limited to, the following:
- a. changes in the composition of the materials used or the use of new materials, that would result in the emission of a new toxic air contaminant with a lower Threshold Limit Value (TLV) than the lowest TLV previously modeled;
 - b. changes in the composition of the materials, or use of new materials, that would result in an increase in emissions of any toxic air contaminant listed in OAC rule 3745-114-01, that was modeled from the initial (or last) application; and
 - c. physical changes to the emissions unit(s) or its/their exhaust parameters (e.g., increased/ decreased exhaust flow, changes in stack height, changes in stack diameter, etc.).

If the permittee determines that the "Toxic Air Contaminant Statute" will be satisfied for the above changes, the Ohio EPA will not consider the change(s) to be a "modification" under OAC rule 3745-31-01 solely due to a non-restrictive change to a parameter or process operation, where compliance with the "Toxic Air Contaminant Statute", ORC 3704.03(F), has been documented. If the change(s) meet(s) the definition of a "modification", the permittee shall apply for and obtain a final PTIO prior to the change. The Director may consider any significant departure from the operations of the emissions unit, described in the permit application, as a modification that results in greater emissions than the emissions rate modeled to determine the ground level concentration; and he/she may require the permittee to submit a permit application for the increased emissions.

- (16) The permittee shall collect, record, and retain the following information for each toxic evaluation conducted to determine compliance with the "Toxic Air Contaminant Statute", ORC 3704.03(F):
- a. a description of the parameters/values used in each compliance demonstration and the parameters or values changed for any re-evaluation of the toxic(s) modeled (the composition of materials, new toxic contaminants emitted, change in stack/exhaust parameters, etc.);
 - b. the Maximum Acceptable Ground Level Concentration (MAGLC) for each significant toxic contaminant or worst-case contaminant, calculated in accordance with the "Toxic Air Contaminant Statute", ORC 3704.03(F);
 - c. a copy of the computer model run(s), that established the predicted 1-hour maximum ground level concentration that demonstrated the emissions unit(s) to



be in compliance with the "Toxic Air Contaminant Statute", ORC 3704.03(F), initially and for each change that requires re-evaluation of the toxic air contaminant emissions; and

- d. the documentation of the initial evaluation of compliance with the "Toxic Air Contaminant Statute", ORC 3704.03(F), and documentation of any determination that was conducted to re-evaluate compliance due to a change made to the emissions unit(s) or the materials applied.

- (17) The permittee shall maintain a record of any change made to a parameter or value used in the dispersion model, used to demonstrate compliance with the "Toxic Air Contaminant Statute", ORC 3704.03(F), through the predicted 1-hour maximum ground level concentration. The record shall include the date and reason(s) for the change and if the change would increase the ground-level concentration.

e) Reporting Requirements

(1) ALL FUELS COMBUSTED

The permittee shall submit deviation (excursion) reports that identify each day when a fuel other than refinery fuel gas, natural gas and/or PSA purge gas was burned in this emissions unit. Each report shall be submitted within 30 days after the deviation occurs.

(2) REFINERY FUEL GAS

The permittee shall submit quarterly deviation (excursion) reports that identify each 24 hour daily SO₂ emission rate, as calculated in d)(6) for refinery fuel gas combined with d)(8) for PSA purge gas, that exceeds the SO₂ emission limitation of 2.97 lb SO₂ per hour.

(3) PSA PURGE GAS

The permittee shall notify the Toledo Division of Environmental Services in writing of any analysis of the process PSA purge gas that exceeded 0.20 ppmv of H₂S. The notification shall include a copy of such record and shall be sent to the Toledo Division of Environmental Services within 30 days after the event occurs.

(4) SCR

The permittee shall notify the Toledo Division of Environmental Services in writing of any daily record(s):

- a. showing that the SCR was not in service when the emissions unit was in operation; and/or
- b. showing that the molar based ratio of ammonia to nitrogen oxides as a 3-hour average exceeds the maximum ammonia slip limitation established during the most recent stack test which demonstrated compliance with the ammonia slip limitation.

The notification shall include a copy of such record and shall be sent to the Toledo Division of Environmental Services within 30 days after the event occurs.



(5) NOx CEM

The permittee shall comply with the following quarterly reporting requirements for the emissions unit and its continuous NOx monitoring system:

- a. Pursuant to the monitoring, record keeping, and reporting requirements for continuous monitoring systems contained in 40 CFR 60.7 and 60.13(h) and the requirements established in this permit, the permittee shall submit reports within 30 days following the end of each calendar quarter to the appropriate Ohio EPA District Office or local air agency, documenting all instances of NOx emissions in excess of any applicable limit specified in this permit, 40 CFR Part 60, OAC Chapters 3745-14 and 3745-23, and any other applicable rules or regulations. The report shall document the date, commencement and completion times, duration, and magnitude of each exceedance, as well as the reason (if known) and the corrective actions taken (if any) for each exceedance. Excess emissions shall be reported in units of the applicable standard(s).
- b. These quarterly reports shall be submitted by January 30, April 30, July 30, and October 30 of each year and shall include the following:
 - i. the facility name and address;
 - ii. the manufacturer and model number of the continuous NOx and other associated monitors;
 - iii. a description of any change in the equipment that comprises the continuous emission monitoring system (CEMS), including any change to the hardware, changes to the software that may affect CEMS readings, and/or changes in the location of the CEMS sample probe;
 - iv. the excess emissions report (EER)*, i.e., a summary of any exceedances during the calendar quarter, as specified above;
 - v. the total NOx emissions for the calendar quarter (tons);
 - vi. the total operating time (hours) of the emissions unit;
 - vii. the total operating time of the continuous NOx monitoring system while the emissions unit was in operation;
 - viii. results and dates of quarterly cylinder gas audits;
 - ix. unless previously submitted, results and dates of the relative accuracy test audit(s), including results in units of the applicable standard(s), (during appropriate quarter(s));
 - x. unless previously submitted, the results of any relative accuracy test audit showing the continuous NOx monitor out-of-control and the compliant results following any corrective actions;
 - xi. the date, time, and duration of any/each malfunction** of the continuous NOx monitoring system, emissions unit, and/or control equipment;



- xii. the date, time, and duration of any downtime** of the continuous NOx monitoring system and/or control equipment while the emissions unit was in operation; and
- xiii. the reason (if known) and the corrective actions taken (if any) for each event in b.xi. and xii.

Each report shall address the operations conducted and data obtained during the previous calendar quarter.

* where no excess emissions have occurred or the continuous monitoring system(s) has/have not been inoperative, repaired, or adjusted during the calendar quarter, such information shall be documented in the EER quarterly report

** each downtime and malfunction event shall be reported regardless if there is an exceedance of any applicable limit

- (6) If there are no excess NOx emissions during the calendar quarter, the permittee shall submit a statement to that effect along with the emissions unit operating time during the reporting period and the date, time, reason, and corrective action(s) taken for each time period of emissions unit, control equipment, and/or monitoring system malfunctions.

The total operating time of the emissions unit and the total operating time of the analyzer while the emissions unit was on line also shall be included in the quarterly report. These quarterly excess emission reports shall be submitted by January 30, April 30, July 30, and October 30 of each year and shall address the data obtained during the previous calendar quarter.

- (7) The permittee shall include any changes made to a parameter or value used in the dispersion model, that was used to demonstrate compliance with the Toxic Air Contaminant Statute, ORC 3704.03(F), through the predicted 1-hour maximum ground-level concentration, in the annual Permit Evaluation Report (PER). If no changes to the emissions, emissions unit(s), or the exhaust stack have been made, then the report shall include a statement to this effect.
- (8) The permittee shall submit an annual Permit Evaluation Report (PER) to the Ohio EPA District Office or Local Air Agency by the due date identified in the Authorization section of this permit. The permit evaluation report shall cover a reporting period of no more than twelve months for each air contaminant source identified in this permit.
- (9) The reports required by this permit may be submitted through the Ohio EPA's eBusiness Center: Air Services online web portal; or they may be mailed as a hard copy to the appropriate district office or local air agency.

f) Testing Requirements

- (1) Compliance with the Emissions Limitations and/or Control Requirements specified in section b) of these terms and conditions shall be determined in accordance with the following methods:



REFORMER STACK EMISSIONS:

a. Emission Limitation:

20% opacity as a 6-minute average

Applicable Compliance Method:

If required, compliance shall be demonstrated based upon the procedures specified in 40 CFR Part 60, Appendix A, Method 9 and OAC rule 3745-17-03(B)(1).

b. Emission Limitation:

5.65 pounds per hour NO_x, measured as NO₂ corrected to 3% O₂ in flue gas, on a dry basis as a rolling 24 hour average

Applicable Compliance Method:

The NO_x continuous emissions monitor (CEM) shall be used to demonstrate on-going compliance. The NO_x CEM shall be certified in units of pounds of NO_x per million Btu of heat input. The permittee shall calculate the NO_x emissions in units of pounds of NO_x per hour using the recorded process parameters in the calculation methodology of 40 CFR 60 Appendix A, Method 19, Section 12.

If required, compliance shall be demonstrated based upon the procedures specified in Methods 1 through 4 and 7 of 40 CFR Part 60, Appendix A. Alternative U.S. EPA-approved test methods can be used with prior approval from Ohio EPA.

c. Emission Limitation:

5.49 pounds per hour carbon monoxide (CO)

Applicable Compliance Method:

Multiply the manufacturer's supplied CO emission factor (0.0107 lb/mmBtu of fuel gas burned) by the daily average firing rate (mmBtu) per hour. If required, compliance shall be demonstrated based upon the procedures specified in Methods 1 through 4 and 10 of 40 CFR Part 60, Appendix A. Alternative U.S. EPA-approved test methods can be used with prior approval from Ohio EPA.

d. Emission Limitation:

3.56 pounds per hour volatile organic compounds (VOC)

Applicable Compliance Method:

Multiply the manufacturer's supplied VOC emission factor (0.0069 lb/mmBtu of fuel gas burned) by the daily average firing rate (mmBtu) per hour. If required, compliance shall be demonstrated based upon the procedures specified in



Methods 1 through 4 and 25 of 40 CFR Part 60, Appendix A. Alternative U.S. EPA-approved test methods can be used with prior approval from Ohio EPA.

e. Emission Limitation:

3.56 pound per hour PM₁₀ emissions

Applicable Compliance Method:

Multiply the manufacturer's supplied particulate matter emission factor (0.0069 lb/mmBtu of fuel gas burned) by the daily average firing rate (mmBtu) per hour. If required, compliance shall be demonstrated based upon the procedures specified in Methods 201 and 202 of 40 CFR Part 51, Appendix M, and the procedures specified in OAC rule 3745-17-03(B)(9). Alternative U.S. EPA-approved test methods can be used with prior approval from Ohio EPA.

f. Emission Limitation:

2.97 pound per hour SO₂, as 24 hour average

Applicable Compliance Method:

Compliance with the SO₂ hourly limitation shall be calculated as follows:

Calculate the sulfur dioxide emission rate for the RFG/natural gas and for the PSA purge gas, then add the two results together.

i.e. for the RFG and natural gas calculation:

$$(\text{Conc } H_2S_{\text{RFG\&NG}} \text{ ppmv } H_2S) * (34.08 \text{ lb}/385100000 \text{ ft}^3)/1 \text{ ppmv} * ((64 \text{ lb } SO_2/\text{lb-mole})/(34.08 \text{ lb } H_2S/\text{lb-mole})) * (FR_{\text{RFG\&NG}} \text{ mmscf/hr}) * (1000000 \text{ scf/mmscf}) = \text{pound per hour of } SO_2 \text{ from RFG \& NG}$$

likewise for the PSA purge gas

$$(\text{Conc } H_2S_{\text{PSA}} \text{ ppmv } H_2S) * (34.08 \text{ lb}/385100000 \text{ ft}^3)/1 \text{ ppmv} * ((64 \text{ lb } SO_2/\text{lb-mole})/(34.08 \text{ lb } H_2S/\text{lb-mole})) * (FR_{\text{PSA}} \text{ mmscf/hr}) * (1000000 \text{ scf/mmscf}) = \text{pound per hour of } SO_2 \text{ from PSA gas}$$

where:

$$MW \ H_2S = 34.08 \text{ lb/lb-mole} \quad MW \ SO_2 = 64 \text{ lb/lb-mole}$$

1 ppmv = MW/385,100,000 (lb/ft³) [AP-42, Appendix A, Miscellaneous Data and Conversion Factors (9/85)]

FR_{RFG&NG} = actual flow rate for RGF and natural gas for the day (mmscf/hr) from term d)(7)

FR_{PSA} = actual flow rate for PSA purge gas for the day (mmscf/hr) from term d)(7)



Conc $H_2S_{RFG\&NG}$ (ppmv) = the 24 hour daily average of the H_2S concentration from term d)(4)

Conc H_2S_{PSA} (ppmv) = the monthly average concentration of H_2S from the purge gas (ppmv) from term d)(8)

If required, compliance shall be demonstrated based upon the procedures specified in Method 6 or 6C of 40 CFR Part 60, Appendix A. Alternative U.S. EPA approved test methods can be used with prior approval from Ohio EPA.

g. Emission Limitation:

19.81 tons per year NOx

Applicable Compliance Method:

The NOx continuous emissions monitoring system and the recordkeeping in d)(7) and d)(11)-(13) shall serve as demonstration of compliance with this emissions limit. The annual emission limitation was developed by multiplying the average emission factor averaged from a two year period multiplied by the maximum heat input capacity of 514 mmBtu/hr multiplied by 8760 hr per year and divided by 2000 lb/ton.

h. Emission Limitation:

24.07 tons per year CO

Applicable Compliance Method:

The annual emission limitation was developed by multiplying the hourly allowable CO emission limitation (5.49 lbs/hr) by the maximum annual hours of operation (8760 hrs), and then dividing by 2000 lbs/ton. Therefore, if compliance is shown with the hourly limitation, compliance shall also be shown with the annual emission limitation.

i. Emission Limitation:

15.59 tons per year VOC

Applicable Compliance Method:

The annual emission limitation was developed by multiplying the hourly allowable VOC emission limitation (3.56 lbs/hr) by the maximum annual hours of operation (8760 hrs), and then dividing by 2000 lbs/ton. Therefore, if compliance is shown with the hourly limitation, compliance shall also be shown with the annual emission limitation..



j. Emission Limitation:

15.59 tons per year PM₁₀

Applicable Compliance Method:

The annual emission limitation was developed by multiplying the hourly allowable PM₁₀ emission limitation (3.56 lbs/hr) by the maximum annual hours of operation (8760 hrs), and then dividing by 2000 lbs/ton. Therefore, if compliance is shown with the hourly limitation, compliance shall also be shown with the annual emission limitation..

k. Emission Limitation:

2.76 tons per year of SO₂

Applicable Compliance Method:

Compliance with the annual SO₂ emission limitation shall be calculated using the following calculations and adding the three results together:

For the RFG calculation:

$ERG * H * (\text{actual annual flow rate of RFG}) * (1 \text{ ton}/2000 \text{ lbs}) = \text{TPY SO}_2 \text{ from RFG}$

ERG = the annual average SO₂ emission rate (lb SO₂/mmBtu) calculated using the 24-hour daily average values recorded in term d)(6)

H = the average annual heat content of the fuel (Btu/dscf) calculated using the values recorded in term d)(6).

Annual flow rate of RFG is from the values recorded in term d)(7) in mmscf/yr

For the natural gas calculation:

$0.6 * (\text{actual annual flow rate of NG}) * (1 \text{ ton}/2000 \text{ lbs}) = \text{TPY SO}_2 \text{ from NG}$

0.6 = natural gas combustion SO₂ emission factor (lb/mmscf) from AP-42, Section 1.4, Table 1.4-2 (7/98)

Annual flow rate of NG is from the values recorded in term d)(7) in mmscf/yr

For the PSA purge gas calculation:

$(\text{Conc H}_2\text{S}_{\text{PSA}} \text{ppmv H}_2\text{S}) * ((34.08 \text{ lb}/385,100,000 \text{ ft}^3)/1 \text{ ppmv}) * ((64 \text{ lb SO}_2/\text{lb-mole})/(34.08 \text{ lb H}_2\text{S}/\text{lb-mole})) * (1,000,000 \text{ scf}/1 \text{ mmscf}) * (\text{actual annual flow rate of PSA}) * (1 \text{ ton}/2000 \text{ lbs}) = \text{TPY SO}_2 \text{ from PSA purge gas}$

Conc H₂S_{PSA}ppmv H₂S = 0.20 as required by the limit in term c)(2) or the annual average measured values required per term d)(8)



MW H₂S=34.08 lb/lb-mole MW SO₂ = 64 lb/lb-mole

1 ppmv = MW/385,100,000 lb/ft³ from AP-42, Appendix A, Miscellaneous Data and Conversion Factors (9/85)

Annual flow rate of PSA is from the values recorded in term d)(7) (mmscf/yr)

I. Emission Limitation:

10 ppmv ammonia corrected to 15% oxygen in flue gas, on a dry basis and 11.39 TPY

Applicable Compliance Method:

If required, the permittee shall demonstrate compliance with the 10 ppmv ammonia emission limit using U.S. EPA Conditional Test Method (CTM) 027. Alternative U.S. EPA approved test methods may be used with prior approval from the Ohio EPA.

The annual emission limitation was based on the maximum stack gas flow rate of 175,000 acfm and the 10 ppmv. For example:

Ammonia TPY = (stack gas flow rate (cfm)) * (60 min/hr) * (24 hr/day) * (365 day/yr) * (10/1,000,000) * (17.03 lb NH₃/lb-mole) / (2000 lbs/ton) / (379.43 cf/lb-mole)

m. Emission Limitation:

0.10 grain H₂S per dry standard cubic foot (159 ppmv at 14.7 psia and 60 degrees F) of refinery fuel gas burned as a volume-weighted, 24 hour daily average

Applicable Compliance Method:

Compliance shall be demonstrated based upon the monitoring and record keeping requirements of d). If required, compliance shall also be demonstrated based upon the following methods: Method 11, 15, 15A, or 16 of 40 CFR Part 60, Appendix A, shall be used to determine the H₂S concentration. The gases entering the sampling train should be at about atmospheric pressure. If the pressure in the refinery fuel gas lines is relatively high, a flow control valve may be used to reduce the pressure. If the line pressure is high enough to operate the sampling train without a vacuum pump, the pump may be eliminated from the sampling train. The sample shall be drawn from a point near the centroid of the fuel gas line.

i. For Method 11, the sampling time and sample volume shall be at least 10 minutes and 0.010 dscm (0.35 dscf). Two samples of equal sampling times shall be taken at about 1-hour intervals. The arithmetic average of these two samples shall constitute a run. For most fuel gases, sampling times exceeding 20 minutes may result in depletion of the collection



solution, although fuel gases containing low concentrations of H₂S may necessitate sampling for longer periods of time.

- ii. For Method 15 or 16, at least three injects over a 1-hour period shall constitute a run.
- iii. For Method 15A, a 1-hour sample shall constitute a run.

n. Emission Limitation:

0.20 ppmv H₂S from the process PSA purge gas

Applicable Compliance Method:

Compliance shall be demonstrated based upon the analysis of the process PSA purge gas and the recordkeeping requirements of d).

(2) DEAERATOR VENT EMISSIONS:

a. Emission Limitation:

1.83 pounds per hour and 8.00 TPY CO

Applicable Compliance Method:

A one-time calculation of the hourly potential to emit, based upon the worst case operating scenario using a mass balance and the design of the unit, shall be used to demonstrate compliance with this limitation. The basis for the calculation used a flow rate of 128.37 lb-mole/hr from the vent, a molecular weight of 28 lb CO/lb-mole, and assumed the CO emissions were 461 ppm and then added 10% for flexibility. For emission limits were calculated as follows:

$$(461/1,000,000) * (128.37 \text{ lb-mole/hr}) * (28 \text{ lb CO/lb-mole}) * 1.10 = 1.83 \text{ lb/hr}$$

$$(1.83 \text{ lb/hr}) * (8760 \text{ hr/yr}) * (1 \text{ ton}/2000 \text{ lb}) = 8.00 \text{ TPY}$$

If required, the permittee shall demonstrate compliance with the hourly emission limitation using Methods 1 through 4 and 10 of 40 CFR Part 60, Appendix A. Alternative U.S. EPA approved test methods may be used with prior approval from Ohio EPA.

The annual emission limitation was developed by multiplying the hourly allowable CO emission limitation (1.83 lbs/hr) by the maximum annual hours of operation (8760 hrs), and then dividing by 2000 lbs/ton. Therefore, if compliance is shown with the hourly limitation, compliance shall also be shown with the annual emission limitation

b. Emission Limitation:

0.51 pound per hour and 2.22 TPY volatile organic compounds (VOC) as methanol



Applicable Compliance Method:

A one-time calculation of the hourly potential to emit, based upon the worst case operating scenario using a mass balance and the design of the unit, shall be used to demonstrate compliance with this limitation. The basis for the calculation used a flow rate of 128.37 lb-mole/hr from the vent, a molecular weight of 32 lb VOC/lb-mole, and assumed the VOC emissions were 112 ppm and then added 10% for flexibility. The emission limits were calculated as follows:

$$(112/1,000,000)*(128.37 \text{ lb-mole/hr})*(32 \text{ lb VOC/lb-mole}) * 1.10 = 0.51 \text{ lb/hr}$$

$$(0.51 \text{ lb/hr}) * (8760 \text{ hr/yr}) * (1 \text{ ton}/2000 \text{ lb}) = 2.22 \text{ TPY}$$

If required, the permittee shall demonstrate compliance with the hourly emission rate using Methods 1 through 4 of 40 CFR Part 60, Appendix A and Method 308 of 40 CFR Part 63, Appendix A. Alternative U.S. EPA-approved test methods can be used with prior approval from Ohio EPA.

The annual emission limitation was developed by multiplying the hourly allowable VOC emission limitation (0.51 lbs/hr) by the maximum annual hours of operation (8760 hrs), and then dividing by 2000 lbs/ton and, therefore, if compliance is shown with the hourly limitation, compliance shall also be shown with the annual emission limitation.

c. Emission Limitation:

0.34 pound per hour and 1.50 TPY ammonia

Applicable Compliance Method:

A one-time calculation of the hourly potential to emit, based upon the worst case operating scenario using a mass balance and the design of the unit, shall be used to demonstrate compliance with this limitation. The basis for the calculation used a flow rate of 128.37 lb-mole/hr from the vent, a molecular weight of 17 lb NH₃/lb-mole, and assumed the NH₃ emissions were 141 ppm and then added 10% for flexibility. The emission limits were calculated as follows:

$$(141/1,000,000)*(128.37 \text{ lb-mole/hr})*(17 \text{ lb NH}_3/\text{lb-mole}) * 1.10 = 0.34 \text{ lb/hr}$$

$$(0.34 \text{ lb/hr}) * (8760 \text{ hr/yr}) * (1 \text{ ton}/2000 \text{ lb}) = 1.50 \text{ TPY}$$

If required, the permittee shall demonstrate compliance with the hourly emission limitation using U.S. EPA Conditional Test Method (CTM) 027. Alternative U.S. EPA approved test methods may be used with prior approval from Ohio EPA.

The annual emission limitation was developed by multiplying the hourly allowable ammonia emission limitation (0.34 lbs/hr) by the maximum annual hours of operation (8760 hrs), and then dividing by 2000 lbs/ton. Therefore, if compliance is shown with the hourly limitation, compliance shall also be shown with the annual emission limitation.



Final Permit-to-Install and Operate
LINDE GAS NORTH AMERICA, LLC
Permit Number: P0117759
Facility ID: 0448020085
Effective Date: 10/29/2014

(3) Emission testing requirements:

- a. Ongoing compliance with the NOx emissions limitations contained in this permit, 40 CFR Part 60, and any other applicable standard(s) shall be demonstrated through the data collected as required in the Monitoring and Record keeping Section of this permit; and through demonstration of compliance with the quality assurance/quality control plan, which shall meet the testing and recertification requirements of 40 CFR Part 60.

g) Miscellaneous Requirements

- (1) None.