Air Quality Permit Application for Permit to Construct

Permit: O10001

Norse Gas Plant

Divide County, North Dakota

October 2024

PREPARED FOR:

Hiland Partners Holdings LLC

Divide County, North Dakota

SPIRIT PROJECT: 24299.00A

FOR SPIRIT ENVIRONMENTAL:

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1.0 Introduction

Hiland Partners Holding, LLC (Hiland) is submitting this permit modification application for the Norse Gas Plant (Operating Permit O10001), a natural gas processing plant located in Divide County, North Dakota. The Norse Gas Plant extracts gas liquids from the field gas. The natural gas liquids (NGL) are stored in tanks and removed from the facility by tank trucks. The residue gas is compressed and exits the facility by pipeline.

1.1 Proposed Modification

This permit request is for the construction of a new inlet compressor engine and installation of associated fugitive components. Emissions from the proposed changes can be found in Attachment A. Equipment specifications can be found in Attachment B

1.2 Application

In accordance with North Dakota Division of Air Quality requirements, permit application forms have been completed and are included in Section 5.0.

1.3 Public Notice

Per North Dakota Administrative Code (NDAC) Section 33.1-15-14-02.6 – Public participation – Final action on application, this facility does qualify as a source category not subject to public participation procedures. The following discussion substantiates this claim:

NDAC Section 33.1-15-14-02-6.a(1)

This facility is not an affected facility per 40 CFR 61 – National Emission Standards For Hazardous Air Pollutants (NESHAP) as incorporated by NDAC Chapter 33.1-15-13. Hazardous Air Pollutant (HAP) emission calculations indicate that potential HAP emissions at the Norse Gas Plant will not exceed the major source thresholds of 10 tons per year (tpy) of any individual HAP or 25 tpy of any combination of HAPs.

NDAC Section 33.1-15-14-02-6.a(2)

The gas plant operates under Permit to Operate O10001 and will remain a synthetic minor source after the proposed changes. The site is not a new source required to obtain a Titel V permit to operate under section 33.1-15-14-06.

NDAC Section 33.1-15-14-02-6.a(3)

The potential to emit (PTE) will not increase by more than 100 tpy of any criteria pollutant, 10 tpy or more of any individual HAP or 25 tpy or more of any combination of HAPs (NDAC 33.1-15-14-02.01a(3)).

NDAC Section 33.1-15-14-02-6.a(4)

Potential emissions as reported in Appendix A are not expected to have a "major impact on air quality."

NDAC Section 33.1-15-14-02-6.a(5) & (6)

As of the application date, no request for a public comment period has been received and it is anticipated that this project will not generate a significant degree of public interest.

NDAC Section 33.1-15-14-02-6.a(7)

For this project, Hiland is not requesting in this application federally enforceable permit conditions that limit their potential to emit (synthetic minor permit).

1.4 Site Location

The Norse Gas Plant is located approximately seven (7) miles north of McGregor in the SE ¼, SW ¼ of Section 11, Township 160 North, Range 95 West, in Divide County, North Dakota. The general UTM coordinates are Zone 13, Easting: 652,940 meters, and Northing: 5,395,351 meters. The site elevation is approximately 2,343 feet above sea level. A map of the facility location can be found in Figure 1-1. A plot plan of the facility location can be found in Figure 1-2.

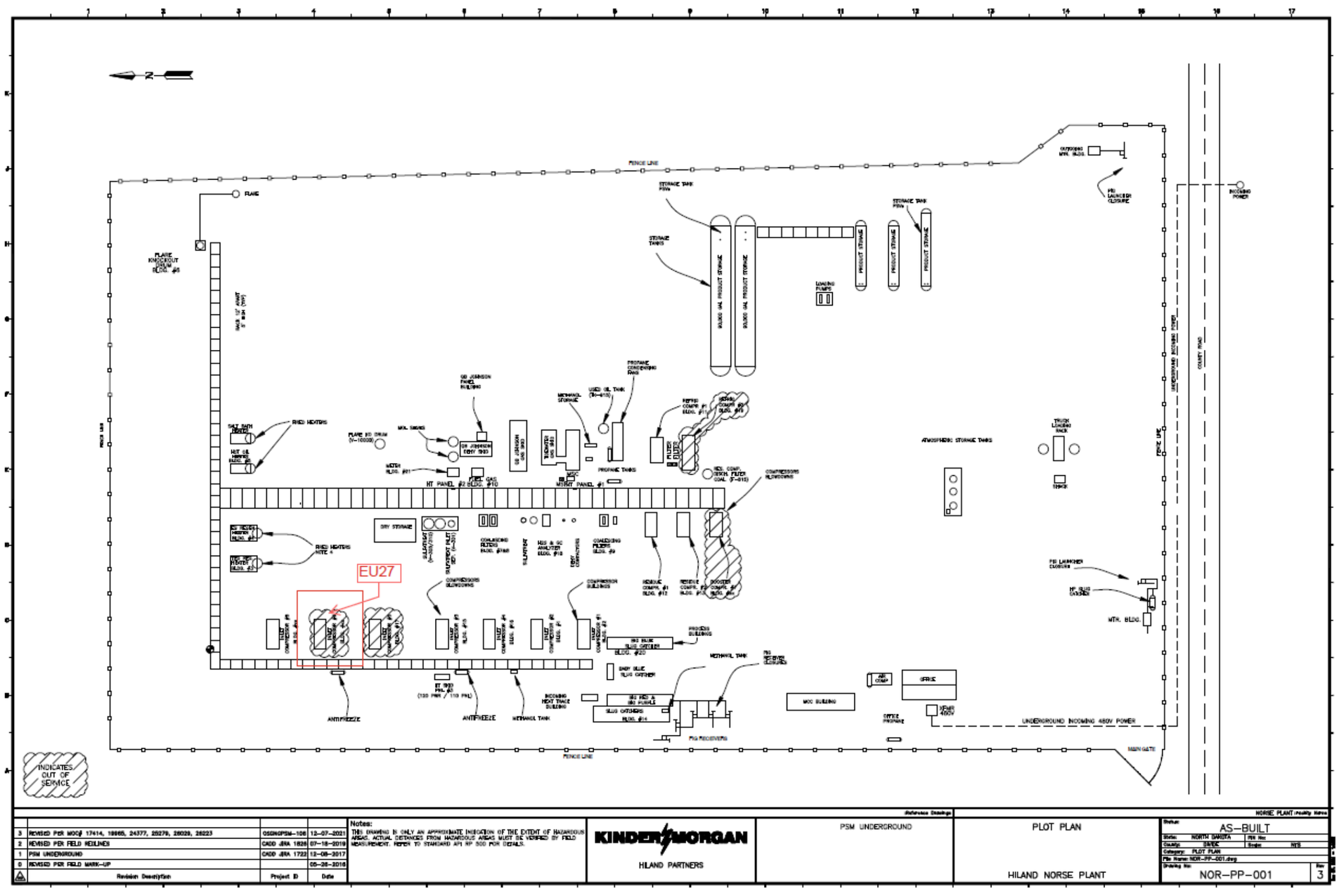
1.5 Site Description

The terrain surrounding the facility is characterized as flat to slightly rolling hills. The surrounding area is mainly used for agriculture and livestock grazing. The air quality classification for the area is “Better than National Standards” or unclassifiable/attainment for the National Ambient Air

Quality Standards for criteria pollutants [40 Code of Federal Regulations (CFR) 81.335]. There are no non-attainment areas within a reasonable distance of the site.

Figure 1-1 Norse Gas Plant Area Map

Figure 1-2 Norse Gas Plant Facility Layout



3	REVISED PER MOC# 17414, 19985, 24377, 25279, 28029, 28223	OSGNOPSM-106	12-07-2021
2	REVISED PER FIELD REDLINES	CADD dRA 1826	07-18-2019
1	PSM UNDERGROUND	CADD dRA 1722	12-08-2017
0	REVISED PER FIELD MARK-UP		05-26-2016
	Revision Description	Project ID	Date

Notes:
THIS DRAWING IS ONLY AN APPROXIMATE INDICATION OF THE EXTENT OF HAZARDOUS AREAS. ACTUAL DISTANCES FROM HAZARDOUS AREAS MUST BE VERIFIED BY FIELD MEASUREMENT. REFER TO STANDARD API RP 500 FOR DETAILS.

KINDER MORGAN
HILAND PARTNERS

PSM UNDERGROUND

PLOT PLAN
HILAND NORSE PLANT

Status: AS-BUILT
State: NORTH DAKOTA
County: DUNN
Category: PLOT PLAN
File Name: NOR-PP-001.dwg
Drawing No: NOR-PP-001
Rev: 3

2.0 Process Description

The Norse Gas Plant extracts gas liquids from the field gas. The NGL are stored in tanks and removed from the facility by tank trucks. The residue gas is compressed and exits the facility by pipeline

Emission sources currently at the plant include the following:

- Nine (9) natural gas-fired compressor engines;
- Four (4) natural-gas fired heaters;
- One (1) triethylene glycol (TEG) dehydration units used to dehydrate low pressure inlet gas, stabilizer overhead gas, and regeneration gas for mol sieves;
- One (1) emergency flare;
- Three (3) atmospheric tanks for storing water and condensate liquids knocked out of the process;
- Three (3) miscellaneous atmospheric tanks for storing methanol;
- Truck loading rack for NGL and produced water; and
- Piping components, including meters, connectors, valves, flanges, etc.

Emission sources proposed to be added to the plant, as outlined in Section 1.0, include the following

- One (1) natural gas fired inlet compressor engine [Emission Unit (EU) 27].

3.0 Emission Estimates

Air pollutants emitted from the Norse Gas Plant are as follows: NOx, PM, PM_{10}, $PM_{2.5}$, SO_2, VOCs, CO, and various HAPs.

This application contains PTE calculations for the proposed inlet compressor engine (EU27) and associated fugitive emissions.

The proposed engine (EU27) calculations of NO_X, CO, and VOC potential emissions are based on permit limitations; the emission factors used are higher than the ones provided by the manufacturer. Therefore, this project is not requesting a federally enforceable permit condition that limits this engine's potential to emit. Formaldehyde potential emissions from the proposed engine (EU27) are based on manufacturer data. Calculations of PM, PM_{10}, $PM_{2.5}$, SO_2, and HAP potential emissions are based on emission factors in AP-42 , Fifth Edition, Volume I, Chapter 3: Stationary Internal Combustion Sources, Section 3.2 Natural Gas Fired Reciprocating Engines Table 3.2-3. October 2024.

Potential emissions from proposed fugitive components are based on estimated component counts at the facility, stream analyses, and emission factors for oil and gas production facilities from Environmental Protection Agency (EPA)'s "Protocol for Equipment Leak Emission Estimates," November 1995 EPA 4531, R-95-017, Table 2-4.

Emission calculations for the proposed changes can be found in Attachment A. The proposed facility-wide emissions summary can be found in Table 3-1.

Table 3-1 Emissions Summary

Emission Unit	Emission Unit Description[3]	PM (tpy)	SO_2 (tpy)	NOx (tpy)	CO (tpy)	VOC (tpy)	CO_2e (tpy)	Formaldehyde (tpy)	HAP (tpy)
1	Inlet Compressor #1 - Waukesha L5794GSI	0.88	0.03	6.66	9.99	13.46	5,274.13	0.13	0.40
3	TEG Still Vent	--	--	--	--	2.13	--	--	0.50
4	Glycol Reboiler - 0.75 MMBtu/hr	0.01	1.93E-03	0.32	0.27	0.02	--	--	--
7	Condensate Tank #1 (West)	--	--	--	--	1.00	--	--	--
8	Condensate Tank #2 (Middle)	--	--	--	--	1.00	--	--	--
9	Emergency Flare	0.18	0	6.60	13.17	10.71	--	--	--
10	Refrigeration #1 - Waukesha 7044GSI	1.11	0.03	8.11	12.17	0.49	6,630.14	0.16	0.50
11	Residue Compressor #1 - Ajax DPC-2801LE	0.32	3.86E-03	3.94	6.57	2.78	762.13	0.56	0.56
13	Hot Oil Heater - 1.5 MMBtu/hr	0.01	3.86E-03	0.64	0.54	0.04	--	--	--
14	EG Heat Transfer/Regen Heater 1.63 MMBtu/hr	0.01	4.20E-03	0.70	0.59	0.04	--	--	--
15	Inlet Compressor #3 - Ajax DPC-720 LE	1.19	0.01	13.91	6.95	9.73	2,857.98	2.09	2.37
19	Salt Bath Heater - 6.0 MMBtu/hr	0.05	0.02	2.58	2.16	0.14	--	--	--
21	Residue Compressor #3 - Waukesha 5790G	0.53	0.02	4.07	8.13	0.24	3,177.28	0.08	0.24
23	Inlet Compressor #2 - Waukesha L5794GSI	0.88	0.03	8.66	8.66	9.57	5,289.58	0.24	0.51
24	Inlet Compressor #4 - Waukesha L7042GSI	0.78	0.02	11.91	11.91	4.19	4,679.69	0.61	1.91
25	Condensate Tank #3 (East)	--	--	--	--	1.00	--	--	--
26	Inlet Compressor #7 - Waukesha L5794GSI	0.88	0.03	8.66	8.66	9.35	5,289.58	0.03	0.30
27	Inlet Compressor #6 - Waukesha L7044GSI	1.33	0.04	16.51	10.09	11.94	7,979.90	0.02	0.43
NA	Produced Water Truck Loading	--	--	--	--	0.66	--	--	--
NA	Pigging[1]	--	--	--	--	1.00	--	--	--
NA	Compressor Blowdowns	--	--	--	--	2.20	--	--	0.03
NA	Fugitive Emissions	--	--	--	--	7.66	--	--	0.14
NA	NGL Truck Loading	--	--	--	--	0.82	--	--	--
NA	Methanol Chemical Storage Tank[2]	--	--	--	--	0.01	--	--	0.01
NA	Methanol Chemical Storage Tank[2]	--	--	--	--	0.01	--	--	0.01
NA	Discharge Methanol Storage Tank[2]	--	--	--	--	0.01	--	--	0.01
Total Sitewide Emissions:		**8.17**	**0.24**	**93.27**	**99.87**	**90.20**	**41,940.41**	**3.92**	**7.92**
Project Increases:		**1.33**	**0.04**	**16.51**	**10.09**	**12.63**	**7,979.90**	**0.02**	**0.44**
Emissions Title V Thresholds?		Yes	Yes	Yes	Yes	Yes	N/A	Yes	Yes

Notes:

1. Pigging emissions are conservatively assumed to be 1.00 tpy of VOC.

2. Methanol storage tank emissions are conservatively assumed to be 0.01 tpy of VOC.

3. Minor sources are considered Produced Water Truck Loading, Pigging, Compressor Blowdowns, Fugitives, NGL Truck Loading, and Methanol Storage Tanks.

4.0 Regulatory Applicability

There are numerous federal and North Dakota regulations and requirements applicable to the Norse Gas Plant. These requirements were addressed in previous operating permit applications; therefore, are not included in this application. Please refer to these applications for the detailed federal regulatory applicability analyses for the Norse Gas Plant. This section includes a discussion of applicable regulations specifically in regard to the Norse Gas Plant's proposed changes.

4.1 Federal Regulatory Requirements

This section includes a discussion of applicable federal regulations specifically regarding the Norse Gas Plant's proposed changes.

4.1.1 40 CFR 60, Subpart A – General Provisions

Sources at the Norse Gas Plant are subject to subparts in 40 CFR 60; therefore, Hiland will comply with the applicable requirements of this subpart.

4.1.2 40 CFR 60, Subpart JJJJ – Standards for Stationary Spark Ignition Internal Combustion Engines

Owners and operators are subject to 40 CFR 60 Subpart JJJJ if construction, reconstruction, or modification of the spark ignition internal combustion engine (SI ICE) commenced after June 12, 2006, and if manufactured

- On or after July 1, 2007, for engines with a maximum engine power greater than or equal to 500 hp (except lean-burn engines with a maximum engine power greater than or equal to 500 hp and less than 1,350 hp);
- On or after January 1, 2008, for lean-burn engines with a maximum engine power greater than or equal to 500 hp and less than 1,350 hp;
- On or after July 1, 2008, for engines with a maximum engine power less than 500 hp; or
- On or after January 1, 2009, for emergency engines with a maximum engine power greater than 19 KW (25 hp).

The new compressor engine (EU27) was manufactured after July 1, 2007; therefore, Subpart JJJJ is applicable and Hiland will comply with applicable requirements.

4.1.3 40 CFR 60, Subpart OOOO – Standards of Performance for Crude Oil and Natural Gas Facilities for Which Construction, Modification, or Reconstruction Commenced After August 23, 2011, and on or Before September 18, 2015

Owners and operators are subject to Subpart OOOO if they commence construction, modification or reconstruction of an affected facility after August 23, 2011 and on or before September 18, 2015. For a natural gas processing plant, affected facilities include centrifugal compressors, reciprocating compressors, storage vessels, sweetening units, and equipment leaks.

The proposed changes to this site will not affect the current applicability of Subpart OOOO for this site.

4.1.4 40 CFR 60, Subpart OOOOa – Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification, or Reconstruction Commenced after September 18, 2015

Owners and operators are subject to Subpart OOOOa if they commence construction, modification or reconstruction of an affected facility after September 18, 2015. For a natural gas processing plant, affected facilities include centrifugal compressors, reciprocating compressors, storage vessels, pneumatic controllers, sweetening units, and equipment leaks.

The proposed compressor currently exists at another site. Per 40 CFR 60.14(e)(6), the relocation of an existing facility is not considered a modification. However, the proposed compressor is currently subject to Subpart OOOOa; therefore, the proposed compressor will continue to comply with the requirements of this subpart at the Norse Gas Plant. Other unaffected sources already subject to this subpart will continue to comply with the requirements of this subpart.

4.1.5 40 CFR 60, Subpart OOOOb – Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification, or Reconstruction Commenced after December 6, 2022

Owners and operators are subject to Subpart OOOOb if they commence construction, modification or reconstruction of an affected facility after December 6, 2022. For a natural gas

processing plant, affected facilities include centrifugal compressors, reciprocating compressors, storage vessels, pneumatic controllers, sweetening units, pumps, and equipment leaks.

The relocation of proposed compressor is not considered a construction, modification, or reconstruction; therefore, the requirements of this subpart do not apply.

4.1.6 40 CFR 63, Subpart A – General Provisions

Sources at the Norse Gas Plant are subject to subparts in 40 CFR 63; therefore, Hiland will comply with the applicable requirements of this subpart.

4.1.7 40 CFR 63, Subpart ZZZZ – National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

This regulation applies to any reciprocating internal combustion engine (RICE) located at a major or area source of HAP emissions. Compressor engine EU1 was manufactured after July 1, 2007, and the Norse Gas Plant is an area HAP source; therefore, engine (EU27) must meet the requirements in Maximum Achievable Control Technology (MACT) Subpart ZZZZ by meeting the requirements in NSPS Subpart JJJJ.

4.2 North Dakota Regulatory Requirements

This section includes a discussion of applicable state regulations specifically regarding the Norse Gas Plant's proposed changes.

4.2.1 NDAC 33.1-15-01 - General Provisions

This facility is subject to all general requirements of this section (i.e., inspection, circumvention, shutdown/malfunction, compliance, enforcement, confidentiality of records, etc.).

4.2.2 NDAC 33.1-15-02 - Ambient Air Quality Standards

The air quality of the area is classified as "Better than National Standards" or unclassifiable/attainment of the National Ambient Air Quality Standards (NAAQS) for criteria pollutants (40 CFR 81.335). There are no nonattainment areas within a reasonable distance of the site. The emission units included in this application are located at a facility that is subject to

ambient air quality standards; therefore, Hiland will abide by all standards set forth in this regulation.

4.2.3 NDAC 33.1-15-03 - Restriction of Emission of Visible Air Contaminants

NDAC 33.1-15-03 contains regulations governing particulate matter and opacity limits from new and existing sources. The proposed engine (EU27) is subject to 33.1-15-03-02 relating to restrictions applicable to new installations which states: No person may discharge into the ambient air from any single source of emission whatsoever any air contaminant which exhibits an opacity greater than twenty percent except that a maximum of forty percent opacity is permissible for not more than one (1) six-minute period per hour. The engine will meet the requirements of this regulation.

4.2.4 NDAC 33.1-15-04 – Open Burning Restrictions

Hiland will not perform open burning of refuse, trade waste, or other combustible material except as provided for in Section 33.1-15-04-02 or 33.1-15-10-02, and will not conduct, cause, or permit the conduct of a salvage operation by open burning.

4.2.5 NDAC 33.1-15-05 - Emissions of Particulate Matter Restricted

The proposed natural gas-fired stationary combustion engine (EU27) will comply with the provisions of Sections 33.1-15-05-01 and 33.1-15-05-04. The engine combusts fuel that generates particulate matter; therefore, are subject to allowable rate limitations that no person shall cause, suffer, allow, or permit the emission of particulate matter in any one (1) hour from any source in excess of the amount shown in 33.1-15-05-01(2)(b) Table 3: Maximum Allowable Rates of Emission of Particulate Matter from Industrial Processes.

4.2.6 NDAC 33.1-15-06 - Emissions of Sulfur Compounds Restricted

The proposed engine (EU27) combusts pipeline quality natural gas. Pper Section 33-15-06-01, is not subject to the regulations of this section.

4.2.7 NDAC 33.1-15-07 - Control of Organic Compounds Emissions

The proposed compressor (EU27) will be equipped and will operate with properly maintained seals designed for its specific product service and operating conditions.

4.2.8 NDAC 33.1-15-08 - Control of Air Pollution from Vehicles and Other Internal Combustion Engines

The proposed engine (EU27) is a natural gas-fired internal combustion engine and will comply with the restricted emissions regulation of Section 33.1-15-08-01.

4.2.9 NDAC 33.1-15-10 - Control of Pesticides

Hiland will comply with the provisions of NDAC 33.1-15-10 should pesticides be used at this facility.

4.2.10 NDAC 33.1-15-11 – Prevention of Air Pollution Emergency Episodes

Hiland will comply with any applicable source curtailment regulations when notified by the Department of an Air Pollution Emergency Episode.

4.2.11 NDAC 33.1-15-12 - Standards of Performance for New Stationary Sources

The applicability of New Source Performance Standards (NSPS) is discussed in Section 4.1.

4.2.12 NDAC 33.1-15-13 – Emission Standards for Hazardous Air Pollutants

This proposed facility is not an affected facility per 40 CFR 61 – NESHAP as incorporated by NDAC Chapter 33.1-15-13. HAP emission calculations indicate that potential HAP emissions at the Norse Gas Plant will not exceed the major source thresholds of 10 tpy any individual HAP or 25 tpy of any combination of HAPs.

4.2.13 NDAC 33.1-15-14 - Designated Air Contaminant Sources, Permit to Construct, Minor Source Permit to Operate, Title V Permit to Operate

Hiland is submitting this application per the Permit to Construct requirements of this section to request construction authorization for the proposed engine and associated fugitive component installation. The facility is subject to the minor source operating permit program per NDAC 33.1-15-14-03, and currently operates under Permit to Operate O10001.

4.2.14 NDAC 33.1-15-15 - Prevention of Significant Deterioration of Air Quality

PSD permitting regulations apply to major stationary sources. A major stationary source is defined as a listed facility with the potential to emit 100 tpy or more of any regulated pollutant or a non-listed facility with the potential to emit 250 tpy or more of any regulated pollutant and the potential to emit 100,000 tpy of carbon dioxide equivalents (CO_2e). Since the Norse Gas Plant is not a listed facility, does not have the potential to emit greater than 250 tpy of any regulated pollutant or 100,000 tpy of CO_2e, PSD is not applicable.

In addition, the changes in potential emissions from the existing facility do not exceed the thresholds listed in the Criteria Pollutant Modeling Requirements for a Permit to Construct memorandum; therefore, modeling is not required for this project.

4.2.15 NDAC 33.1-15-16 - Restriction of Odorous Air Contaminants

Hiland will comply with all requirements concerning odorous air contaminants at the Norse Gas Plant as applicable to sources outside a city or outside the area over which a city has exercised extraterritorial zoning as defined in North Dakota Century Code Section 40-47-01.1.

4.2.16 NDAC 33.1-15-17- Restriction of Fugitive Emissions

Hiland will comply with all requirements by taking reasonable precautions to prevent fugitive emissions causing air pollution as defined in NDAC 33.1-15-01-04. Hiland will comply with the fugitive emissions standards in 40 CFR 60 Subpart OOOO and OOOOa as applicable.

4.2.17 NDAC 33.1-15-18 - Stack Heights

Hiland will utilize good engineering practices relating to the installation of proposed engine EU27. Emissions from EU27 are vented from a stack height greater than or equal to 1.5 times the nearest building height.

4.2.18 NDAC 33.1-15-22- Emissions Standards for Hazardous Air Pollutants

The applicability of 40 CFR 63 – MACT for Source Categories is discussed in Section 4.1.

4.2.19 Policy for the Control of Hazardous Air Pollutant Emissions in North Dakota (Air Toxics Policy)

Proposed engine EU27 is a listed source in NDAC 33.1-15-14-01. Therefore, per the applicability section of the North Dakota Air Toxics Policy, this engine is subject to these regulations. The Dispersion Modeling Requirements, Compressor Engines and Glycol Dehydration Memorandum was rescinded on December 18, 2023.

5.0 ND DEQ Forms

The following forms are included in this application:

- FORM 8516 - Permit Application for Air Contaminant Sources
- FORM 8891 - Permit Application for Internal Combustion Engines and Turbines
- FORM 8532 - Permit Application for Air Pollution Control Equipment (EU27)
- FORM 8329 - Permit Application for Hazardous Air Pollutant (HAP) Sources (EU27)

PERMIT APPLICATION FOR AIR CONTAMINANT SOURCES

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR QUALITY
SFN 8516 (9-2021)

SECTION A - FACILITY INFORMATION

Name of Firm or Organization Hiland Partners Holdings LLC		
Applicant's Name Alex Schmidt		
Title Director of Operations	Telephone Number (701) 833-6426	E-mail Address alex_schmidt@kindermorgan.com
Contact Person for Air Pollution Matters Jason Burow		
Title EHS Engineer	Telephone Number (713) 420-2813	E-mail Address jason_burow@kindermorgan.com
Mailing Address (Street & No.) 1001 Louisiana Street, Suite 1000		
City Houston	State TX	ZIP Code 77002
Facility Name Norse Gas Plant		
Facility Address (Street & No.) 10370 88th Street		
City McGregor	State ND	ZIP Code 58755

County Divide	Coordinates NAD 83 in Decimal Degrees (to forth decimal degree)	
	Latitude 48.69244200	Longitude -102.92172200

Legal Description of Facility Site

Quarter	Quarter	Section	Township	Range
SE	SW	11	160N	95W

Land Area at Facility Site 12 Acres (or) _____ Sq. Ft.	MSL Elevation at Facility 2,343 ft.

SECTION B – GENERAL NATURE OF BUSINESS

Describe Nature of Business	North American Industry Classification System Number	Standard Industrial Classification Number (SIC)
Gas Plant	211112	1312

SECTION C – GENERAL PERMIT INFORMATION

Type of Permit? ☒ Permit to Construct (PTC) ☐ Permit to Operate (PTO)

If application is for a Permit to Construct, please provide the following data:

Planned Start Construction Date TBD	Planned End Construction Date 05/2025

SECTION D – SOURCE IDENTIFICATION AND CATEGORY OF EACH SOURCE INCLUDED ON THIS PERMIT APPLICATION

		Permit to Construct				Minor Source Permit to Operate						
Your Source ID Number	Source or Unit (Equipment, Machines, Devices, Boilers, Processes, Incinerators, Etc.)	New Source	Existing Source Modification	Existing Source Expansion	Existing Source Change of Location	New Source	Existing Source Initial Application	Existing Source After Modification	Existing Source After Expansion	Existing Source After Change of Location	Existing Source After Change of Ownership	Other
27	Compressor Engine	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
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		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Add additional pages if necessary

SECTION D2 – APPLICABLE REGULATIONS

Source ID No.	Applicable Regulations (NSPS/MACT/NESHAP/etc.)
Facility-wide	NSPS OOOO, OOOOa - Fugitives
27	NSPS OOOOa - Reciprocating Compressor
27	NSPS JJJJ - Compressor Engine
27	MACT ZZZZ - Compressor Engine

SECTION E – TOTAL POTENTIAL EMISSIONS

Pollutant	Amount (Tons Per Year)
NO_x	93.27
CO	99.87
PM	8.17

Pollutant	Amount (Tons Per Year)
PM_{10} (filterable and condensable)	8.17
$PM_{2.5}$ (filterable and condensable)	8.17
SO_2	0.24
VOC	90.20
GHG (as CO_2e)	41,940.41
Largest Single HAP	3.92
Total HAPS	7.92

*If performance test results are available for the unit, submit a copy of test with this application. If manufacturer guarantee is used provide spec sheet.

SECTION F1 – ADDITIONAL FORMS

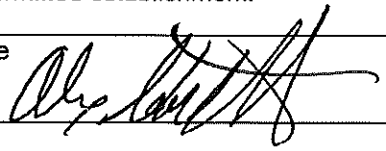
Indicate which of the following forms are attached and made part of the application

- ■ Air Pollution Control Equipment (SFN 8532)
- ☐ Construct/Operate Incinerators (SFN 8522)
- ☐ Natural Gas Processing Plants (SFN 11408)
- ☐ Glycol Dehydration Units (SFN 58923)
- ☐ Flares (SFN 59652)
- ☐ Grain, Feed, and Fertilizer Operations (SFN 8524)
- ☐ Fuel Burning Equipment Used for Indirect Heating (SFN 8518)
- ■ Hazardous Air Pollutant (HAP) Sources (SFN 8329)
- ☐ Manufacturing or Processing Equipment (SFN 8520)
- ☐ Volatile Organic Compounds Storage Tank (SFN 8535)
- ■ Internal Combustion Engines and Turbines (SFN 8891)
- ☐ Oil/Gas Production Facility Registration (SFN 14334)

SECTION F2 – OTHER ATTACHMENTS INCLUDED AS PART OF THIS APPLICATION

1.	Application Report	4.	
2.	Emission Calculations	5.	
3.	Engine Spec Sheet	6.	

I, the undersigned applicant, am fully aware that statements made in this application and the attached exhibits and statements constitute the application for Permit(s) to Construct and/or Operate Air Contaminant sources from the North Dakota Department of Environmental Quality and certify that the information in this application is true, correct and complete to the best of my knowledge and belief. Further, I agree to comply with the provisions of Chapter 23.1-06 of the North Dakota Century Code and all rules and regulations of the Department, or revisions thereof. I also understand the permit is nontransferable and, if granted a permit, I will promptly notify the Department upon sale or legal transfer of this permitted establishment.

Signature	Date
	10/25/24

INSTRUCTIONS

SITE PLANS TO BE ATTACHED TO APPLICATION:

Prepare and attach a plot plan drawn to scale or properly dimensioned, showing at least the following:

a. The property involved and the outlines and heights of all buildings on the property. Identify property lines plainly. Also, indicate if there is a fence around the property that prevents public access.

b. Location and identification of all existing or proposed equipment, manufacturing processes, etc., and points of emission or discharge of air contaminants to the atmosphere.

c. Location of the facility or property with respect to the surrounding area, including residences, businesses and other permanent structures, streets and roadways. Identify all such structures and roadways. Indicate direction (**NORTH**) on the drawing and the prevailing wind direction.

EQUIPMENT PLANS AND SPECIFICATIONS FOR PERMIT TO CONSTRUCT:

Supply plans and specifications, including as a minimum an assembly drawing, dimensioned and to scale, in plan, elevation and as many sections as are needed to show clearly the design and operation of the equipment and the means by which air contaminants are controlled.

The following must be shown:

a. Size and shape of the equipment. Show exterior and interior dimensions and features.

b. Locations, sizes, and shape details of all features which may affect the production, collection, conveying, or control of air contaminants of any kind, location, size, and shape details concerning all material handling equipment.

c. All data and calculations used in selecting or designing the equipment.

d. Horsepower rating of all internal combustion engines driving the equipment.

NOTE: **STRUCTURAL DESIGN CALCULATIONS AND DETAILS ARE NOT REQUIRED.** WHEN STANDARD COMMERCIAL EQUIPMENT IS TO BE INSTALLED, THE MANUFACTURER'S CATALOG DESCRIBING THE EQUIPMENT MAY BE SUBMITTED IN LIEU OF ITEMS a, b, c, and d OF ABOVE, WHICH THE CATALOG COVERS. ALL INFORMATION REQUIRED ABOVE THAT THE CATALOG DOES NOT CONTAIN MUST BE SUBMITTED BY THE APPLICANT.

ADDITIONAL INFORMATION MAY BE REQUIRED:

If the application is signed by an authorized representative of the owner, a LETTER OF AUTHORIZATION must be attached to the application.

SEND COMPLETED APPLICATION AND ALL ATTACHMENTS TO:

North Dakota Department of Environmental Quality
Division of Air Quality
4201 Normandy Street, 2nd Floor
Bismarck, ND 58503-1324
(701) 328-5188

PERMIT APPLICATION FOR INTERNAL COMBUSTION ENGINES AND TURBINES

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR QUALITY
SFN 8891 (9-2021)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.
- Must include SFN 8516 or SFN 52858

SECTION A – GENERAL INFORMATION

Name of Firm or Organization	Facility Name
Hiland Partners Holdings LLC	Norse Gas Plant

SECTION B – FACILITY AND UNIT INFORMATION

Source ID Number (From form SFN 8516)
27

Type of Unit (check all that apply)		
	☒ Stationary Natural Gas-Fired Engine	☐ Emergency Use Only
	☐ Stationary Diesel and Dual Fuel Engine	☒ Non-Emergency Use
	☐ Stationary Gasoline Engine	☐ Peaking
	☐ Stationary Natural Gas-Fired Turbine	☐ Demand Response
	☐ Other – Specify:	

SECTION C – MANUFACTURER DATA

Make	Model	Date of Manufacture
Waukesha	L7044 GSI	11/01/2019

Reciprocating Internal Combustion Engine

☒ Spark Ignition ☐ Compression Ignition ☐ Lean Burn
☒ 4 Stroke ☐ 2 Stroke ☒ Rich Burn

Maximum Rating (BHP @ rpm)	Operating Capacity (BHP @ rpm)
1900 @ 1200 rpm	1900 @ 1200 rpm

Engine Subject to:
- ☐ 40 CFR 60, Subpart IIII
- ☒ 40 CFR 60, Subpart JJJJ
- ☒ 40 CFR 63, Subpart ZZZZ
- ☐ 40 CFR 60, Subpart OOOO (for compressors)
- ☒ 40 CFR 60, Subpart OOOOa (for compressors)

Turbine
Dry Low Emissions? ☐ Yes ☐ No

Heat Input (MMBtu/hr)	Maximum Rating (HP)	75% Rating (HP)	Efficiency

Turbine Subject to:
☐ 40 CFR 60, Subpart GG ☐ 40 CFR 60, Subpart KKKK

SECTION D – FUELS USED

Natural Gas (10^6 cu ft/year)	Percent Sulfur	Percent H_2S
91.58	Negligible	Negligible
Oil (gal/year)	Percent Sulfur	Grade No.
LP Gas (gal/year)	Other – Specify:	

SECTION E – NORMAL OPERATING SCHEDULE

Hours Per Day	Days Per Week	Weeks Per Year	Hours Per Year	Peak Production Season (if any)
24	7	52	8760	

SECTION F – STACK PARAMETERS

Emission Point ID Number		Stack Height Above Ground Level (feet)	
27		1.5 x Building Height (approximately 35 ft)	
Stack Diameter (feet at top)	Gas Discharged (SCFM)	Exit Temp (°F)	Gas Velocity (FPS)
12 inches	8683	1,140	184.3

SECTION G – EMISSION CONTROL EQUIPMENT

Is any emission control equipment installed on this unit?

☐ No ■ Yes – Complete and attach form SFN 8532

SECTION H – MAXIMUM AIR CONTAMINANTS EMITTED

Pollutant	Maximum Pounds Per Hour	Amount (Tons Per Year)	Basis of Estimate*
NO_x	3.77	16.51	Vendor Data/Permit Limit
CO	2.30	10.09	Vendor Data/Permit Limit
PM	0.30	1.33	AP-42 Table 3.2-3
PM_{10} (filterable and condensable)	0.30	1.33	AP-42 Table 3.2-3
$PM_{2.5}$ (filterable and condensable)	0.30	1.33	AP-42 Table 3.2-3
SO_2	0.01	0.04	AP-42 Table 3.2-3
VOC	2.73	11.94	Permit Limit
GHG (as CO_2e)	1,822	7,980	AP-42 Table 3.2-3
Largest Single HAP	0.02	0.11	AP-42 Table 3.2-3
Total HAPS	0.10	0.43	Vendor Data/AP-42

* If performance test results are available for the unit, submit a copy of test with this application, if manufacture data used, submit manufacturers specification sheets.

IS THIS UNIT IN COMPLIANCE WITH ALL APPLICABLE AIR POLLUTION RULES AND REGULATIONS?

■ YES ☐ NO

If "NO" a Compliance Schedule (SFN 61008) must be completed and attached.

Attach and label separate sheet(s) if you need more space to explain any system or answers or to provide complete listings of Emissions, Contaminants, or other items.

SEND COMPLETED APPLICATION AND ALL ATTACHMENTS TO:

North Dakota Department of Environmental Quality
Division of Air Quality
4201 Normandy Street, 2nd Floor
Bismarck, ND 58503-1324
(701) 328-5188

PERMIT APPLICATION FOR AIR POLLUTION CONTROL EQUIPMENT

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR QUALITY
SFN 8532 (9-2021)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.
- Must also include forms SFN 8516 or SFN 52858

SECTION A – GENERAL INFORMATION

Name of Firm or Organization	Facility Name
Hiland Partners Holdings LLC	Norse Gas Plant

Source ID No. of Equipment being Controlled
27

SECTION B – EQUIPMENT

Type: ☐ Cyclone ☐ Multiclone ☐ Baghouse ☐ Electrostatic Precipitator
☐ Wet Scrubber ☐ Spray Dryer ☐ Flare/Combustor
☒ Other – Specify: NSCR

Name of Manufacturer	Model Number	Date to Be Installed
Waukesha	L7044 GSI	2025

Application:
☐ Boiler ☐ Kiln ☒ Engine ☐ Other – Specify:

Pollutants Removed	NOx	CO	VOC	
Design Efficiency (%)	92.4%	90.7%	20%	
Operating Efficiency (%)	TBD	TBD	TBD	

Describe method used to determine operating efficiency:

SECTION CD – GAS CONDITIONS

Gas Conditions			Inlet	Outlet
Gas Volume (SCFM; 68°F; 14.7 psia)				8683
Gas Temperature (°F)				1,140
Gas Pressure (in. H_2O)				
Gas Velocity (ft/sec)				184.3
Pollutant Concentration (Specify Pollutant and Unit of Concentration)	Pollutant	Unit of Concentration		
	NOx	g/bhp-hr	11.7	0.15 (permitting 0.9)
	CO	g/bhp-hr	9.9	0.3 (permitting 0.55)
	VOC	g/bhp-hr	0.5	0.04 (permitting 0.65)

Pressure Drop Through Gas Cleaning Device (in. H_2O)
TBD

INSTRUCTIONS FOR PERMIT APPLICATION FOR AIR POLLUTION CONTROL EQUIPMENT

1. Complete this form for each piece of equipment or process, which has air pollution control equipment installed, described in the following Permit Applications: Hazardous Air Pollutant (HAP) Sources (SFN 8329), Fuel Burning Equipment for Indirect Heating (SFN 8518); Manufacturing or Processing Equipment (SFN 8520); Incinerators/Crematories (SFN 8522); Internal Combustion Engines and Turbines (SFN 8891); and Glycol Dehydration Units (SFN 58923). Print or type all information. If an item does not apply, place NA in the appropriate space.

2. Type of Equipment - If the type is not one of those listed; provide enough information so the operating principal of the equipment can be determined.

3. List each pollutant which the device is intended to control, the efficiency of removal intended by the designer, and the actual efficiency under operating conditions.

4. Please attach the following:

   - A brief description and sketch of the air pollution control device if it is of unusual design or used in conjunction with other control devices. Show any bypass of the device and specify the conditions under which the bypass is used.

   - A description of what is done with collected air contaminants from the time they are collected until they reach the final disposal point. Include a description of the transportation methods used.

   - If a stack test has been conducted, attach a copy of the results, date of the test, a description of the techniques used, and the name and address of the organization which performed the test.

5. If the control device is a combustor (e.g.: thermal oxidizer, vapor combustion unit, etc.), include an estimate of potential greenhouse gas emissions (CO_2e).

SUBMIT YOUR APPLICATION WITH ALL SUPPORTING DOCUMENTS, ALONG WITH THE FORMS SPECIFIED IN THE FIRST PARAGRAPH ABOVE, TO:

North Dakota Department of Environmental Quality
Division of Air Quality
4201 Normandy Street, 2nd Floor
Bismarck, ND 58503-1324
(701) 328-5188

PERMIT APPLICATION FOR HAZARDOUS AIR POLLUTANT (HAP) SOURCES

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR QUALITY
SFN 8329 (9-2021)

SECTION A1 - APPLICANT INFORMATION

Name of Firm or Organization Hiland Partners Holdings LLC		
Applicant's Name Jason Burow		
Title EHS Engineer	Telephone Number (713) 420-2813	E-mail Address jason_burow@kindermorgan.com
Mailing Address (Street & No.) 1001 Louisiana Street, Suite 1000		
City Houston	State TX	ZIP Code 77002

SECTION A2 - FACILITY INFORMATION

Contact Person for Air Pollution Matters Jason Burow		
Title EHS Engineer	Telephone Number (713) 420-2813	E-mail Address jason_burow@kindermorgan.com
Facility Address (Street & No. or Lat/Long to Nearest Second) 10370 88th Street		
City McGregor	State ND	ZIP Code 58755
County Divide	Number of Employees at Location 10	
Land Area at Plant Site 12 Acres (or) Sq. Ft.	MSL Elevation at Plant 2343	

Describe Nature of Business/Process Natural gas processing plant

SECTION B – STACK DATA

Inside Diameter (ft) 12 inches	Height Above Grade (ft) 1.5 X Building Height (approximately 35 ft)	
Gas Temperature at Exit (°F) 1,140	Gas Velocity at Exit (ft/sec) 184.3	Gas Volume (scfm) 8683
Basis of any Estimates (attach separate sheet if necessary)		
Are Emission Control Devices in Place? If YES – Complete SFN 8532 ■ Yes ☐ No		
Nearest Residences or Building Residence	Distance (ft) 5227	Direction Southwest
Nearest Property Line Property Line	Distance (ft) 100	Direction West

SECTION C – EMISSION STREAM DATA

Source ID Number SFN 8516 27	Mean Particle Diameter (um) Unknown
Flow Rate (scfm) 8683	Drift Velocity (ft/sec) Unknown
Stream Temperature (°F) 1,140	Particulate Concentration (gr/dscf) Unknown
Moisture Content (%) Unknown	Halogens or Metals Present? Unknown
Pressure (in. Hg) 749.9	Organic Content (ppmv) Unknown
Heat Content (Btu/scfm) Unknown	O_2 Content (%) Unknown

SECTION D – POLLUTANT SPECIFIC DATA
(Complete One Box for Each Pollutant in Emission Stream)

Pollutant Emitted Methanol	Chemical Abstract Services (CAS) Number 67-56-1
Proposed Emission Rate (lb/hr) 0.02	Emission Source (describe) 1900 hp Compressor Engine #27
Source Classification (process point, process fugitive, area fugitive) Process point	Pollutant Class and Form (organic/inorganic - particulate/vapor) Organic - Vapor
Concentration in Emission Stream (ppmv) Unknown	Vapor Pressure (in. Hg @ °F) Unknown
Solubility Unknown	Molecular Weight (lb/lb-mole) 32.04
Absorptive Properties Unknown	

Pollutant Emitted See calculations for the remaining HAPs	Chemical Abstract Services (CAS) Number
Proposed Emission Rate (lb/hr)	Emission Source (describe)
Source Classification (process point, process fugitive, area fugitive)	Pollutant Class and Form (organic/inorganic - particulate/vapor)
Concentration in Emission Stream (ppmv)	Vapor Pressure (in. Hg @ °F)
Solubility	Molecular Weight (lb/lb-mole)
Absorptive Properties	

(Add additional pages if necessary)

Signature of Applicant	Date 10/25/24

SEND COMPLETED APPLICATION AND ALL ATTACHMENTS TO:

North Dakota Department of Environmental Quality
Division of Air Quality
4201 Normandy Street, 2nd Floor
Bismarck, ND 58503-1324
(701) 328-5188

6.0 Appendices

Appendix A – Supporting Emission Calculations

Appendix B – Manufacturer Specifications

Hiland Partners Holdings LLC
Norse Gas Plant
Engine (EU27) Emissions
Equipment Data

Emission Unit (EU):	27		
Emission Unit Name:	Inlet Compressor #6 - Waukesha L7044GSI		
Engine Type:	4SRB		
Fuel Usage:	91.58	MMscf/yr	(Calculated value based on max fuel combustion rate.)
Horsepower:	1,900	bhp	
Speed:	1,200	rpm	
Hours of Operation:	8,760	hr/yr	
Max. Fuel Combustion Rate (HHV):	8,253	Btu/bhp-hr	(Based on Manufacturer Specs)
Fuel Heating Value (HHV):	1,500	Btu/scf	
Max. Heat Rate (HHV):	15.68	MMBtu/hr	
CO_2 GWP (100 year):	1		
CH_4 GWP (100 year):	25		
N_2O GWP (100 year):	298		

Pollutant	Emission Factor[1,2,3]	Units	Emission Factor Reference	Hourly Emissions (lb/hr)	Annual Emissions (ton/yr)
PM-10 (Front and Back Half)	0.0194	lb/MMBtu	AP-42 Table 3.2-3 (10/24)	0.30	1.33
NOx	0.90	g/BHP-hr	Engine Vendor	3.77	16.51
CO	0.55	g/BHP-hr	Engine Vendor	2.30	10.09
SO2	5.88E-04	lb/MMBtu	AP-42 Table 3.2-3 (10/24)	0.01	0.04
VOC	0.65	g/BHP-hr	Permit Limit	2.73	11.94
Total HAPs	**See EU27 HAPs Emissions Calcs**		Engine Vendor/AP-42 Table 3.2-3 (10/24)	0.10	0.43
Formaldehyde	0.001	g/BHP-hr	Engine Vendor	4.19E-03	0.02
Pollutant	**Emission Factor**	**Units**	**Emission Factor Reference**	**Hourly Emissions (lb/hr)**	**Annual Emissions (ton/yr)**
CO_2e	--	--	--	1,822	7,980
GHG	--	--	--	1,729	7,571
CO_2	110	lb/MMBtu	AP-42 Table 3.2-3 (10/24)	1,725	7,555
CH_4	0.23	lb/MMBtu	AP-42 Table 3.2-3 (10/24)	3.61	15.80
N_2O	2.2	lb/MMscf	AP-42 Table 1.4-2 (07/00)	0.02	0.10

Notes:

1. NOx, CO and VOC emissions based on EFs higher than what is listed in the engine spec sheet. Formaldehyde emissions are based on manufacturer data. PM/PM_{10} and SO_2 emissions based on AP-42 Table 3.2-3.
2. Per AP-42, all particulate is considered to be less than 1.0 micrometer in diameter. $PM = PM_{10} = PM_{2.5}$
3. VOC emissions include formaldehyde.

Sample Calculation:

PM-10 Emissions (ton/yr) = (Emission Factor, lb/MMBtu) x (Max Heat Input Rate (HHV), MMBtu/hr) x (Hours of Operation, hr/yr) / (2,000 lb/ton)
PM-10 Emissions (ton/yr) = (0.01941 lb/MMBtu) x (15.68 MMBtu/hr) x (8,760 hr/yr) / (2,000 lb/ton) = 1.33 ton/yr

VOC Emissions (ton/yr) = (Emission Factor, g/bhp-hr) x (Horsepower, bhp) x (Hours of Operation, hr/yr) / (2,000 lb/ton) / (453.59 grams/1 lb)
VOC Emissions (ton/yr) = (0.65 g/bhp-hr) x (1900 bhp) x (8,760 hr/yr) / (2,000 lb/ton) / (453.59 g/lb) = 11.94 ton/yr

CO_2e Emissions (ton/yr) = (CO_2 emissions x 1) + (CH_4 emissions x 25) + (N_2O emissions x 298)
CO_2e Emissions (ton/yr) = ((7554.96 ton/yr x 1) + (15.80 ton/yr x 25) + (0.10 ton/yr x 298)) = 7979.90 ton/yr

GHG Emissions (ton/yr) = (CO_2 emissions) + (CH_4 emissions) + (N_2O emissions)
GHG Emissions (ton/yr) = (7554.96 ton/yr) + (15.80 ton/yr) + (0.10 ton/yr) = 7570.86 ton/yr

Hiland Partners Holdings LLC
Norse Gas Plant
Engine (EU27) HAPs Emissions
Equipment Data

Emission Unit (EU):	27				
Emission Unit Name:	Inlet Compressor #6 - Waukesha L7044GSI				
Engine Type:	4SRB				
Engines	**Horsepower (hp)**	**Hours per Year**	**Heat Input (MMBtu/hr)**	**Heat Input (MMBtu/yr)**	**Fuel Input (MMscf/yr)**
Engine EU1	1,900	8,760	16	137,363	91.58

HAPs	Emission Factor		Control Efficiency	Controlled Emissions	Controlled Emissions	Notes
	(lb/MMBtu)	(g/bhp-hr)	(%)	(lb/hr)	(tpy)	
1,1,2,2-Tetrachloroethane	2.53E-05	--	50%	1.98E-04	8.69E-04	1,3
1,1,2-Trichloroethane	1.53E-05	--	50%	1.20E-04	5.25E-04	1,3
1,1-Dichloroethane	1.13E-05	--	50%	8.86E-05	3.88E-04	1,3
1,2-Dichloroethane	1.13E-05	--	50%	8.86E-05	3.88E-04	1,3
1,2-Dichloropropane	1.30E-05	--	50%	1.02E-04	4.46E-04	1,3
1,3-Butadiene	6.63E-04	--	50%	0.01	0.02	1,3
1,3-Dichloropropene	1.27E-05	--	50%	9.96E-05	4.36E-04	1,3
Acetaldehyde	2.79E-03	--	50%	0.02	0.10	1,3
Acrolein	2.63E-03	--	50%	0.02	0.09	1,3
Benzene	1.58E-03	--	50%	0.01	0.05	1,3
Carbon Tetrachloride	1.77E-05	--	50%	1.39E-04	6.08E-04	1,3
Chlorobenzene	1.29E-05	--	50%	1.01E-04	4.43E-04	1,3
Chloroform	1.37E-05	--	50%	1.07E-04	4.70E-04	1,3
Ethylbenzene	2.48E-05	--	50%	1.94E-04	8.52E-04	1,3
Ethylene Dibromide	2.13E-05	--	50%	1.67E-04	7.31E-04	1,3
Formaldehyde	--	1.00E-03	--	4.19E-03	0.02	2
Methanol	3.06E-03	--	50%	0.02	0.11	1,3
Methylene Chloride	4.12E-05	--	50%	3.23E-04	1.41E-03	1,3
Naphthalene	9.71E-05	--	50%	7.61E-04	3.33E-03	1,3
PAH	1.41E-04	--	50%	1.11E-03	4.84E-03	1,3
Styrene	1.19E-05	--	50%	9.33E-05	4.09E-04	1,3
Toluene	5.58E-04	--	50%	4.37E-03	0.02	1,3
Vinyl Chloride	7.18E-06	--	50%	5.63E-05	2.47E-04	1,3
Xylene	1.95E-04	--	50%	1.53E-03	0.01	1,3

Notes:

1. Emission factor from AP-42 Table 3.2-3, Uncontrolled Emission Factors for 4-Stroke Rich-Burn Engines (October 2024)
2. Vendor Information.
3. Control efficiency from the dual catalytic converter unit was conservatively assumed to be 50% per verbal guidance by NDDH on 4/29/10.

Hiland Partners Holdings LLC
Norse Gas Plant
Fugitive Emissions

Component Type	Service	Emission Factor [1] (lb/hr/comp)	Component Count	Total Loss (lb/hr)	Total Loss (tpy)
Valves	Gas/Vapor	0.00992	148	1.47	6.43
	Light Liquid	0.0055	44	0.24	1.06
Pumps	Gas Vapor	0.00529	0	0.00	0.00
	Light Liquid	0.02866	1	0.03	0.13
Flanges [2]	Gas/Vapor	0.00086	2406	2.07	9.06
	Light Liquid	0.000243	90	0.02	0.10
Connectors	Gas/Vapor	0.00044	0	0.00	0.00
	Light Liquid	0.000463	0	0.00	0.00
Open Ended Lines	Gas/Vapor	0.00441	0	0.00	0.00
	Light Liquid	0.00309	0	0.00	0.00
Other [3]	Gas/Vapor	0.0194	0	0.00	0.00
	Light Liquid	0.0165	0	0.00	0.00
Compressors	Gas/Vapor	0.0194	9	0.17	0.76
	Light Liquid	0.0165	0	0.00	0.00
Component Emission Total Losses				4.00	17.54
Gas/Vapor Emissions				3.71	16.26
Light Liquid Emissions				0.29	1.28

Component	Gas (wt%)	Gas/Vapor Emissions		Total Emissions [4]	
		(lb/hr)	(tpy)	(lb/hr)	(tpy)
CO_2	1.237	0.046	0.201	0.046	0.201
Nitrogen	1.785	0.066	0.290	0.066	0.290
H_2S	0	0	0	0.000	0.000
Methane	34.835	1.293	5.664	1.293	5.664
Ethane	22.920	0.851	3.726	0.851	3.726
Propane	18.281	0.679	2.972	0.679	2.972
i-Butane	3.052	0.113	0.496	0.113	0.496
n-Butane	9.189	0.341	1.494	0.341	1.494
i-Pentane	2.250	0.084	0.366	0.084	0.366
n-Pentane	3.292	0.122	0.535	0.122	0.535
Benzene	0.071	0.003	0.011	0.003	0.011
n-Hexane	0.678	0.025	0.110	0.025	0.110
Hexanes	1.131	0.042	0.184	0.042	0.184
Toluene	0.066	0.002	0.011	0.002	0.011
Heptanes	0.833	0.031	0.135	0.031	0.135
Ethylbenzene	0.016	0.001	0.003	0.001	0.003
Xylenes	0.048	0.002	0.008	0.002	0.008
Octanes	0.271	0.010	0.044	0.010	0.044
Nonanes	0.019	0.001	0.003	0.001	0.003
C10+	0.027	0.001	0.004	0.001	0.004
Total	**100.000**	**3.712**	**16.258**	**3.712**	**16.258**
Total VOC	**39.224**	**1.456**	**6.377**	**1.748**	**7.658**
Total HAPs	**0.878**	**0.033**	**0.143**	**0.033**	**0.143**

Notes:

1. Emission factors are from EPA's "Protocol for Equipment Leak Emission Estimates" EPA-453/R-95-017, 11/1995, Table 2-4.

2. Maintenance Plugs & Blind Flanges are treated as screwed connectors. Per TCEQ's "Air Permit Technical Guidance for Chemical Sources: Equipment Leak Fugitives" dated October 2000, screwed fittings should be estimated as flanges.

3. For Oil and Gas Production Operations, "Other" includes compressors, diaphrams, drains, dump arms, hatches, instruments, meters, pressure relief valves, polished rods, relief valves, and vents.

4. The total emissions include the light liquid emissions assuming 100% VOC of light liquid.

VHP - L7044GSI S5

Gas Compression

ENGINE SPEED (rpm):	1200	NOx SELECTION (g/bhp-hr):	Customer Catalyst
DISPLACEMENT (in3):	7040	COOLING SYSTEM:	JW, IC + OC
COMPRESSION RATIO:	9.7:1	INTERCOOLER WATER INLET (°F):	130
IGNITION SYSTEM:	ESM2	JACKET WATER OUTLET (°F):	180
EXHAUST MANIFOLD:	Water Cooled	JACKET WATER CAPACITY (gal):	100
COMBUSTION:	Rich Burn, Turbocharged	AUXILIARY WATER CAPACITY (gal):	11
ENGINE DRY WEIGHT (lbs):	24250	LUBE OIL CAPACITY (gal):	190
AIR/FUEL RATIO SETTING:	0.38% CO	MAX. EXHAUST BACKPRESSURE (in. H2O):	20
ENGINE SOUND LEVEL (dBA)	102.7	MAX. AIR INLET RESTRICTION (in. H2O):	15
IGNITION TIMING:	ESM2 Controlled	EXHAUST SOUND LEVEL (dBA)	98.9

SITE CONDITIONS:

FUEL:	Natural Gas	ALTITUDE (ft):	3000
FUEL PRESSURE RANGE (psig):	40 - 60	MAXIMUM INLET AIR TEMPERATURE (°F):	100
FUEL HHV (BTU/ft3):	1,274.3	FUEL WKI:	59.7
FUEL LHV (BTU/ft3):	1,151.9		

SITE SPECIFIC TECHNICAL DATA

POWER RATING	UNITS		MAX RATING AT 100 °F AIR TEMP	SITE RATING AT MAXIMUM INLET AIR TEMPERATURE OF 100 °F		
				100%	75%	51%
CONTINUOUS ENGINE POWER	BHP		1881	1881	1411	950
OVERLOAD	% 2/24 hr		0	0	-	-
MECHANICAL EFFICIENCY (LHV)	%		34.1	34.1	33.5	31.7
CONTINUOUS POWER AT FLYWHEEL	BHP		1881	1881	1411	950
based on no auxiliary engine driven equipment						
AVAILABLE TURNDOWN SPEED RANGE	RPM		900 - 1200			
FUEL CONSUMPTION						
FUEL CONSUMPTION (LHV)	BTU/BHP-hr		7461	7461	7609	8033
FUEL CONSUMPTION (HHV)	BTU/BHP-hr		8253	8253	8417	8886
FUEL FLOW *based on fuel analysis LHV*	SCFM		203	203	155	110
HEAT REJECTION						
JACKET WATER (JW)	BTU/hr x 1000		3842	3842	3061	2291
LUBE OIL (OC)	BTU/hr x 1000		497	497	453	399
INTERCOOLER (IC)	BTU/hr x 1000		726	726	405	155
EXHAUST	BTU/hr x 1000		3844	3844	2856	1975
RADIATION	BTU/hr x 1000		609	609	576	544
EMISSIONS (ENGINE OUT):						
NOx (NO + NO2)	g/bhp-hr		11.8	11.8	13.1	13.7
CO	g/bhp-hr		9.7	9.7	9.6	9.8
THC	g/bhp-hr		0.3	0.3	0.3	0.3
NMHC	g/bhp-hr		0.12	0.12	0.21	0.31
NM,NEHC (VOC)	g/bhp-hr		0.05	0.05	0.08	0.12
CO2	g/bhp-hr		480	480	490	517
CO2e	g/bhp-hr		484	484	496	526
CH2O	g/bhp-hr		0.001	0.001	0.001	0.001
CH4	g/bhp-hr		0.14	0.14	0.24	0.35
AIR INTAKE / EXHAUST GAS						
INDUCTION AIR FLOW	SCFM		2626	2626	2009	1429
EXHAUST GAS MASS FLOW	lb/hr		12210	12210	9339	6643
EXHAUST GAS FLOW *at exhaust temp, 14.5 psia*	ACFM		8683	8683	6512	4538
EXHAUST TEMPERATURE	°F		1140	1140	1109	1077

HEAT EXCHANGER SIZING[12]			
TOTAL JACKET WATER CIRCUIT (JW)	BTU/hr x 1000		4357
TOTAL AUXILIARY WATER CIRCUIT (IC + OC)	BTU/hr x 1000		1387

COOLING SYSTEM WITH ENGINE MOUNTED WATER PUMPS		
JACKET WATER PUMP MIN. DESIGN FLOW	GPM	450
JACKET WATER PUMP MAX. EXTERNAL RESTRICTION	psig	16
AUX WATER PUMP MIN. DESIGN FLOW	GPM	79
AUX WATER PUMP MAX. EXTERNAL RESTRICTION	psig	36

All data provided per the condtions listed in the notes section on page three

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VHP - L7044GSI S5

Gas Compression

FUEL COMPOSITION

HYDROCARBONS:		Mole or Volume %
Methane	CH4	69.39
Ethane	C2H6	19.31
Propane	C3H8	6.64
Iso-Butane	I-C4H10	0.43
Normal Butane	N-C4H10	0.88
Iso-Pentane	I-C5H12	0.0692
Normal Pentane	N-C5H12	0.0815
Hexane	C6H14	0.1201
Heptane	C7H16	0
Ethene	C2H4	0
Propene	C3H6	0
	SUM HYDROCARBONS	96.921
NON-HYDROCARBONS:		
Nitrogen	N2	2.183
Oxygen	O2	0
Helium	He	0
Carbon Dioxide	CO2	0.8857
Carbon Monoxide	CO	0
Hydrogen	H2	0
Water Vapor	H2O	0
	TOTAL FUEL	99.99

FUEL:	Natural Gas
FUEL PRESSURE RANGE (psig):	40 - 60
FUEL WKI:	59.7
FUEL SLHV (BTU/ft3):	1131.89
FUEL SLHV (MJ/Nm3):	44.51
FUEL LHV (BTU/ft3):	1151.93
FUEL LHV (MJ/Nm3):	45.30
FUEL HHV (BTU/ft3):	1274.26
FUEL HHV (MJ/Nm3):	50.11
FUEL DENSITY (SG):	0.75

Standard Conditions per ASTM D3588-91 [60°F and 14.696psia] and ISO 6976:1996-02-01[25, V(0;101.325)].
Based on the fuel composition, supply pressure and temperature, liquid hydrocarbons may be present in the fuel. No liquid hydrocarbons are allowed in the fuel. The fuel must not contain any liquid water. Waukesha recommends both of the following:
1) Dew point of the fuel gas to be at least 20°F (11°C) below the measured temperature of the gas at the inlet of the engine fuel regulator.
2) A fuel filter separator to be used on all fuels except commercial quality natural gas.
Refer to the 'Fuel and Lubrication' section of 'Technical Data' or contact the Waukesha Application Engineering Department for additional information on fuels, or LHV and WKI* calculations.
* Trademark of General Electric Company

FUEL CONTAMINANTS

Total Sulfur Compounds	0	% volume
Total Halogen as Cloride	0	% volume
Total Ammonia	0	% volume
Siloxanes		
Tetramethyl silane	0	% volume
Trimethyl silanol	0	% volume
Hexamethyldisiloxane (L2)	0	% volume
Hexamethylcyclotrisiloxane (D3)	0	% volume
Octamethyltrisiloxane (L3)	0	% volume
Octamethylcyclotetrasiloxane (D4)	0	% volume
Decamethyltetrasiloxane (L4)	0	% volume
Decamethylcyclopentasiloxane (D5)	0	% volume
Dodecamethylpentasiloxane (L5)	0	% volume
Dodecamethylcyclohexasiloxane (D6)	0	% volume
Others	0	% volume

Total Sulfur Compounds	0 µg/BTU
Total Halogen as Cloride	0 µg/BTU
Total Ammonia	0 µg/BTU
Total Siloxanes (as Si)	0 µg/BTU

Calculated fuel contaminant analysis will depend on the entered fuel composition and selected engine model.

No water or hydrocarbon condensates are allowed in the engine. Requires liquids removal.

VHP - L7044GSI S5

Gas Compression

ENGINE SPEED (rpm):	1200	NOx SELECTION (g/bhp-hr):	0.15
DISPLACEMENT (in3):	7040	COOLING SYSTEM:	JW, IC + OC
COMPRESSION RATIO:	9.7:1	INTERCOOLER WATER INLET (°F):	130
IGNITION SYSTEM:	ESM2	JACKET WATER OUTLET (°F):	180
EXHAUST MANIFOLD:	Water Cooled	JACKET WATER CAPACITY (gal):	100
COMBUSTION:	Rich Burn, Turbocharged	AUXILIARY WATER CAPACITY (gal):	11
ENGINE DRY WEIGHT (lbs):	24250	LUBE OIL CAPACITY (gal):	190
AIR/FUEL RATIO SETTING:	0.38% CO	MAX. EXHAUST BACKPRESSURE (in. H2O):	20
ENGINE SOUND LEVEL (dBA)	102.7	MAX. AIR INLET RESTRICTION (in. H2O):	15
IGNITION TIMING:	ESM2 Controlled	EXHAUST SOUND LEVEL (dBA)	98.9

SITE CONDITIONS:

FUEL:	Natural Gas	ALTITUDE (ft):	3000
FUEL PRESSURE RANGE (psig):	40 - 60	MAXIMUM INLET AIR TEMPERATURE (°F):	100
FUEL HHV (BTU/ft3):	1,274.3	FUEL WKI:	59.7
FUEL LHV (BTU/ft3):	1,151.9		

SITE SPECIFIC TECHNICAL DATA

POWER RATING	UNITS		MAX RATING AT 100 °F AIR TEMP	SITE RATING AT MAXIMUM INLET AIR TEMPERATURE OF 100 °F		
				100%	95%	76%
CONTINUOUS ENGINE POWER	BHP		1881	1881	1787	1425
OVERLOAD	% 2/24 hr		0	0	-	-
MECHANICAL EFFICIENCY (LHV)	%		34.1	34.1	34.1	33.5
CONTINUOUS POWER AT FLYWHEEL	BHP		1881	1881	1787	1425
based on no auxiliary engine driven equipment						
AVAILABLE TURNDOWN SPEED RANGE	RPM		900 - 1200			
FUEL CONSUMPTION						
FUEL CONSUMPTION (LHV)	BTU/BHP-hr		7461	7461	7479	7601
FUEL CONSUMPTION (HHV)	BTU/BHP-hr		8253	8253	8273	8409
FUEL FLOW *based on fuel analysis LHV*	SCFM		203	203	193	157
HEAT REJECTION						
JACKET WATER (JW)	BTU/hr x 1000		3842	3842	3687	3085
LUBE OIL (OC)	BTU/hr x 1000		497	497	489	455
INTERCOOLER (IC)	BTU/hr x 1000		726	726	657	413
EXHAUST	BTU/hr x 1000		3844	3844	3639	2885
RADIATION	BTU/hr x 1000		609	609	602	577
EMISSIONS (CATALYST OUT):						
NOx (NO + NO2)	g/bhp-hr		0.15	0.15	0.15	0.15
CO	g/bhp-hr		0.3	0.3	0.3	0.3
THC	g/bhp-hr		0.2	0.2	0.2	0.2
NMHC	g/bhp-hr		0.09	0.09	0.09	0.14
NM,NEHC (VOC)	g/bhp-hr		0.04	0.04	0.04	0.06
CO2	g/bhp-hr		480	480	482	490
CO2e	g/bhp-hr		483	483	484	494
CH2O	g/bhp-hr		0.001	0.001	0.001	0.001
CH4	g/bhp-hr		0.11	0.11	0.11	0.16
AIR INTAKE / EXHAUST GAS						
INDUCTION AIR FLOW	SCFM		2626	2626	2501	2027
EXHAUST GAS MASS FLOW	lb/hr		12210	12210	11627	9424
EXHAUST GAS FLOW *at exhaust temp, 14.5 psia*	ACFM		8683	8683	8237	6572
EXHAUST TEMPERATURE	°F		1140	1140	1134	1109

HEAT EXCHANGER SIZING[12]			
TOTAL JACKET WATER CIRCUIT (JW)	BTU/hr x 1000		4357
TOTAL AUXILIARY WATER CIRCUIT (IC + OC)	BTU/hr x 1000		1387

COOLING SYSTEM WITH ENGINE MOUNTED WATER PUMPS		
JACKET WATER PUMP MIN. DESIGN FLOW	GPM	450
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AUX WATER PUMP MAX. EXTERNAL RESTRICTION	psig	36

All data provided per the condtions listed in the notes section on page three.

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VHP - L7044GSI S5

Gas Compression

FUEL COMPOSITION

HYDROCARBONS:		Mole or Volume %
Methane	CH4	69.39
Ethane	C2H6	19.31
Propane	C3H8	6.64
Iso-Butane	I-C4H10	0.43
Normal Butane	N-C4H10	0.88
Iso-Pentane	I-C5H12	0.0692
Normal Pentane	N-C5H12	0.0815
Hexane	C6H14	0.1201
Heptane	C7H16	0
Ethene	C2H4	0
Propene	C3H6	0
	SUM HYDROCARBONS	96.921
NON-HYDROCARBONS:		
Nitrogen	N2	2.183
Oxygen	O2	0
Helium	He	0
Carbon Dioxide	CO2	0.8857
Carbon Monoxide	CO	0
Hydrogen	H2	0
Water Vapor	H2O	0
	TOTAL FUEL	99.99

FUEL:	Natural Gas
FUEL PRESSURE RANGE (psig):	40 - 60
FUEL WKI:	59.7
FUEL SLHV (BTU/ft3):	1131.89
FUEL SLHV (MJ/Nm3):	44.51
FUEL LHV (BTU/ft3):	1151.93
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FUEL HHV (BTU/ft3):	1274.26
FUEL HHV (MJ/Nm3):	50.11
FUEL DENSITY (SG):	0.75

Standard Conditions per ASTM D3588-91 [60°F and 14.696psia] and ISO 6976:1996-02-01[25, V(0;101.325)].
Based on the fuel composition, supply pressure and temperature, liquid hydrocarbons may be present in the fuel. No liquid hydrocarbons are allowed in the fuel. The fuel must not contain any liquid water. Waukesha recommends both of the following:
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* Trademark of General Electric Company

FUEL CONTAMINANTS

Total Sulfur Compounds	0	% volume
Total Halogen as Cloride	0	% volume
Total Ammonia	0	% volume
Siloxanes		
Tetramethyl silane	0	% volume
Trimethyl silanol	0	% volume
Hexamethyldisiloxane (L2)	0	% volume
Hexamethylcyclotrisiloxane (D3)	0	% volume
Octamethyltrisiloxane (L3)	0	% volume
Octamethylcyclotetrasiloxane (D4)	0	% volume
Decamethyltetrasiloxane (L4)	0	% volume
Decamethylcyclopentasiloxane (D5)	0	% volume
Dodecamethylpentasiloxane (L5)	0	% volume
Dodecamethylcyclohexasiloxane (D6)	0	% volume
Others	0	% volume

Total Sulfur Compounds	0 µg/BTU
Total Halogen as Cloride	0 µg/BTU
Total Ammonia	0 µg/BTU
Total Siloxanes (as Si)	0 µg/BTU

Calculated fuel contaminant analysis will depend on the entered fuel composition and selected engine model.

No water or hydrocarbon condensates are allowed in the engine. Requires liquids removal.

NOTES

1. All data is based on engines with standard configurations unless noted otherwise.

2. Power rating is adjusted for fuel, site altitude, and site air inlet temperature, in accordance with ISO 3046/1 with tolerance of ± 3%.

3. Fuel consumption is presented in accordance with ISO 3046/1 with a tolerance of -0 / +5% at maximum rating. Fuel flow calculation based on fuel LHV and fuel consumption with a tolerance of -0/+5 %. For sizing piping and fuel equipment, it is recommended to include the 5% tolerance.

4. Heat rejection tolerances are ± 30% for radiation, and ± 8% for jacket water, lube oil, intercooler, and exhaust energy.

5. Emission levels for engines with GE supplied 3-way catalyst are given at catalyst outlet flange. For all other engine models, emission levels are given at engine exhaust outlet flange prior to any after treatment. Values are based on a new engine operating at indicated site conditions, and adjusted to the specified timing and air/fuel ratio at rated load. Catalyst out emission levels represent emission levels the catalyst is sized to achieve. Manual adjustment may be necessary to achieve compliance as catalyst/engine age. Catalyst-out emission levels are valid for the duration of the engine warranty. Emissions are at an absolute humidity of 75 grains H2O/lb (10.71 g H2O/kg) of dry air. Emission levels may vary subject to instrumentation, measurement, ambient conditions, fuel quality, and engine variation. Engine may require adjustment on-site to meet emission values, which may affect engine performance and heat output. NOx, CO, THC, and NMHC emission levels are listed as a not to exceed limit, all other emission levels are estimated. CO2 emissions based on EPA Federal Register/Vol. 74, No. 209/Friday, October 30, 2009 Rules and Regulations 56398, 56399 (3) Tier 3 Calculation Methodology, Equation C-5.

6. Air flow is based on undried air with a tolerance of ± 7%.

7. Exhaust temperature given at engine exhaust outlet flange with a tolerance of ± 50°F (28°C).

8. Exhaust gas mass flow value is based on a "wet basis" with a tolerance of ± 7%.

9. Inlet air restrictions based on full rated engine load. Exhaust backpressure based on 178.1 PSI BMEP and 1200 RPM. Refer to the engine specification section of Waukesha's standard technical data for more information.

10. Cooling circuit capacity, lube oil capacity, and engine dry weight values are typical.

11. Fuel must conform to Waukesha's "Gaseous Fuel Specification" S7884-7 or most current version. Fuel may require treatment to meet current fuel specification.

12. Heat exchanger sizing values given as the maximum heat rejection of the circuit, with applied tolerances and an additional 5% reserve factor.

13. Fuel volume flow calculation in english units is based on 100% relative humidity of the fuel gas at standard conditions of 60°F and 14.696 psia (29.92 inches of mercury; 101.325 kPa).

14. Fuel volume flow calculation in metric units is based on 100% relative humidity of the fuel gas at a combustion temperature of 25°C and metering conditions of 0°C and 101.325 kPa (14.696 psia; 29.92 inches of mercury). This is expressed as [25, V(0;101.325)].

15. Engine sound data taken with the microphone at 1 m (3.3 ft) from the side of the engine at the approximate front-to-back centerline. Microphone height was at intake manifold level. Engine sound pressure data may be different at front, back and opposite side locations. Exhaust sound data taken with microphone 1 meter (3.3 ft) away and 1 meter (3.3 ft) to the side of the exhaust outlet.

16. Due to variation between test conditions and final site conditions, such as exhaust configuration and background sound level, sound pressure levels under site conditions may be different than those tabulated above.

17. Cooling system design flow is based on minimum allowable cooling system flow. Cooling system maximum external restriction is defined as the allowable restriction at the minimum cooling system flow.

18. Continuous Power Rating: The highest load and speed that can be applied 24 hours per day, seven days per week, 365 days per year except for normal maintenance at indicated ambient reference conditions and fuel. No engine overload power rating is available.

19. emPact emission compliance available for entire range of operable fuels; however, fuel system and/or O2 set point may need to be adjusted in order to maintain compliance.

20. In cold ambient temperatures, heating of the engine jacket water, lube oil and combustion air may be required. See Waukesha Technical Data.

21. Available Turndown Speed Range refers to the constant torque speed range available. Reduced power may be available at speeds outside of this range. Contact application engineering.

SPECIAL REQUIREMENTS