May 9, 2024

New Mexico Environment Department
Air Quality Bureau
525 Camino de los Marquez, Suite 1
Santa Fe, New Mexico, 87505

RE: New Source Review (NSR) Construction Permit Application
Horned Frog Compressor Station, Lea County, New Mexico
Delaware G&P, LLC

Dear Air Quality Bureau,

Delaware G&P, LLC (Delaware) submits the enclosed application for issuance of a New Source Review (NSR) Construction Permit to allow for additional compression at the existing Horned Frog Compressor Station.

The facility currently operates under Oil and Gas General Construction Permit (GCP-Oil and Gas) No. 7868M5.

A permit filing fee of $500 was mailed to the department with the application. Electronic files will be transferred via secure electronic transfer initiated by the assigned permit writer.

Any clarification questions or requests for additional information can be directed to myself via email to jj@resolutecompliance.com or by phone at 903-241-2055 or Mr. Lance Green via email to Lance.Green@enlink.com or by phone at 225-692-6947.

Kind Regards,

Jeff A. Jackson

Vice President EHSR

Encl: Initial NSR Permit via the Universal Application Form

Cc: Mr. Lance Green – Lead Environmental Permitting Specialist
Ms. Daria Underwood – Lead Environmental Engineer

Mail Application To:		**For Department use only:**
New Mexico Environment Department Air Quality Bureau Permits Section 525 Camino de los Marquez, Suite 1 Santa Fe, New Mexico, 87505 Phone: (505) 476-4300 Fax: (505) 476-4375 www.env.nm.gov/aqb		

Universal Air Quality Permit Application

Use this application for NOI, NSR, or Title V sources.

Use this application for: the initial application, modifications, technical revisions, and renewals. For technical revisions, complete Sections, 1-A, 1-B, 2-E, 3, 9 and any other sections that are relevant to the requested action; coordination with the Air Quality Bureau permit staff prior to submittal is encouraged to clarify submittal requirements and to determine if more or less than these sections of the application are needed. Use this application for streamline permits as well.

This application is submitted as (check all that apply): ☐ Request for a No Permit Required Determination (no fee)
☐ **Updating** an application currently under NMED review. Include this page and all pages that are being updated (no fee required).
Construction Status: ☐ Not Constructed ☒ Existing Permitted (or NOI) Facility ☐ Existing Non-permitted (or NOI) Facility
Minor Source: ☐ NOI 20.2.73 NMAC ☒ 20.2.72 NMAC application or revision ☐ 20.2.72.300 NMAC Streamline application
Title V Source: ☐ Title V (new) ☐ Title V renewal ☐ TV minor mod. ☐ TV significant mod. ☐ TV Acid Rain: ☐ New ☐ Renewal
PSD Major Source: ☐ PSD major source (new) ☐ Minor Modification to a PSD source ☐ a PSD major modification

Acknowledgements:

☒ I acknowledge that a pre-application meeting is available to me upon request. ☐ Title V Operating, Title IV Acid Rain, and NPR applications have no fees.

☒ $500 NSR application Filing Fee enclosed OR ☐ The full permit fee associated with 10 fee points (required w/ streamline applications).

☒ Check No.: 1627 in the amount of $500

☒ I acknowledge the required submittal format for the hard copy application is printed double sided 'head-to-toe', 2-hole punched (except the Sect. 2 landscape tables is printed 'head-to-head'), numbered tab separators. Incl. a copy of the check on a separate page.

☒ I acknowledge there is an annual fee for permits in addition to the permit review fee: www.env.nm.gov/air-quality/permit-fees-2/.

☐ This facility qualifies for the small business fee reduction per 20.2.75.11.C. NMAC. The full $500.00 filing fee is included with this application and I understand the fee reduction will be calculated in the balance due invoice. The Small Business Certification Form has been previously submitted or is included with this application. (Small Business Environmental Assistance Program Information: www.env.nm.gov/air-quality/small-biz-eap-2/.)

Citation: Please provide the **low level citation** under which this application is being submitted: **20.2.70.200.A NMAC**
(e.g. application for a new minor source would be 20.2.72.200.A NMAC, one example for a Technical Permit Revision is 20.2.72.219.B.1.b NMAC, a Title V acid rain application would be: 20.2.70.200.C NMAC)

Section 1 – Facility Information

Section 1-A: Company Information

		AI # if known: 38473	Updating Permit/NOI #: 7868M5
1	Facility Name: Horned Frog Compressor Station	Plant primary SIC Code (4 digits): 1311	
		Plant NAIC code (6 digits): 211130	
a	Facility Street Address (If no facility street address, provide directions from a prominent landmark): 23.5 miles W of Jal		
2	Plant Operator Company Name: Delaware G & P, LLC	Phone/Fax: 225-692-6947	
a	Plant Operator Address: 1722 Routh Street, Suite 1300, Dallas, TX 75201		

b	Plant Operator's New Mexico Corporate ID or Tax ID:	
3	Plant Owner(s) name(s): Delaware G & P, LLC	Phone/Fax: 225-692-6947
a	Plant Owner(s) Mailing Address(s): 1722 Routh Street, Suite 1300, Dallas, TX 75201	
4	Bill To (Company): Delaware G & P, LLC	Phone/Fax: 225-692-6947
a	Mailing Address: 1722 Routh Street, Suite 1300, Dallas, TX 75201	E-mail: Lance.Green@EnLink.com
5	☒ Preparer: Resolute Compliance, LLC ☒ Consultant: Jeff Jackson	Phone/Fax: 903-241-2055
a	Mailing Address: PO Box 970, Royse City, TX 75189	E-mail: jj@resolutecompliance.com
6	Plant Operator Contact: Zac Luedecke	Phone/Fax: 469-308-7299
a	Address: P.O. Box 211, Mentone, TX 79754	E-mail: Richard.Luedecke@EnLink.com
7	Air Permit Contact: Lance Green	Title: Lead Environmental Permitting Specialist
a	E-mail: Lance.Green@enlink.com	Phone/Fax: 225-692-6947
b	Mailing Address: 1722 Routh Street, Suite 1300, Dallas, TX 75201	
c	The designated Air permit Contact will receive all official correspondence (i.e. letters, permits) from the Air Quality Bureau.	

Section 1-B: Current Facility Status

1.a	Has this facility already been constructed? ☒ Yes ☐ No	1.b If yes to question 1.a, is it currently operating in New Mexico? ☒ Yes ☐ No
2	If yes to question 1.a, was the existing facility subject to a Notice of Intent (NOI) (20.2.73 NMAC) before submittal of this application? ☐ Yes ☒ No	If yes to question 1.a, was the existing facility subject to a construction permit (20.2.72 NMAC) before submittal of this application? ☒ Yes ☐ No
3	Is the facility currently shut down? ☐ Yes ☒ No	If yes, give month and year of shut down (MM/YY):
4	Was this facility constructed before 8/31/1972 and continuously operated since 1972? ☐ Yes ☒ No	
5	If Yes to question 3, has this facility been modified (see 20.2.72.7.P NMAC) or the capacity increased since 8/31/1972? ☐ Yes ☐ No ☒ N/A	
6	Does this facility have a Title V operating permit (20.2.70 NMAC)? ☐ Yes ☒ No	If yes, the permit No. is: P-
7	Has this facility been issued a No Permit Required (NPR)? ☐ Yes ☒ No	If yes, the NPR No. is:
8	Has this facility been issued a Notice of Intent (NOI)? ☐ Yes ☒ No	If yes, the NOI No. is:
9	Does this facility have a construction permit (20.2.72/20.2.74 NMAC)? ☐ Yes ☒ No	If yes, the permit No. is:
10	Is this facility registered under a General permit (GCP-1, GCP-2, etc.)? ☒ Yes ☐ No	If yes, the register No. is: 7868M5

Section 1-C: Facility Input Capacity & Production Rate

1	What is the facility's maximum input capacity, specify units (reference here and list capacities in Section 20, if more room is required)			
a	Current	Hourly: 12.29 bbl Oil 5.2 MMSCF Natural Gas 15.21 bbl Produced Water	Daily: 295 bbl Oil 125 MMSCF Natural Gas 365 bbl Produced Water	Annually: 107,675 bbl Oil 45,625 MMSCF Natural Gas 133,225 bbl Produced Water
b	Proposed	Hourly: 16.35 bbl Oil 5.2 MMSCF Natural Gas 20.22 bbl Produced Water	Daily: 392.35 bbl Oil 125 MMSCF Natural Gas 485.45 bbl Produced Water	Annually: 143,208 bbl Oil 45,625 MMSCF Natural Gas 177,190 bbl Produced Water
2	What is the facility's maximum production rate, specify units (reference here and list capacities in Section 20, if more room is required)			
a	Current	Hourly: 12.29 bbl Oil 5.2 MMSCF Natural Gas 15.21 bbl Produced Water	Daily: 295 bbl Oil 125 MMSCF Natural Gas 365 bbl Produced Water	Annually: 107675 bbl Oil 45,625 MMSCF Natural Gas 133225 bbl Produced Water
b	Proposed	Hourly: 16.35 bbl Oil 5.2 MMSCF Natural Gas 20.22 bbl Produced Water	Daily: 392.35 bbl Oil 125 MMSCF Natural Gas 485.45 bbl Produced Water	Annually: 143,208 bbl Oil 45,625 MMSCF Natural Gas 177,190 bbl Produced Water

Section 1-D: Facility Location Information

1	Latitude (decimal degrees): 32.083086	Longitude (decimal degrees): -103.588061	County: Lea	Elevation (ft): 3325
2	UTM Zone: ☐ 12 or ☒ 13	Datum: ☐ NAD 83 ☒ WGS 84		
a	UTM E (in meters, to nearest 10 meters): 633250	UTM N (in meters, to nearest 10 meters): 3550517		
3	Name and zip code of nearest New Mexico town: Jal 88252			
4	Detailed Driving Instructions from nearest NM town (attach a road map if necessary): From Bennett, New Mexico, go west on Anthony Road for 21.91 miles, turn North on an unnamed road 2.44 miles west of the intersection of Anthony Road and Hwy 2. The facility is 1.51 miles on the east side of the unnamed road.			
5	The facility is 23.5 (distance) miles W (direction) of Jal (nearest town).			
6	Land Status of facility (check one): ☐ Private ☐ Indian/Pueblo ☒ Government ☐ BLM ☐ Forest Service ☐ Military			
7	List all municipalities, Indian tribes, and counties within a ten (10) mile radius (20.2.72.203.B.2 NMAC) of the property on which the facility is proposed to be constructed or operated: Lea County, Eddy County, Texas			
8	**20.2.72** NMAC applications **only**: Will the property on which the facility is proposed to be constructed or operated be closer than 50 km (31 miles) to other states, Bernalillo County, or a Class I area (see www.env.nm.gov/air-quality/modeling-publications/)? ☐ Yes ☒ No (20.2.72.206.A.7 NMAC) If yes, list all with corresponding distances in kilometers:			
9	Name nearest Class I area: Carlsbad Caverns National Park			
10	Shortest distance (in km) from facility boundary to the boundary of the nearest Class I area (to the nearest 10 meters): 74.5 km			
11	Distance (meters) from the perimeter of the Area of Operations (AO is defined as the plant site inclusive of all disturbed lands, including mining overburden removal areas) to nearest residence, school or occupied structure: > 5 miles			
12	Method(s) used to delineate the Restricted Area: Continuous Fencing "**Restricted Area**" is an area to which public entry is effectively precluded. Effective barriers include continuous fencing, continuous walls, or other continuous barriers approved by the Department, such as rugged physical terrain with steep grade that would require special equipment to traverse. If a large property is completely enclosed by fencing, a restricted area within the property may be identified with signage only. Public roads cannot be part of a Restricted Area.			
13	Does the owner/operator intend to operate this source as a portable stationary source as defined in 20.2.72.7.X NMAC? ☐ Yes ☒ No A portable stationary source is not a mobile source, such as an automobile, but a source that can be installed permanently at one location or that can be re-installed at various locations, such as a hot mix asphalt plant that is moved to different job sites.			
14	Will this facility operate in conjunction with other air regulated parties on the same property? ☒ No ☐ Yes If yes, what is the name and permit number (if known) of the other facility?			

Section 1-E: Proposed Operating Schedule (The 1-E.1 & 1-E.2 operating schedules may become conditions in the permit.)

1	Facility **maximum** operating ($\frac{hours}{day}$): 24	($\frac{days}{week}$): 7	($\frac{weeks}{year}$): 52	($\frac{hours}{year}$): 8760		
2	Facility's maximum daily operating schedule (if less than 24 $\frac{hours}{day}$)? Start:		☐AM ☐PM	End:	☐AM ☐PM	
3	Month and year of anticipated start of construction: Upon Permit Issuance					
4	Month and year of anticipated construction completion: Upon Permit Issuance					
5	Month and year of anticipated startup of new or modified facility: Upon Permit Issuance					
6	Will this facility operate at this site for more than one year? ☒ Yes ☐ No					

Section 1-F: Other Facility Information

1	Are there any current Notice of Violations (NOV), compliance orders, or any other compliance or enforcement issues related to this facility? ☐ Yes ☒ No If yes, specify:

a	If yes, NOV date or description of issue:		NOV Tracking No:
b	Is this application in response to any issue listed in 1-F, 1 or 1a above? ☐ Yes ☒ No If Yes, provide the 1c & 1d info below:		
c	Document Title:	Date:	Requirement # (or page # and paragraph #):
d	Provide the required text to be inserted in this permit:		
2	Is air quality dispersion modeling or modeling waiver being submitted with this application? ☒ Yes ☐ No		
3	Does this facility require an "Air Toxics" permit under 20.2.72.400 NMAC & 20.2.72.502, Tables A and/or B? ☐ Yes ☒ No		
4	Will this facility be a source of federal Hazardous Air Pollutants (HAP)? ☒ Yes ☐ No		
a	If Yes, what type of source? ☐ **Major** (☐ ≥10 tpy of any single HAP **OR** ☐ ≥25 tpy of any combination of HAPS) **OR** ☒ **Minor** (☒ <10 tpy of any single HAP **AND** ☒ <25 tpy of any combination of HAPS)		
5	Is any unit exempt under 20.2.72.202.B.3 NMAC? ☐ Yes ☒ No		
a	If yes, include the name of company providing commercial electric power to the facility: _____ Commercial power is purchased from a commercial utility company, which specifically does not include power generated on site for the sole purpose of the user.		

Section 1-G: Streamline Application (This section applies to 20.2.72.300 NMAC Streamline applications only)

1	☐ I have filled out Section 18, "Addendum for Streamline Applications."	☒ N/A (This is not a Streamline application.)

Section 1-H: Current Title V Information - Required for all applications from TV Sources

(Title V-source required information for all applications submitted pursuant to 20.2.72 NMAC (Minor Construction Permits), or 20.2.74/20.2.79 NMAC (Major PSD/NNSR applications), and/or 20.2.70 NMAC (Title V))

1	Responsible Official (R.O.) (20.2.70.300.D.2 NMAC): Michael LeBlanc		Phone: 985-575-8311
a	R.O. Title: SVP Operations	R.O. e-mail: Michael.LeBlanc@EnLink.com	
b	R. O. Address: 5609 Bayou Black Dr, Suite A, Gibson, LA 70356		
2	Alternate Responsible Official (20.2.70.300.D.2 NMAC): Manish Kumar		Phone: 432-221-9704
a	A. R.O. Title: Senior Director Operations	A. R.O. e-mail: Manish.Kumar@EnLink.com	
b	A. R. O. Address: 303 West Wall Street, Suite 202, Midland, TX 79701		
3	Company's Corporate or Partnership Relationship to any other Air Quality Permittee (List the names of any companies that have operating (20.2.70 NMAC) permits and with whom the applicant for this permit has a corporate or partnership relationship): N/A		
4	Name of Parent Company ("Parent Company" means the primary name of the organization that owns the company to be permitted wholly or in part.): Delaware G&P, LLC		
a	Address of Parent Company: 1722 Routh Street, Suite 1300, Dallas, TX 75201		
5	Names of Subsidiary Companies ("Subsidiary Companies" means organizations, branches, divisions or subsidiaries, which are owned, wholly or in part, by the company to be permitted.): N/A		
6	Telephone numbers & names of the owners' agents and site contacts familiar with plant operations: Lance Green 225-692-6947		
7	Affected Programs to include Other States, local air pollution control programs (i.e. Bernalillo) and Indian tribes: Will the property on which the facility is proposed to be constructed or operated be closer than 80 km (50 miles) from other states, local pollution control programs, and Indian tribes and pueblos (20.2.70.402.A.2 and 20.2.70.7.B)? If yes, state which ones and provide the distances in kilometers: Texas, 9.2 km		

Section 1-I – Submittal Requirements

Each 20.2.73 NMAC (**NOI**), a 20.2.70 NMAC (**Title V**), a 20.2.72 NMAC (**NSR** minor source), or 20.2.74 NMAC (**PSD**) application package shall consist of the following:

Hard Copy Submittal Requirements:

1) One hard copy **original signed and notarized application package** **printed double sided 'head-to-toe'** **2-hole punched** as we bind the document on top, not on the side; except Section 2 (landscape tables), which should be head-to-head. Please use **numbered tab separators** in the hard copy submittal(s) as this facilitates the review process. For NOI submittals only, hard copies of UA1, Tables 2A, 2D & 2F, Section 3 and the signed Certification Page are required. Please include a copy of the check on a separate page.

2) If the application is for a minor NSR, PSD, NNSR, or Title V application, include one working hard **copy** for Department use. This copy should be printed in book form, 3-hole punched, and **must be double sided**. Note that this is in addition to the head-to-to 2-hole punched copy required in 1) above. Minor NSR Technical Permit revisions (20.2.72.219.B NMAC) only need to fill out Sections 1-A, 1-B, 3, and should fill out those portions of other Section(s) relevant to the technical permit revision. TV Minor Modifications need only fill out Sections 1-A, 1-B, 1-H, 3, and those portions of other Section(s) relevant to the minor modification. NMED may require additional portions of the application to be submitted, as needed.

3) The entire NOI or Permit application package, including the full modeling study, should be submitted electronically. Electronic files for applications for NOIs, any type of General Construction Permit (GCP), or technical revisions to NSRs must be submitted with compact disk (CD) or digital versatile disc (DVD). For these permit application submittals, **two** CD copies are required (in sleeves, not crystal cases, please), with additional CD copies as specified below. NOI applications require only a single CD submittal. Electronic files for other New Source Review (construction) permits/permit modifications or Title V permits/permit modifications can be submitted on CD/DVD or sent through AQB's secure file transfer service.

Electronic files sent by (check one):

☐ CD/DVD attached to paper application

☒ Secure electronic transfer. Air Permit Contact Name Leslee Kimbrell, Email: LK@resolutecompliance.com Phone number 505-369-6572.

a. If the file transfer service is chosen by the applicant, after receipt of the application, the Bureau will email the applicant with instructions for submitting the electronic files through a secure file transfer service. Submission of the electronic files through the file transfer service needs to be completed within 3 business days after the invitation is received, so the applicant should ensure that the files are ready when sending the hard copy of the application. The applicant will not need a password to complete the transfer. **Do not use the file transfer service for NOIs, any type of GCP, or technical revisions to NSR permits.**

4) Optionally, the applicant may submit the files with the application on compact disk (CD) or digital versatile disc (DVD) following the instructions above and the instructions in 5 for applications subject to PSD review.

5) If **air dispersion modeling** is required by the application type, include the **NMED Modeling Waiver** and/or electronic air dispersion modeling report, input, and output files. The dispersion modeling ***summary report only*** should be submitted as hard copy(ies) unless otherwise indicated by the Bureau.

6) If the applicant submits the electronic files on CD and the application is subject to PSD review under 20.2.74 NMAC (PSD) or NNSR under 20.2.79 NMC include,
   a. one additional CD copy for US EPA,
   b. one additional CD copy for each federal land manager affected (NPS, USFS, FWS, USDI) and,
   c. one additional CD copy for each affected regulatory agency other than the Air Quality Bureau.

   If the application is submitted electronically through the secure file transfer service, these extra CDs do not need to be submitted.

Electronic Submittal Requirements [in addition to the required hard copy(ies)]:

1) All required electronic documents shall be submitted as 2 separate CDs or submitted through the AQB secure file transfer service. Submit a single PDF document of the entire application as submitted and the individual documents comprising the application.

2) The documents should also be submitted in Microsoft Office compatible file format (Word, Excel, etc.) allowing us to access the text and formulas in the documents (copy & paste). Any documents that cannot be submitted in a Microsoft Office compatible format shall be saved as a PDF file from within the electronic document that created the file. If you are unable to provide Microsoft office compatible electronic files or internally generated PDF files of files (items that were not created electronically: i.e. brochures, maps, graphics, etc,), submit these items in hard copy format. We must be able to review the formulas and inputs that calculated the emissions.

3) It is preferred that this application form be submitted as 4 electronic files (3 MSWord docs: Universal Application section 1 [UA1], Universal Application section 3-19 [UA3], and Universal Application 4, the modeling report [UA4]) and 1 Excel file of the tables (Universal Application section 2 [UA2]). Please include as many of the 3-19 Sections as practical in a single MS Word electronic document. Create separate electronic file(s) if a single file becomes too large or if portions must be saved in a file format other than MS Word.

4) The electronic file names shall be a maximum of 25 characters long (including spaces, if any). The format of the electronic Universal Application shall be in the format: "A-3423-FacilityName". The "A" distinguishes the file as an application submittal, as opposed to other documents the Department itself puts into the database. Thus, all electronic application submittals should begin with "A-". Modifications to existing facilities should use the core permit number (i.e. '3423') the Department assigned to the facility as the next 4 digits. Use 'XXXX' for new facility applications. The format of any separate electronic submittals (additional submittals such as non-Word attachments, re-submittals, application updates) and Section document shall be in the format: "A-3423-9-description", where "9" stands for the section # (in this case Section 9-Public Notice). Please refrain, as much as possible, from submitting any scanned documents as this file format is extremely large, which uses up too much storage capacity in our database. Please take the time to fill out the header information throughout all submittals as this will identify any loose pages, including the Application Date (date submitted) & Revision number (0 for original, 1, 2, etc.; which will help keep track of subsequent partial update(s) to the original submittal. Do not use special symbols (#, @, etc.) in file names. The footer information should not be modified by the applicant.

Table of Contents

Section 3

Application Summary

The **Application Summary** shall include a brief description of the facility and its process, the type of permit application, the applicable regulation (i.e. 20.2.72.200.A.X, or 20.2.73 NMAC) under which the application is being submitted, and any air quality permit numbers associated with this site. If this facility is to be collocated with another facility, provide details of the other facility including permit number(s). In case of a revision or modification to a facility, provide the lowest level regulatory citation (i.e. 20.2.72.219.B.1.d NMAC) under which the revision or modification is being requested. Also describe the proposed changes from the original permit, how the proposed modification will affect the facility's operations and emissions, de-bottlenecking impacts, and changes to the facility's major/minor status (both PSD & Title V).

The **Process Summary** shall include a brief description of the facility and its processes.

Startup, Shutdown, and Maintenance (SSM) routine or predictable emissions: Provide an overview of how SSM emissions are accounted for in this application. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.env.nm.gov/aqb/permit/app_form.html) for more detailed instructions on SSM emissions.

Delaware G&P, LLC (Delaware) is submitting an initial New Source Review (NSR) Permit under 20.2.72.200.A NMAC to replace GCP Permit 7868M5 to authorize the addition of two (2) compressor engine options (Source IDs E-9 and E-10) and increase facility throughput at the Horned Frog Compressor Station (Facility), located near Jal in Lea County, New Mexico. The Facility is a natural gas compressor station that receives natural gas from wells located in Lea County through a network of gathering pipelines.

The facility will consist of the following equipment:

- Nine (9) Compressor Engines (Unit IDs E-1, E-2, E-4 through E-10)
- Two (2) generator engines (Unit IDs GEN-4, GEN-5)
- Six (6) 400 bbl condensate tanks (Unit IDs TK-1 through TK-3, TK-5 through TK-7)
- Two (2) 400 bbl produced water tanks (Unit IDs TK-4, TK-8)
- One (1) 750 bbl gunbarrel separator (Unit ID GB-1)
- Two (2) glycol reboilers (Unit IDs H-1, H-2)
- Two (2) TEG dehydrators (Unit IDs DEHY1, DEHY2)
- One (1) enclosed combustor (Unit ID ECD-1)
- One (1) electric vapor recovery unit
- Condensate loading (Unit ID CONDLOAD)
- Produced water loading (Unit ID PWLOAD)
- Facility fugitives (Unit ID FUG)
- Unpaved haul road emissions (Unit ID UR-1)
- Startup, Shutdown, Maintenance emissions (Unit ID SSM)

Site-Specific SSM emissions are estimated for compressor blowdowns, starter vents, dehydrator blowdowns, filter coalescer blowdowns, scrubber blowdowns, pump blowdowns, reboiler maintenance, pipeline maintenance and tank degassing.

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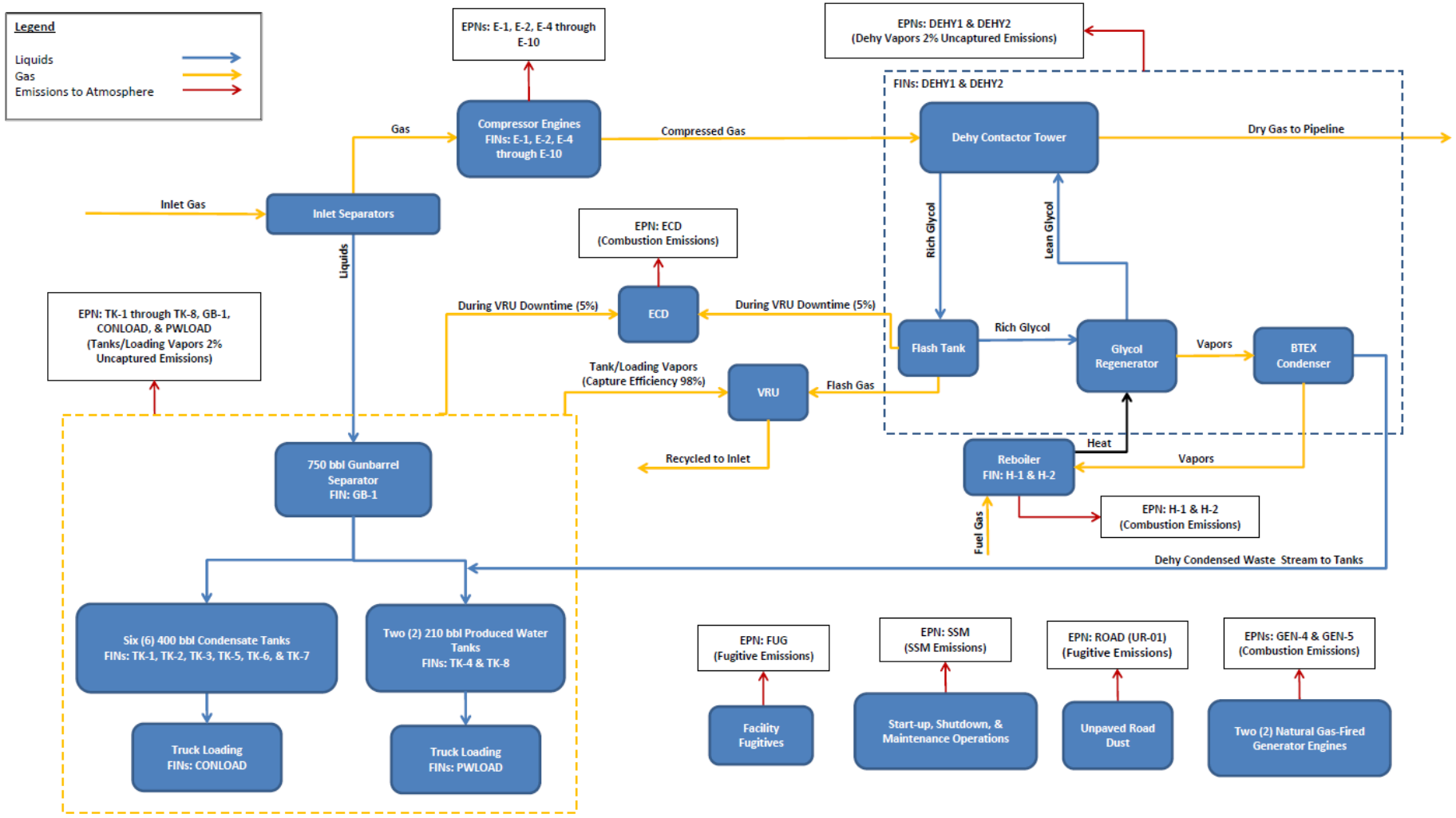
Section 4

Process Flow Sheet

A **process flow sheet** and/or block diagram indicating the individual equipment, all emission points and types of control applied to those points. The unit numbering system should be consistent throughout this application.

A process flow diagram is attached to this section.



RESOLUTE COMPLIANCE, LLC
Purposeful Solutions. Unwavering Service.

Delaware G & P, LLC
Horned Frog Compressor Station
Lea County, NM

Process Flow Diagram

Project No. Env-EnLink-Horned Frog
Report No. NSR-0254
Date: May 2024

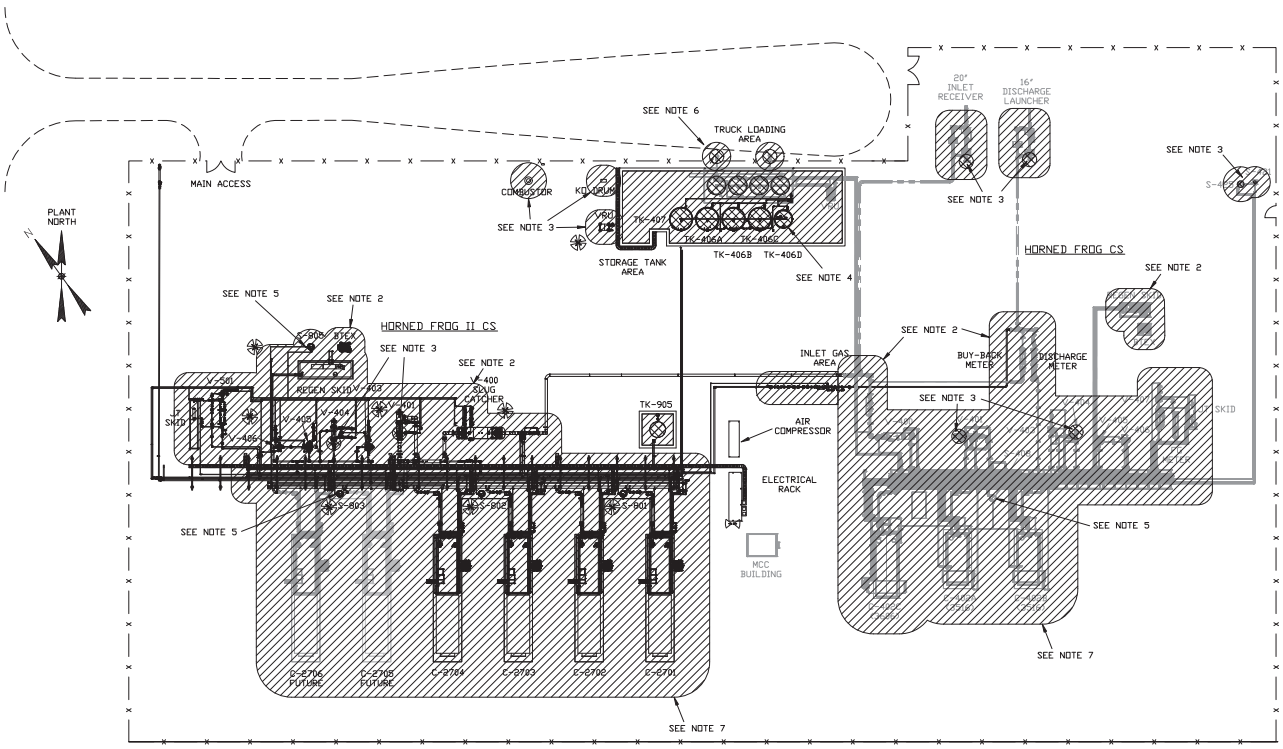
Figure 1

Section 5

Plot Plan Drawn to Scale

A **plot plan drawn to scale** showing emissions points, roads, structures, tanks, and fences of property owned, leased, or under direct control of the applicant. This plot plan must clearly designate the restricted area as defined in UA1, Section 1-D.12. The unit numbering system should be consistent throughout this application.

A plot plan is attached to this section.



NOTES

1. AREA CLASS PER API RP 500, AND NFPA 70E, ARTICLE 500.
2. THE AREA AROUND PROCESSING EQUIPMENT, VALVES AND FLANGES IS CLASS 1 DIVISION 2 FOR A 10' RADIUS
3. THE AREA AROUND RELIEF VALVES, VENTS AND RECEIVERS IS CLASS 1 DIVISION 1 FOR A 5' RADIUS AND CLASS 1 DIVISION 2 FOR A 10' RADIUS
4. THE AREA AROUND COMBUSTIBLE LIQUID STORAGE TANKS IS CLASS 1 DIVISION 1 TO THE EXTENTS OF THE TANK WALL, CLASS 1 DIVISION 1 FOR A 5' RADIUS AROUND VENTS, AND CLASS 1 DIVISION 2 FOR A 10' RADIUS AROUND THE TANK. ELECTRICAL INSTALLATIONS IN THIS AREA MUST BE RATED FOR THE AREA, AND ALL FLEX CONDUIT MUST BE EXPLOSION-PROOF
5. THE AREA AROUND SUMP TANKS IS CLASS 1 DIVISION 1 TO THE EXTENTS OF THE TANK BELOW GRADE AND CLASS 1 DIVISION 2 FOR A 10' RADIUS. ELECTRICAL INSTALLATIONS IN THIS AREA MUST BE RATED FOR THE AREA, AND ALL FLEX CONDUIT MUST BE EXPLOSION-PROOF.
6. THE AREA AROUND TANK TRUCK LOADING IS CLASS 1 DIVISION 1 FOR A 5' RADIUS AROUND CONNECTION POINT, AND CLASS 1 DIVISION 2 FOR A 10' RADIUS.
7. THE AREA AROUND GAS COMPRESSORS OPERATING AT 275 PSIG AND ABOVE IS CLASS 1 DIVISION 2 FOR A 25' RADIUS.

0' 12'-0" 24'-0" 48'-0" 72'-0" 96'-0"
1/32" = 1'-0"

REFERENCE DRAWINGS	
DWG. NO.	TITLE

REVISIONS		
NO.	DATE	DESCRIPTION
A	06/23/23	ISSUED FOR REVIEW
B	07/21/23	ISSUED FOR BID
1	02/02/24	AS BUILT

CONFIDENTIAL
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DRAWING RECORD		
DRAWN:	KN	DATE: 06/14/23
CHECKED:	JC	DATE: 07/21/23
APPROVED:	DS	DATE: 07/21/23
AFE:		
SCALE:	1/32" = 1'-0"	

NEXGRADE ENGINEERING, LLC

ENLINK MIDSTREAM

TITLE
HORNED FROG II CS
SITE PLAN
AREA CLASSIFICATION LAYOUT
LEA CO. NM

DWG. NO. D-14397-EP-132.01

REV. 1

Section 6

All Calculations

Show all calculations used to determine both the hourly and annual controlled and uncontrolled emission rates. All calculations shall be performed keeping a minimum of three significant figures. Document the source of each emission factor used (if an emission rate is carried forward and not revised, then a statement to that effect is required). If identical units are being permitted and will be subject to the same operating conditions, submit calculations for only one unit and a note specifying what other units to which the calculations apply. All formulas and calculations used to calculate emissions must be submitted. The "Calculations" tab in the UA2 has been provided to allow calculations to be linked to the emissions tables. Add additional "Calc" tabs as needed. If the UA2 or other spread sheets are used, all calculation spread sheet(s) shall be submitted electronically in Microsoft Excel compatible format so that formulas and input values can be checked. Format all spread sheets and calculations such that the reviewer can follow the logic and verify the input values. Define all variables. If calculation spread sheets are not used, provide the original formulas with defined variables. Additionally, provide subsequent formulas showing the input values for each variable in the formula. All calculations, including those calculations are imbedded in the Calc tab of the UA2 portion of the application, the printed Calc tab(s), should be submitted under this section.

Tank Flashing Calculations: The information provided to the AQB shall include a discussion of the method used to estimate tank-flashing emissions, relative thresholds (i.e., NOI, permit, or major source (NSPS, PSD or Title V)), accuracy of the model, the input and output from simulation models and software, all calculations, documentation of any assumptions used, descriptions of sampling methods and conditions, copies of any lab sample analysis. If Hysis is used, all relevant input parameters shall be reported, including separator pressure, gas throughput, and all other relevant parameters necessary for flashing calculation.

SSM Calculations: It is the applicant's responsibility to provide an estimate of SSM emissions or to provide justification for not doing so. In this Section, provide emissions calculations for Startup, Shutdown, and Routine Maintenance (SSM) emissions listed in the Section 2 SSM and/or Section 22 GHG Tables and the rational for why the others are reported as zero (or left blank in the SSM/GHG Tables). Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.env.nm.gov/aqb/permit/app_form.html) for more detailed instructions on calculating SSM emissions. If SSM emissions are greater than those reported in the Section 2, Requested Allowables Table, modeling may be required to ensure compliance with the standards whether the application is NSR or Title V. Refer to the Modeling Section of this application for more guidance on modeling requirements.

Glycol Dehydrator Calculations: The information provided to the AQB shall include the manufacturer's maximum design recirculation rate for the glycol pump. If GRI-Glycalc is used, the full input summary report shall be included as well as a copy of the gas analysis that was used.

Road Calculations: Calculate fugitive particulate emissions and enter haul road fugitives in Tables 2-A, 2-D and 2-E for:

1. If you transport raw material, process material and/or product into or out of or within the facility and have PER emissions greater than 0.5 tpy.
2. If you transport raw material, process material and/or product into or out of the facility more frequently than one round trip per day.

Significant Figures:

A. All emissions standards are deemed to have at least two significant figures, but not more than three significant figures.

B. At least 5 significant figures shall be retained in all intermediate calculations.

C. In calculating emissions to determine compliance with an emission standard, the following rounding off procedures shall be used:

(1) If the first digit to be discarded is less than the number 5, the last digit retained shall not be changed;

(2) If the first digit discarded is greater than the number 5, or if it is the number 5 followed by at least one digit other than the number zero, the last figure retained shall be increased by one unit; **and**

(3) If the first digit discarded is exactly the number 5, followed only by zeros, the last digit retained shall be rounded upward if it is an odd number, but no adjustment shall be made if it is an even number.

(4) The final result of the calculation shall be expressed in the units of the standard.

Control Devices: In accordance with 20.2.72.203.A(3) and (8) NMAC, 20.2.70.300.D(5)(b) and (e) NMAC, and 20.2.73.200.B(7) NMAC, the permittee shall report all control devices and list each pollutant controlled by the control device regardless if the applicant takes credit for the reduction in emissions. The applicant can indicate in this section of the application if they chose to not take credit for the reduction in emission rates. For notices of intent submitted under 20.2.73 NMAC, only uncontrolled emission rates can be considered to determine applicability unless the state or federal Acts require the control. This information is necessary to determine if federally enforceable conditions are necessary for the control device, and/or if the control device produces its own regulated pollutants or increases emission rates of other pollutants.

Caterpillar 3516B Engines (Unit IDs: E-1 and E-2)
NO_X, CO, and VOC emission rates were calculated using manufacturer specifications. SO_2 emissions are based on a conservative fuel sulfur content estimated of 2 gr S/100 scf and 100% conversion of elemental sulfur to SO_2. Particulate ($PM_{2.5}$, PM_{10}, and PM) and HAP emissions were calculated using AP-42 Table 3.2-2. Greenhouse gas emissions are estimated using emission factors from 40 CFR 98 Subpart C Tables C-1 and C-2.

Caterpillar 3606 A4 Engine (Unit ID: E-4)
NO_X, CO, and VOC emission rates were calculated using manufacturer specifications. SO_2 emissions are based on a conservative fuel sulfur content estimated of 2 gr S/100 scf and 100% conversion of elemental sulfur to SO_2. Particulate ($PM_{2.5}$, PM_{10}, and PM) and HAP emissions were calculated using AP-42 Table 3.2-2. Greenhouse gas emissions are estimated using emission factors from 40 CFR 98 Subpart C Tables C-1 and C-2.

Waukesha P9394GSI S5 Engines (Unit IDs: E-5, E-6, ENG-7, E-8, E-9b)
NO_X, CO, and VOC emission rates were calculated using manufacturer specifications. SO_2 emissions are based on a conservative fuel sulfur content estimated of 2 gr S/100 scf and 100% conversion of elemental sulfur to SO_2. Particulate ($PM_{2.5}$, PM_{10}, and PM) and HAP emissions were calculated using AP-42 Table 3.2-2. Greenhouse gas emissions are estimated using emission factors from 40 CFR 98 Subpart C Tables C-1 and C-2.

Caterpillar 3608 A4 Engine (Unit ID: E-9a)
NO_X, CO, and VOC emission rates were calculated using manufacturer specifications. SO_2 emissions are based on a conservative fuel sulfur content estimated of 2 gr S/100 scf and 100% conversion of elemental sulfur to SO_2. Particulate ($PM_{2.5}$, PM_{10}, and PM) and HAP emissions were calculated using AP-42 Table 3.2-2. Greenhouse gas emissions are estimated using emission factors from 40 CFR 98 Subpart C Tables C-1 and C-2.

Caterpillar 3612 A4 Engine (Unit ID: E-10a)
NO_X, CO, and VOC emission rates were calculated using manufacturer specifications. SO_2 emissions are based on a conservative fuel sulfur content estimated of 2 gr S/100 scf and 100% conversion of elemental sulfur to SO_2. Particulate ($PM_{2.5}$, PM_{10}, and PM) and HAP emissions were calculated using AP-42 Table 3.2-2. Greenhouse gas emissions are estimated using emission factors from 40 CFR 98 Subpart C Tables C-1 and C-2.

Waukesha 12V275GL Engine (Unit ID: E-10b)
NO_X, CO, and VOC emission rates were calculated using manufacturer specifications. SO_2 emissions are based on a conservative fuel sulfur content estimated of 2 gr S/100 scf and 100% conversion of elemental sulfur to SO_2. Particulate ($PM_{2.5}$, PM_{10}, and PM) and HAP emissions were calculated using AP-42 Table 3.2-2. Greenhouse gas emissions are estimated using emission factors from 40 CFR 98 Subpart C Tables C-1 and C-2.

Glycol Dehydrators (Unit IDs: DEHY1, DEHY2)
Glycol dehydrator emissions were calculated using BR&E Promax and an extended gas analysis. Flash tank emissions are sent to a VRU with 98% capture efficiency, routed to station suction, during VRU downtime emissions are sent to the ECD for 98% DRE; still column to BTEX, BTEX non-condensable is sent to reboiler stack with glow plug with 98% DRE.

Gunbarrel Separator (Unit ID: GB-1)
Gunbarrel emissions were estimated using BR&E ProMax. Flash, working and standing emissions are controlled by a VRU with an assumed 98% capture efficiency and 5% downtime. Downtime is sent to ECD with 98% DRE.

Storage Tanks (Unit IDs: TK-1 through TK-8)
Condensate storage tanks (Unit IDs: TK-1,2,3 and TK-5,6,7) and produced water tanks (Unit IDs: TK-4 and TK-8) emissions were estimated using BR&E ProMax. Flash, working and standing emissions from these tanks are controlled by a VRU with an assumed 98% capture efficiency and 5% downtime. Downtime is sent to ECD with 98% DRE.

Enclosed Combustor Devices (Unit IDs: ECD-1)
NO_X and CO emissions were calculated using TNRCC RG-109. VOCs and HAPs emissions were estimated based on the gas analysis and with manufacturer specification of 98% combustion efficiency. Pilot SO_2 emissions are based on a conservative fuel sulfur content estimated of 2 gr S/100 scf and 100% conversion of elemental sulfur to SO_2. Process emissions were calculated assuming 98% combustion efficiency. Greenhouse gas emissions are estimated using emission factors from 40 CFR Part 98 Subpart C Table C-01 and C-02.

Fugitive Emissions (Unit ID: FUG)
Fugitive emission calculations were completed using emission factors from Table 2-4 of EPA Protocol for Equipment Leak Emission Estimates, 1995, and weight percent of gas and liquid components from gas and liquid streams generated in a BR&E ProMax simulation. Subcomponent counts for each subcomponent are based on estimated average component counts for each piece of equipment.

Loading Emissions (Unit ID: CONDLOAD and PWLOAD)
ProMax was used to perform the loading emission for condensate and produced water.

Reboilers (Unit IDs: H-1 and H-2)
NO_X, CO, VOCs and PM were estimated using AP-42 Table 1.4-1 & 1.4-2 with adjusted emission factors. HAPs were calculated using adjusted emission rates from AP-42 Table 1.4-3. SO_2 emissions were calculated with a conservative assumption of 2 gr S/100 scf and 100% conversion of elemental sulfur to SO_2. Greenhouse gas emissions are estimated using emission factors from 40 CFR Part 98 Subpart C Table C-01 and C-02.

Unpaved Haul Road (Unit ID: UR-1)
PM, PM_{10} and $PM_{2.5}$ emissions were estimated based on the condensate loadout design basis and using equations 1a & 2 from AP-42 Section 13.2.2. Emissions factors were used from AP-42 Table 13.2.2-2.

Allowable Emission Summary
New Source Review Permit
Horned Frog Compressor Station
Delaware G & P, LLC

1 metric ton= 1.10231 short ton

			NOx		CO		VOC		SO2		PM		PM10		PM2.5		H2S		Acetaldehyde		Acrolein		Benzene		Formaldehyde		Total HAPs		GHG short tons			
FIN	EPN	Description	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	CO_2	N_2O	CH_4	CO_2e
																													tpy	tpy	tpy	tpy
E-1	E-1	1380 hp Caterpillar Compressor Engine	1.67	7.33	1.89	8.26	1.76	7.73	0.06	0.26	0.11	0.50	0.11	0.50	0.11	0.50	-	-	0.095	0.415	0.058	0.255	0.005	0.022	0.26	1.15	0.43	1.87	6398.84	0.01	0.12	6405.45
E-2	E-2	1380 hp Caterpillar Compressor Engine	1.67	7.33	1.89	8.26	1.76	7.73	0.06	0.26	0.11	0.50	0.11	0.50	0.11	0.50	-	-	0.095	0.415	0.058	0.255	0.005	0.022	0.26	1.15	0.43	1.87	6398.84	0.01	0.12	6405.45
E-4	E-4	1875 hp Caterpillar Compressor Engine	2.07	9.05	2.07	9.05	1.24	5.43	0.06	0.28	0.12	0.55	0.12	0.55	0.12	0.55	-	-	0.104	0.456	0.064	0.281	0.005	0.024	0.08	0.36	0.26	1.16	7041.03	0.01	0.13	7048.31
E-5	E-5	2500 hp Waukesha Compressor Engine	1.65	7.24	2.20	9.66	1.38	6.04	0.09	0.39	0.34	1.48	0.34	1.48	0.34	1.48	-	-	0.049	0.213	0.046	0.201	0.028	0.121	0.22	0.97	0.36	1.56	9846.93	0.02	0.19	9857.10
E-6	E-6	2500 hp Waukesha Compressor Engine	1.65	7.24	2.20	9.66	1.38	6.04	0.09	0.39	0.34	1.48	0.34	1.48	0.34	1.48	-	-	0.049	0.213	0.046	0.201	0.028	0.121	0.22	0.97	0.36	1.56	9846.93	0.02	0.19	9857.10
E-7	E-7	2500 hp Waukesha Compressor Engine	1.65	7.24	2.20	9.66	1.38	6.04	0.09	0.39	0.34	1.48	0.34	1.48	0.34	1.48	-	-	0.049	0.213	0.046	0.201	0.028	0.121	0.22	0.97	0.36	1.56	9846.93	0.02	0.19	9857.10
E-8	E-8	2500 hp Waukesha Compressor Engine	1.65	7.24	2.20	9.66	1.38	6.04	0.09	0.39	0.34	1.48	0.34	1.48	0.34	1.48	-	-	0.049	0.213	0.046	0.201	0.028	0.121	0.22	0.97	0.36	1.56	9846.93	0.02	0.19	9857.10
E-9*	E-9*	2500 hp Compressor Engine	1.65	7.24	2.20	9.66	1.65	7.24	0.10	0.43	0.34	1.48	0.34	1.48	0.34	1.48	-	-	0.159	0.695	0.098	0.428	0.028	0.121	0.22	0.97	0.50	2.18	10725.16	0.02	0.20	10736.24
E-10*	E-10*	3750 hp Compressor Engine	2.48	10.86	2.48	10.86	2.08	9.13	0.15	0.64	0.28	1.24	0.28	1.24	0.28	1.24	-	-	0.236	1.036	0.145	0.637	0.012	0.055	0.25	1.09	0.66	2.89	15975.49	0.03	0.30	15991.99
GEN-4	GEN-4	536 hp Generator Engine	1.18	5.18	2.36	10.35	0.91	4.01	0.022	0.097	0.08	0.36	0.08	0.36	0.08	0.36	-	-	0.012	0.052	0.011	0.049	0.007	0.030	0.09	0.39	0.12	0.53	2421.77	0.00	0.05	2424.28
GEN-5	GEN-5	536 hp Generator Engine	1.18	5.18	2.36	10.35	0.91	4.01	0.022	0.097	0.08	0.36	0.08	0.36	0.08	0.36	-	-	0.012	0.052	0.011	0.049	0.007	0.030	0.09	0.39	0.12	0.53	2421.77	0.00	0.05	2424.28
TK-1	VRU/ECD	400 bbl Condensate Tank	-	-	-	-	0.49	1.14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.53
TK-2	VRU/ECD	400 bbl Condensate Tank	-	-	-	-	0.49	1.14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.53
TK-3	VRU/ECD	400 bbl Condensate Tank	-	-	-	-	0.49	1.14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.53
TK-4	VRU/ECD	400 bbl Produced Water Tank	-	-	-	-	0.001	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.001	0.02
TK-5	VRU/ECD	400 bbl Condensate Tank	-	-	-	-	0.49	1.14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.53
TK-6	VRU/ECD	400 bbl Condensate Tank	-	-	-	-	0.49	1.14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.53
TK-7	VRU/ECD	400 bbl Condensate Tank	-	-	-	-	0.49	1.14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.53
TK-8	VRU/ECD	400 bbl Produced Water Tank	-	-	-	-	0.001	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0006	0.02
GB-01	VRU/ECD	750 bblGunbarrel Separator	-	-	-	-	4.03	9.36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.13	3.31
H-1	H-1	0.5 MMBtu/hr Reboiler	0.05	0.20	0.04	0.17	0.00	0.01	0.003	0.011	0.00	0.01	0.00	0.01	0.00	0.01	-	-	-	-	-	-	-	-	-	-	-	-	282.39	0.0005	0.005	282.68
H-2	H-2	1 MMBtu/hr Reboiler	0.09	0.39	0.08	0.33	0.00	0.02	0.005	0.023	0.01	0.03	0.01	0.03	0.01	0.03	-	-	-	-	-	-	-	-	-	-	-	-	564.78	0.0011	0.011	565.36
DEHY1	VRU/ECD	25 MMSCFD Glycol Dehydrator	-	-	-	-	1.54	4.34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.040	0.150	-	-	0.13	0.57	301.30	-	1.47	338.03
DEHY2	VRU/ECD	100 MSCFD Glycol Dehydrator	-	-	-	-	1.54	4.30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.040	0.160	-	-	0.13	0.59	290.86	-	1.62	331.24
CONDLOAD	VRU/ECD	Condensate Truck Loading	-	-	-	-	0.09	0.20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	0.04
PWLOAD	VRU/ECD	Produced Water Truck Loading	-	-	-	-	6.5E-06	1.5E-05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00005	0.00
VRU	ECD	Enlosed Combustion Device	0.85	0.26	0.43	0.13	0.0002	0.0007	0.0003	0.0015	-	-	-	-	-	-	-	-	-	-	-	-	6.3E-08	2.8E-07	-	-	-	-	202681.67	0.38	3.82	202890.99
FUG	FUG	Fugitives	-	-	-	-	3.50	15.32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.008	0.036	-	-	0.21	0.93	0.58	-	16.28	407.51
UR-1	UR-1	Unpaved Haul Roads	-	-	-	-	-	-	-	-	0.63	0.31	0.63	0.31	0.06	0.03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SSM	SSM	Startup, Shutdown, Maintenance	-	-	-	-	1737.98	18.27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.56	0.06	-	-	47.65	0.50	1.10	-	31.00	776.18
		Total	**19.51**	**81.98**	**24.61**	**106.05**	**1767.50**	**128.10**	**0.83**	**3.66**	**3.13**	**11.27**	**3.13**	**11.27**	**2.57**	**10.99**	**0.00**	**0.00**	**0.91**	**3.97**	**0.63**	**2.76**	**5.83**	**1.19**	**2.13**	**9.34**	**52.07**	**19.86**	**294,893.30**	**0.55**	**56.17**	**296,462.90**
		Total minus fugitives					**1764.00**	**112.78**																								

*Represents worst-case scenario between both engine options.

Manley Gas Analysis C6+ Speciation Calculator
New Source Review Permit
Horned Frog Compressor Station
Delaware G&P LLC

Component			Sample Mol %	MW	Mol%xMW	Wt%
Water			0.0000%	18.015	0.0000	0.000%
Nitrogen			1.6257%	28.013	0.4554	1.936%
CO2			0.9110%	44.010	0.4009	1.704%
Oxygen			0.0000%	31.999	0.0000	0.000%
H2S			0.0000%	34.081	0.0000	0.000%
Methane			70.5411%	16.043	11.3169	48.103%
Ethane			13.3016%	30.070	3.9998	17.001%
Propane			7.6090%	44.097	3.3553	14.262%
i-Butane (iC4)	*Total C4*	*3.7352%*	1.0390%	58.123	0.6039	2.567%
n-Butane (nC4)			2.6962%	58.123	1.5671	6.661%
i-Pentane(iC5)	*Total C5*	*1.3098%*	0.6014%	72.150	0.4339	1.844%
n-Pentane(nC5)			0.7084%	72.150	0.5111	2.173%
Hexanes	*Total C6+*	*0.9666%*	*0.6864%*			
Heptanes			*0.2802%*			
		Sample Sum	***100%***			

	C6+ Normalized Sample Mol%	% of Norm. Sample - Adjusted for C6 and C7+ Split	Corrected Mol %	MW	Mol%xMW	Corrected Wt%
Benzene	2.055%	3.4372	0.0236%	78.000	0.0184	0.078%
n-Hexane	16.993%	28.4226	0.1951%	86.172	0.1681	0.715%
Hexane (C6)	40.739%	68.1402	0.4677%	86.172	0.4030	1.713%
Toluene	1.771%	4.4040	0.0123%	92.130	0.0114	0.048%
Heptane (C7)	29.283%	72.8197	0.2040%	100.198	0.2044	0.869%
Ethylbenzene	0.060%	0.1492	0.0004%	106.165	0.0004	0.002%
m-Xylene	0.339%	0.8430	0.0024%	106.165	0.0025	0.011%
p-Xylene	0.022%	0.0547	0.0002%	106.165	0.0002	0.001%
o-Xylene	0.082%	0.2039	0.0006%	106.165	0.0006	0.003%
Octane (C8)	5.961%	14.8236	0.0415%	114.224	0.0474	0.202%
Nonane (C9)	1.507%	3.7475	0.0105%	128.250	0.0135	0.057%
Decane	1.148%	2.8548	0.0080%	142.290	0.0114	0.048%
C11	0.040%	0.0995	0.0003%	156.310	0.0004	0.002%
C6+ Sum:	*100.00%*		*0.9666%*	***Gas MW***	***23.526***	
Totals			**100.00%**			**100.00%**
VOCs						**31.26%**
Max Benzene						**0.10%**
Total HAP						**0.857%**

Lower heating value	1335 Btu/scf	**Specific gravity**	0.8096
Higher heating value	1364 Btuscf		0.8162

SCADA Fuel Chromatograph
New Source Review Permit
Horned Frog Compressor Station
Delaware G&P LLC

Component			**Sample Mol %**	MW	Mol%xMW	**Wt%**
Water			0.0000%	18.015	0.0000	0.000%
Nitrogen			2.0020%	28.013	0.5608	2.853%
CO2			1.4630%	44.010	0.6439	3.276%
Oxygen			0.0000%	31.999	0.0000	0.000%
H2S			0.0000%	34.081	0.0000	0.000%
Methane			80.6860%	16.043	12.9445	65.859%
Ethane			11.8240%	30.070	3.5555	18.090%
Propane			3.4100%	44.097	1.5037	7.651%
i-Butane (iC4)	*Total C4*	*0.5530%*	0.3350%	58.123	0.1947	0.991%
n-Butane (nC4)			0.2180%	58.123	0.1267	0.645%
i-Pentane(iC5)	*Total C5*	*0.0480%*	0.0260%	72.150	0.0188	0.095%
n-Pentane(nC5)			0.0220%	72.150	0.0159	0.081%
Hexanes	*Total C6+*	*0.1030%*	*0.1000%*	86.172	0.0862	0.438%
Heptanes			*0.0030%*	100.198	0.0030	0.015%
Octane (C8)			*0.0010%*	114.224	0.0011	0.006%
				Gas MW	***19.655***	
Totals			**100%**			**100.00%**
VOCs						**9.92%**
Max Benzene						**0.10%**
Total HAP						**0.438%**

Fuel heating value 1111 Btu/scf **Specific gravity** 0.6776

Manley Liquid Analysis C6+ Speciation Calculator
New Source Review Permit
Horned Frog Compressor Station
Delaware G&P LLC

Component		Sample Mol %	Sample Wt%	
Water		0.00%	0.00%	
Nitrogen		0.00%	0.00%	
CO2		0.00%	0.00%	
Oxygen		0.00%	0.00%	
H2S		0.00%	0.00%	
Methane		0.11%	0.02%	
Ethane		0.27%	0.09%	
Propane		1.72%	0.85%	
i-Butane (iC4)	*Total C4*	1.41%	0.92%	
n-Butane (nC4)	*8.9500%*	7.54%	4.91%	
i-Pentane(iC5)	*Total C5*	7.10%	5.74%	
n-Pentane(nC5)	*19.1100%*	12.01%	9.71%	
Hexanes	*Total C6+*	*69.84%*	*77.76%*	
		100%	***100%***	

	C6+ Normalized Sample Mol%	**Corrected Mol %**	C6+ Normalized Sample Wt%	**Corrected Wt%**
Benzene	1.54%	1.08%	1.2100%	0.9409%
n-Hexane	11.84%	8.27%	10.2900%	8.0015%
Hexane (C6)	26.93%	18.81%	22.9100%	17.8148%
Toluene	3.06%	2.14%	3.0600%	2.3795%
Heptane (C7)	29.05%	20.29%	28.7800%	22.3793%
Ethylbenzene	0.26%	0.18%	0.2600%	0.2022%
m-Xylene	1.47%	1.03%	1.4700%	1.1431%
p-Xylene	0.37%	0.26%	0.3700%	0.2877%
o-Xylene	0.14%	0.10%	0.1400%	0.1089%
Octane (C8)	14.15%	9.88%	16.3200%	12.6904%
Nonane (C9)	4.87%	3.40%	6.1700%	4.7978%
Decane	6.16%	4.30%	8.7400%	6.7962%
C11	0.16%	0.11%	0.2800%	0.2177%
C6+ Sum:	*100.00%*	69.84%	**100.00%**	77.76%
Totals		**100.00%**		**100.00%**
VOCs				**99.89%**
Max Benzene				**0.10%**
Total HAP				**13.064%**

Worst-Case Emissions for Engine Options
New Source Review Permit
Horned Frog Compressor Station
Delaware G&P, LLC

Engine 9: Uncontrolled

Unit #	Description	NOx		CO		VOC		SO2		PM		PM10		PM2.5		H_2S		Acetaldehyde		Acrolein		Benzene		Formaldehyde		Total HAPs	
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	ton/yr	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
E-9a	Caterpillar G3608 A4	1.65	7.24	12.40	54.32	2.31	10.14	0.10	0.43	0.19	0.83	0.19	0.83	0.19	0.83	-	-	0.159	0.695	0.098	0.428	0.008	0.037	0.66	2.90	0.94	4.11
E-9b	Waukesha P9394GSI S5	65.97	288.96	33.40	146.29	3.31	14.48	0.09	0.39	0.34	1.48	0.34	1.48	0.34	1.48	-	-	0.049	0.213	0.046	0.201	0.028	0.121	0.28	1.21	0.41	1.80
E-9*	**Worst Case Emissions**	**65.97**	**288.96**	**33.40**	**146.29**	**3.31**	**14.48**	**0.10**	**0.43**	**0.34**	**1.48**	**0.34**	**1.48**	**0.34**	**1.48**			**0.16**	**0.70**	**0.10**	**0.43**	**0.03**	**0.12**	**0.66**	**2.90**	**0.94**	**4.11**

Engine 9: Controlled

Unit #	Description	NOx		CO		VOC		SO2		PM		PM10		PM2.5		H_2S		Acetaldehyde		Acrolein		Benzene		Formaldehyde		Total HAPs	
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	ton/yr	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
E-9a	Caterpillar G3608 A4	1.65	7.24	2.20	9.66	1.65	7.24	0.10	0.43	0.19	0.83	0.19	0.83	0.19	0.83	-	-	0.159	0.695	0.098	0.428	0.008	0.037	0.22	0.97	0.50	2.18
E-9b	Waukesha P9394GSI S5	1.65	7.24	2.20	9.66	1.38	6.04	0.09	0.39	0.34	1.48	0.34	1.48	0.34	1.48	-	-	0.049	0.213	0.046	0.201	0.028	0.121	0.22	0.97	0.36	1.56
E-9*	**Worst Case Emissions**	**1.65**	**7.24**	**2.20**	**9.66**	**1.65**	**7.24**	**0.10**	**0.43**	**0.34**	**1.48**	**0.34**	**1.48**	**0.34**	**1.48**			**0.16**	**0.70**	**0.10**	**0.43**	**0.03**	**0.12**	**0.22**	**0.97**	**0.50**	**2.18**

Engine 9: Greenhouse Gases

Unit #	Description		**CO_2** ton/yr	**N_2O** ton/yr	**CH_4** ton/yr	**Total GHG** Mass Basis ton/yr	**Total CO_2e** ton/yr	
		GWPs [1]	**1**	**298**	**25**			
E-9a	Caterpillar G3608 A4	**mass GHG**	9729.71	0.02	0.18	9729.92		
		CO_2e	9729.71	5.46	4.58		9739.76	
E-9b	Waukesha P9394GSI S5	**mass GHG**	8932.99	0.0168	0.17	8933.18		E-9b was approved in the GCP issued 4/25/2024
		CO_2e	8932.99	5.02	4.21		8942.22	
E-9*	**Worst Case Emissions**	**mass GHG**	**9729.71**	**0.02**	**0.18**	**9729.92**		
		CO_2e	**9729.71**	**5.46**	**4.58**		**9739.76**	

Engine 10: Uncontrolled

Unit #	Description	NOx		CO		VOC		SO2		PM		PM10		PM2.5		H_2S		Acetaldehyde		Acrolein		Benzene		Formaldehyde		Total HAPs	
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	ton/yr	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
E-10a	Caterpillar G3612 A4	2.48	10.86	24.39	106.82	6.04	26.43	0.15	0.64	0.28	1.24	0.28	1.24	0.28	1.24	-	-	0.236	1.036	0.145	0.637	0.012	0.055	1.57	6.88	1.98	8.69
E-10b	Waukesha 12V275GL	2.48	10.86	19.84	86.91	4.17	18.25	0.13	0.57	0.25	1.12	0.25	1.12	0.25	1.12	-	-	0.213	0.934	0.131	0.575	0.011	0.049	0.41	1.81	0.79	3.44
E-10*	**Worst Case Emissions**	**2.48**	**10.86**	**24.39**	**106.82**	**6.04**	**26.43**	**0.15**	**0.64**	**0.28**	**1.24**	**0.28**	**1.24**	**0.28**	**1.24**			**0.24**	**1.04**	**0.15**	**0.64**	**0.01**	**0.05**	**1.57**	**6.88**	**1.98**	**8.69**

Engine 10: Controlled

Unit #	Description	NOx		CO		VOC		SO2		PM		PM10		PM2.5		H_2S		Acetaldehyde		Acrolein		Benzene		Formaldehyde		Total HAPs	
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	ton/yr	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
E-10a	Caterpillar G3612 A4	2.48	10.86	2.48	10.86	2.07	9.05	0.15	0.64	0.28	1.24	0.28	1.24	0.28	1.24	-	-	0.236	1.036	0.145	0.637	0.012	0.055	0.25	1.09	0.66	2.89
E-10b	Waukesha 12V275GL	2.48	10.86	1.39	6.08	2.08	9.13	0.13	0.57	0.25	1.12	0.25	1.12	0.25	1.12	-	-	0.213	0.934	0.131	0.575	0.011	0.049	0.08	0.36	0.45	1.99
E-10*	**Worst Case Emissions**	**2.48**	**10.86**	**2.48**	**10.86**	**2.08**	**9.13**	**0.15**	**0.64**	**0.28**	**1.24**	**0.28**	**1.24**	**0.28**	**1.24**			**0.24**	**1.04**	**0.15**	**0.64**	**0.01**	**0.05**	**0.25**	**1.09**	**0.66**	**2.89**

Engine 10: Greenhouse Gases

Unit #	Description		**CO_2** ton/yr	**N_2O** ton/yr	**CH_4** ton/yr	**Total GHG** Mass Basis ton/yr[4]	**Total CO_2e** ton/yr[5]
		GWPs [1]	**1**	**298**	**25**		
E-10a	Caterpillar G3612 A4	**mass GHG**	14492.74	0.03	0.27	14493.04	
		CO_2e	14492.74	8.14	6.83		14507.71
E-10b	Waukesha 12V275GL	**mass GHG**	13074.78	0.02	0.25	13075.05	
		CO_2e	13074.78	7.34	6.16		13088.29
E-10*	**Worst Case Emissions**	**mass GHG**	**14492.74**	**0.03**	**0.27**	**14493.04**	
		CO_2e	**14492.74**	**8.14**	**6.83**		**14507.71**

Compressor Engines
New Source Review Permit
Horned Frog Compressor Station
Delaware G&P, LLC

Unit:	**E-1, E-2**		
Model: 4SLB	Caterpillar G3516B		
	1380	hp	Mfg. specs
Fuel Consumption:	8210	Btu/hp-hr	Mfg. specs
Fuel Heating Value:	1111.00	Btu/scf	Facility Specific
Daily Fuel Usage:	244748	scf/day	Calculated
Hourly Fuel Usage:	10198	scf/hr	Calculated
Annual Fuel Usage:	89.33	MMscf/yr	Calculated

Uncontrolled Emissions

	NO_x[1]	CO[1]	VOC[1]	SO_2[2]	PM[3]	Formaldehyde[1]	Acetaldehyde[4]	Acrolein[4]	Benzene[4]	E-Benzene[4]	Toluene[4]	Xylene[4]	Total HAP	Units
Emission Factors	0.55	3.11	1.67		0.037	0.43								g/hp-hr
AP-42					0.010		0.00836	0.00514	0.00044	0.0000397	0.000408	0.000184		lb/MMBtu
				0.020										gr/scf
Hourly Totals	1.67	9.46	5.08	0.058	0.11	1.31	0.09	0.058	0.0050	0.00045	0.0046	0.0021	1.47	lb/hr
Annual Totals	7.33	41.44	22.25	0.26	0.50	5.73	0.41	0.26	0.022	0.0020	0.020	0.009	6.45	ton/yr

Controlled Emissions

	NO_x[1]	CO[1]	VOC[1]	SO_2[2]	PM[3]	Formaldehyde[1]	Acetaldehyde[4]	Acrolein[4]	Benzene[4]	E-Benzene[4]	Toluene[4]	Xylene[4]	Total HAP	Units
Emission Factors	0.55	0.62	0.58		0.037	0.086								g/hp-hr
AP-42					0.010		0.00836	0.00514	0.00044	0.0000397	0.000408	0.000184		lb/MMBtu
				0.020										gr/scf
Percent Reduction	0.0%	80.1%	65.3%			80.0%								
Hourly Totals	1.67	1.89	1.76	0.058	0.11	0.26	0.09	0.058	0.0050	0.00045	0.0046	0.0021	0.43	lb/hr
Annual Totals	7.33	8.26	7.73	0.26	0.50	1.15	0.41	0.26	0.022	0.0020	0.020	0.009	1.87	ton/yr

GHG Calculations

CO_2[5]	N_2O[5]	CH_4[5]	CO_2e[5]		
53.06	0.0001	0.001		kg/MMBtu	40 CFR 98 Subpart C Tables C-1 and C-2
1	298	25		GWP	40 CFR 98 Table A-1
5804.93	0.01	0.11	5805.06	tpy	
5804.93	3.26	2.74	5810.93	tpy CO2e	

Stack and Exhast Parameters

Velocity	109.49	ft/s	calculated
Flow Rate	9127	acfm	catalyst spec
Flow rate	152	acfs	calculated
Area	1.39	ft^2	calculated
Stack Diameter	1.33	ft	from previous application
Stack Height	25	ft	client specified
Temperature	993	F	catalyst spec

Notes

Converted EF for AECT

*VOC EFs include Formaldehyde

[1] Emissions factors are referenced from the catalyst spec sheet.

[2] SO_2 is calculated based on the default fuel sulfur content from AECT of 0.002 grains total sulfur per scf.

[3] Assumes PM_{10} = $PM_{2.5}$ (condensable and filterable particulate), referenced from AP-42 Table 3.2-2.

[4] HAPs emissions factors are referenced from AP-42 Table 3.2-2.
HAPs include: Formaldehyde, Acetaldehyde, Acrolein, Benzene, Ethylbenzene, N-Hexane, Toluene, and Xylene
HAP emission factors were adjusted using the heat value of gas from site and standard 1020 Btu/scf

[5] N_2O, CH_4, and CO_2 tpy Emission Rate = EF * Fuel Usage * Fuel Heat Value *2.20462 lb/kg * 1 ton/2000 lb
CO_2e tpy Emission Rate = CO_2 Emission Rate + N_2O Emission Rate * GWP Factor + CH_4 Emission Rate * GWP Factor

Compressor Engines
New Source Review Permit
Horned Frog Compressor Station
Delaware G&P, LLC

Unit:	**E-4**		
Model: 4SLB	Caterpillar G3606 A4		
	1875	hp	Mfg. specs
Fuel Consumption:	6649	Btu/hp-hr	Mfg. specs
Fuel Heating Value:	1111.00	Btu/scf	Facility Specific
Daily Fuel Usage:	269311	scf/day	Calculated
Hourly Fuel Usage:	11221	scf/hr	Calculated
Annual Fuel Usage:	98.30	MMscf/yr	Calculated

Uncontrolled Emissions

	NO_x[1]	CO[1]	VOC[1]	SO_2[2]	PM[3]	Formaldehyde[4]	Acetaldehyde[4]	Acrolein[4]	Benzene[4]	E-Benzene[4]	Toluene[4]	Xylene[4]	Total HAP	Units
Emission Factors	0.50	2.20	0.69		0.030	0.16								g/hp-hr
AP-42					0.010	0.0528	0.00836	0.00514	0.00044	0.0000397	0.000408	0.000184		lb/MMBtu
				0.020										gr/scf
Hourly Totals	2.07	9.09	2.85	0.064	0.12	0.66	0.10	0.064	0.0055	0.00049	0.0051	0.0023	0.84	lb/hr
Annual Totals	9.05	39.83	12.49	0.28	0.55	2.88	0.46	0.28	0.024	0.0022	0.022	0.010	3.68	ton/yr

Controlled Emissions

	NO_x[1]	CO[1]	VOC[1]	SO_2[2]	PM[3]	Formaldehyde[1]	Acetaldehyde[4]	Acrolein[4]	Benzene[4]	E-Benzene[4]	Toluene[4]	Xylene[4]	Total HAP	Units
Emission Factors	0.50	0.50	0.30		0.030	0.020								g/hp-hr
AP-42					0.010		0.00836	0.00514	0.00044	0.0000397	0.000408	0.000184		lb/MMBtu
				0.020										gr/scf
Percent Reduction	0.0%	77.3%	56.5%			87.4%								
Hourly Totals	2.07	2.07	1.24	0.064	0.12	0.08	0.10	0.064	0.0055	0.00049	0.0051	0.0023	0.26	lb/hr
Annual Totals	9.05	9.05	5.43	0.28	0.55	0.36	0.46	0.28	0.024	0.0022	0.022	0.010	1.16	ton/yr

GHG Calculations

	CO_2[5]	N_2O[5]	CH_4[5]	CO_2e[5]		
	53.06	0.0001	0.001		kg/MMBtu	40 CFR 98 Subpart C Tables C-1 and C-2
	1	298	25		GWP	40 CFR 98 Table A-1
	6387.53	0.01	0.12	6387.66	tpy	
	6387.53	3.59	3.01	6394.12	tpy CO2e	

Stack and Exhast Parameters

Velocity	63.70	ft/s	calculated
Flow Rate	12008	acfm	catalyst spec
Flow rate	200	acfs	calculated
Area	3.14	ft^2	calculated
Stack Diameter	2	ft	from previous application
Stack Height	27.25	ft	client specified
Temperature	809	F	catalyst spec

Notes

Converted EF for AECT

*VOC EFs include Formaldehyde

[1] Emissions factors are referenced from the catalyst spec sheet.

[2] SO_2 is calculated based on the default fuel sulfur content from AECT of 0.002 grains total sulfur per scf.

[3] Assumes PM_{10} = $PM_{2.5}$ (condensable and filterable particulate), referenced from AP-42 Table 3.2-2.

[4] HAPs emissions factors are referenced from AP-42 Table 3.2-2.
HAPs include: Formaldehyde, Acetaldehyde, Acrolein, Benzene, Ethylbenzene, N-Hexane, Toluene, and Xylene
HAP emission factors were adjusted using the heat value of gas from site and standard 1020 Btu/scf

[5] N_2O, CH_4, and CO_2 tpy Emission Rate = EF * Fuel Usage * Fuel Heat Value *2.20462 lb/kg * 1 ton/2000 lb
CO_2e tpy Emission Rate = CO_2 Emission Rate + N_2O Emission Rate * GWP Factor + CH_4 Emission Rate * GWP Factor

Compressor Engines
New Source Review Permit
Horned Frog Compressor Station
Delaware G&P, LLC

Unit:	**E-5, E-6, E-7, E-8, E-9b**		
Model: 4SRB	Waukesha P9394GSI S5		
	2500	hp	Mfg. specs
Fuel Consumption:	6974	Btu/hp-hr	Mfg. specs
Fuel Heating Value:	1111.00	Btu/scf	Facility Specific
Daily Fuel Usage:	376634	scf/day	Calculated
Hourly Fuel Usage:	15693	scf/hr	Calculated
Annual Fuel Usage:	137.47	MMscf/yr	Calculated

Uncontrolled Emissions

	NO_x[1]	CO[1]	VOC[1]	SO_2[2]	PM[3]	Formaldehyde[1]	Acetaldehyde[4]	Acrolein[4]	Benzene[4]	E-Benzene[4]	Toluene[4]	Xylene[4]	Total HAP	Units
Emission Factors	11.97	6.06	0.60		0.061	0.05								g/hp-hr
AP-42					0.019		0.00279	0.00263	0.00158	0.0000248	0.000558	0.000195		lb/MMBtu
				0.020										gr/scf
Hourly Totals	65.97	33.40	3.307	0.0897	0.338	0.276	0.0486	0.0459	0.02755	0.000432	0.00973	0.00340	0.411	lb/hr
Annual Totals	288.96	146.29	14.484	0.393	1.482	1.207	0.2131	0.2008	0.1207	0.001894	0.0426	0.01489	1.801	ton/yr

Controlled Emissions

	NO_x	CO	VOC	SO_2[2]	PM[3]	Formaldehyde[1]	Acetaldehyde[4]	Acrolein[4]	Benzene[4]	E-Benzene[4]	Toluene[4]	Xylene[4]	Total HAP	Units
Emission Factors	0.30	0.40	0.25		0.061	0.04								g/hp-hr
AP-42					0.019		0.00279	0.00263	0.00158	0.0000248	0.000558	0.000195		lb/MMBtu
				0.020										gr/scf
Percent Reduction	97.49%	93.40%	58.33%			20.00%								
Hourly Totals	1.653	2.205	1.378	0.0897	0.338	0.220	0.0486	0.0459	0.02755	0.000432	0.00973	0.00340	0.356	lb/hr
Annual Totals	7.24	9.66	6.035	0.393	1.482	0.966	0.2131	0.2008	0.1207	0.001894	0.0426	0.01489	1.560	ton/yr

GHG Calculations

CO_2[5]	N_2O[5]	CH_4[5]	CO_2e[5]		
53.06	0.0001	0.001		kg/MMBtu	40 CFR 98 Subpart C Tables C-1 and C-2
1	298	25		GWP	40 CFR 98 Table A-1
8932.99	0.01684	0.168	8933.18	tpy	
8932.99	5.02	4.21	8942.22	tpy CO2e	

Stack and Exhast Parameters

Velocity	55.30	ft/s	calculated
Flow rate	10423	acfm	catalyst spec sheet
Flow rate	173.72	acfs	calculated
Area	3.142	ft^2	calculated
Stack Diameter	2	ft	client specification
Stack Height	24.5	ft	client specification
Temperature	1066	F	catalyst spec sheet

Notes

Converted EF for AECT *VOC EFs include Formaldehyde

[1] Emissions factors are referenced from the catalyst spec sheet.

[2] SO_2 is calculated based on the default fuel sulfur content from AECT of 0.002 grains total sulfur per scf.

[3] Assumes PM_{10} = $PM_{2.5}$ (condensable and filterable particulate), referenced from AP-42 Table 3.2-2.

[4] HAPs emissions factors are referenced from AP-42 Table 3.2-2.
HAPs include: Formaldehyde, Acetaldehyde, Acrolein, Benzene, Ethylbenzene, N-Hexane, Toluene, and Xylene
HAP emission factors were adjusted using the heat value of gas from site and standard 1020 Btu/scf

[5] N_2O, CH_4, and CO_2 tpy Emission Rate = EF * Fuel Usage * Fuel Heat Value *2.20462 lb/kg * 1 ton/2000 lb
CO_2e tpy Emission Rate = CO_2 Emission Rate + N_2O Emission Rate * GWP Factor + CH_4 Emission Rate * GWP Factor

Compressor Engines
New Source Review Permit
Horned Frog Compressor Station
Delaware G&P, LLC

Unit:	**E-9a**		
Model: 4SLB	Caterpillar G3608 A4		
	2500	hp	Mfg. specs
Fuel Consumption:	7596	Btu/hp-hr	Mfg. specs
Fuel Heating Value:	1111.00	Btu/scf	Facility Specific
Daily Fuel Usage:	410225	scf/day	Calculated
Hourly Fuel Usage:	17093	scf/hr	Calculated
Annual Fuel Usage:	149.73	MMscf/yr	Calculated

Uncontrolled Emissions

	NO_x[1]	CO[1]	VOC[1]	SO_2[2]	PM[3]	Formaldehyde[1]	Acetaldehyde[4]	Acrolein[4]	Benzene[4]	E-Benzene[4]	Toluene[4]	Xylene[4]	Total HAP	Units
Emission Factors	0.30	2.25	0.42		0.034	0.12								g/hp-hr
AP-42					0.010		0.00836	0.00514	0.00044	0.0000397	0.000408	0.000184		lb/MMBtu
				0.020										gr/scf
Hourly Totals	1.65	12.40	2.31	0.098	0.19	0.66	0.16	0.098	0.0084	0.00075	0.0077	0.0035	0.94	lb/hr
Annual Totals	7.24	54.32	10.14	0.43	0.83	2.90	0.70	0.43	0.037	0.0033	0.034	0.015	4.11	ton/yr

Controlled Emissions

	NO_x[1]	CO[1]	VOC[1]	SO_2[2]	PM[3]	Formaldehyde[1]	Acetaldehyde[4]	Acrolein[4]	Benzene[4]	E-Benzene[4]	Toluene[4]	Xylene[4]	Total HAP	Units
Emission Factors	0.30	0.40	0.30		0.034	0.040								g/hp-hr
AP-42					0.010		0.00836	0.00514	0.00044	0.0000397	0.000408	0.000184		lb/MMBtu
				0.020										gr/scf
Percent Reduction	0.0%	82.2%	28.6%			66.7%								
Hourly Totals	1.65	2.20	1.65	0.098	0.19	0.22	0.16	0.098	0.0084	0.00075	0.0077	0.0035	0.50	lb/hr
Annual Totals	7.24	9.66	7.24	0.43	0.83	0.97	0.70	0.43	0.037	0.0033	0.034	0.015	2.18	ton/yr

GHG Calculations

	CO_2[5]	N_2O[5]	CH_4[5]	CO_2e[5]		
	53.06	0.0001	0.001		kg/MMBtu	40 CFR 98 Subpart C Tables C-1 and C-2
	1	298	25		GWP	40 CFR 98 Table A-1
	9729.71	0.02	0.18	9729.92	tpy	
	9729.71	5.46	4.58	9739.76	tpy CO2e	

Stack and Exhast Parameters

Velocity	85.75	ft/s	calculated
Flow Rate	16164	acfm	catalyst spec
Flow rate	269	acfs	calculated
Area	3.14	ft^2	calculated
Stack Diameter	2	ft	client specified
Stack Height	27.25	ft	client specified
Temperature	812	F	catalyst spec

Notes: Converted EF for AECT *VOC EFs include Formaldehyde

[1] Emissions factors are referenced from the catalyst spec sheet.

[2] SO_2 is calculated based on the default fuel sulfur content from AECT of 0.002 grains total sulfur per scf.

[3] Assumes $PM_{10} = PM_{2.5}$ (condensable and filterable particulate), referenced from AP-42 Table 3.2-2.

[4] HAPs emissions factors are referenced from AP-42 Table 3.2-2.
HAPs include: Formaldehyde, Acetaldehyde, Acrolein, Benzene, Ethylbenzene, N-Hexane, Toluene, and Xylene
HAP emission factors were adjusted using the heat value of gas from site and standard 1020 Btu/scf

[5] N_2O, CH_4, and CO_2 tpy Emission Rate = EF * Fuel Usage * Fuel Heat Value *2.20462 lb/kg * 1 ton/2000 lb
CO_2e tpy Emission Rate = CO_2 Emission Rate + N_2O Emission Rate * GWP Factor + CH_4 Emission Rate * GWP Factor

Compressor Engines
New Source Review Permit
Horned Frog Compressor Station
Delaware G&P, LLC

Unit:	**E-10a**		
Model: 4SLB	Caterpillar G3612 A4		
	3750	hp	Mfg. specs
Fuel Consumption:	7543	Btu/hp-hr	Mfg. specs
Fuel Heating Value:	1111.00	Btu/scf	Facility Specific
Daily Fuel Usage:	611044	scf/day	Calculated
Hourly Fuel Usage:	25460	scf/hr	Calculated
Annual Fuel Usage:	223.03	MMscf/yr	Calculated

Uncontrolled Emissions

	NO_x[1]	CO[1]	VOC[1]	SO_2[2]	PM[3]	Formaldehyde[1]	Acetaldehyde[4]	Acrolein[4]	Benzene[4]	E-Benzene[4]	Toluene[4]	Xylene[4]	Total HAP	Units
Emission Factors	0.30	2.95	0.73		0.034	0.19								g/hp-hr
AP-42					0.010		0.00836	0.00514	0.00044	0.0000397	0.000408	0.000184		lb/MMBtu
				0.020										gr/scf
Hourly Totals	2.48	24.39	6.04	0.145	0.28	1.57	0.24	0.145	0.0124	0.00112	0.0115	0.0052	1.98	lb/hr
Annual Totals	10.86	106.82	26.43	0.64	1.24	6.88	1.04	0.64	0.055	0.0049	0.051	0.023	8.69	ton/yr

Controlled Emissions

	NO_x[1]	CO[1]	VOC[1]	SO_2[2]	PM[3]	Formaldehyde[1]	Acetaldehyde[4]	Acrolein[4]	Benzene[4]	E-Benzene[4]	Toluene[4]	Xylene[4]	Total HAP	Units
Emission Factors	0.30	0.30	0.25		0.034	0.030								g/hp-hr
AP-42					0.010		0.00836	0.00514	0.00044	0.0000397	0.000408	0.000184		lb/MMBtu
				0.020										gr/scf
Percent Reduction	0.0%	89.8%	65.8%			84.2%								
Hourly Totals	2.48	2.48	2.07	0.145	0.28	0.25	0.24	0.145	0.0124	0.00112	0.0115	0.0052	0.66	lb/hr
Annual Totals	10.86	10.86	9.05	0.64	1.24	1.09	1.04	0.64	0.055	0.0049	0.051	0.023	2.89	ton/yr

GHG Calculations

	CO_2[5]	N_2O[5]	CH_4[5]	CO_2e[5]		
	53.06	0.0001	0.001		kg/MMBtu	40 CFR 98 Subpart C Tables C-1 and C-2
	1	298	25		GWP	40 CFR 98 Table A-1
	14492.74	0.03	0.27	14493.04	tpy	
	14492.74	8.14	6.83	14507.71	tpy CO2e	

Stack and Exhast Parameters

Velocity	126.98	ft/s	calculated
Flow Rate	23936	acfm	mfg.data
Flow rate	399	acfs	
Area	3.14	ft^2	calculated
Stack Diameter	2	ft	client specified
Stack Height	28.58	ft	client specified
Temperature	840	F	client specified

Notes: Converted EF for AECT *VOC EFs include Formaldehyde

[1] Emissions factors are referenced from the catalyst spec sheet.

[2] SO_2 is calculated based on the default fuel sulfur content from AECT of 0.002 grains total sulfur per scf.

[3] Assumes $PM_{10} = PM_{2.5}$ (condensable and filterable particulate), referenced from AP-42 Table 3.2-2.

[4] HAPs emissions factors are referenced from AP-42 Table 3.2-2.
HAPs include: Formaldehyde, Acetaldehyde, Acrolein, Benzene, Ethylbenzene, N-Hexane, Toluene, and Xylene
HAP emission factors were adjusted using the heat value of gas from site and standard 1020 Btu/scf

[5] N_2O, CH_4, and CO_2 tpy Emission Rate = EF * Fuel Usage * Fuel Heat Value *2.20462 lb/kg * 1 ton/2000 lb
CO_2e tpy Emission Rate = CO_2 Emission Rate + N_2O Emission Rate * GWP Factor + CH_4 Emission Rate * GWP Factor

Compressor Engines
New Source Review Permit
Horned Frog Compressor Station
Delaware G&P, LLC

Unit:	**E-10b**		
Model: 4SLB	Waukesha 12V275GL		
	3750	hp	Mfg. specs
Fuel Consumption:	6805	Btu/hp-hr	Mfg. specs
Fuel Heating Value:	1111.00	Btu/scf	Facility Specific
Daily Fuel Usage:	551260	scf/day	Calculated
Hourly Fuel Usage:	22969	scf/hr	Calculated
Annual Fuel Usage:	201.21	MMscf/yr	Calculated

Uncontrolled Emissions

	NO_x[1]	CO[1]	VOC[1]	SO_2[2]	PM[3]	Formaldehyde[1]	Acetaldehyde[4]	Acrolein[4]	Benzene[4]	E-Benzene[4]	Toluene[4]	Xylene[4]	Total HAP	Units
Emission Factors	0.30	2.40	0.50		0.031	0.05								g/hp-hr
AP-42					0.010		0.00836	0.00514	0.00044	0.0000397	0.000408	0.000184		lb/MMBtu
				0.020										gr/scf
Hourly Totals	2.48	19.84	4.17	0.131	0.25	0.41	0.21	0.131	0.0112	0.00101	0.0104	0.0047	0.79	lb/hr
Annual Totals	10.86	86.91	18.25	0.57	1.12	1.81	0.93	0.57	0.049	0.0044	0.046	0.021	3.44	ton/yr

Controlled Emissions

	NO_x[1]	CO[1]	VOC[1]	SO_2[2]	PM[3]	Formaldehyde[1]	Acetaldehyde[4]	Acrolein[4]	Benzene[4]	E-Benzene[4]	Toluene[4]	Xylene[4]	Total HAP	Units
Emission Factors	0.30	0.17	0.25		0.031	0.010								g/hp-hr
AP-42					0.010		0.00836	0.00514	0.00044	0.0000397	0.000408	0.000184		lb/MMBtu
				0.020										gr/scf
Percent Reduction	0.0%	93.0%	50.0%			80.0%								
Hourly Totals	2.48	1.39	2.08	0.131	0.25	0.08	0.21	0.131	0.0112	0.00101	0.0104	0.0047	0.45	lb/hr
Annual Totals	10.86	6.08	9.13	0.57	1.12	0.36	0.93	0.57	0.049	0.0044	0.046	0.021	1.99	ton/yr

GHG Calculations

	CO_2[5]	N_2O[5]	CH_4[5]	CO_2e[5]		
	53.06	0.0001	0.001		kg/MMBtu	40 CFR 98 Subpart C Tables C-1 and C-2
	1	298	25		GWP	40 CFR 98 Table A-1
	13074.78	0.02	0.25	13075.05	tpy	
	13074.78	7.34	6.16	13088.29	tpy CO2e	

Stack and Exhast Parameters

Velocity	88.02	ft/s	calculated
Flow Rate	25925	acfm	catalyst spec
Flow rate	432	acfs	
Area	4.91	ft^2	calculated
Stack Diameter	2.5	ft	client specified
Stack Height	34.92	ft	client specified
Temperature	836	F	catalyst spec

Notes: Converted EF for AECT *VOC EFs include Formaldehyde

[1] Emissions factors are referenced from the catalyst spec sheet.

[2] SO_2 is calculated based on the default fuel sulfur content from AECT of 0.002 grains total sulfur per scf.

[3] Assumes $PM_{10} = PM_{2.5}$ (condensable and filterable particulate), referenced from AP-42 Table 3.2-2.

[4] HAPs emissions factors are referenced from AP-42 Table 3.2-2.
HAPs include: Formaldehyde, Acetaldehyde, Acrolein, Benzene, Ethylbenzene, N-Hexane, Toluene, and Xylene
HAP emission factors were adjusted using the heat value of gas from site and standard 1020 Btu/scf

[5] N_2O, CH_4, and CO_2 tpy Emission Rate = EF * Fuel Usage * Fuel Heat Value *2.20462 lb/kg * 1 ton/2000 lb
CO_2e tpy Emission Rate = CO_2 Emission Rate + N_2O Emission Rate * GWP Factor + CH_4 Emission Rate * GWP Factor

Generator Engines
New Source Review Permit
Horned Frog Compressor Station
Delaware G&P, LLC

Unit:	**GEN-4 & GEN-5**		
Model: 4SRB	Aggreko GG0400GASCON		
	536	hp	Mfg. specs
Fuel Consumption:	8000	Btu/hp-hr	assumed, same as previous application
Fuel Heating Value:	1111.00	Btu/scf	Facility Specific
Daily Fuel Usage:	92630	scf/day	Calculated
Hourly Fuel Usage:	3860	scf/hr	Calculated
Annual Fuel Usage:	33.81	MMscf/yr	Calculated

Uncontrolled Emissions

	NO_x[1]	CO[1]	VOC[1]	SO_2[2]	PM[3]	Formaldehyde[4]	Acetaldehyde[4]	Acrolein[4]	Benzene[4]	E-Benzene[4]	Toluene[4]	Xylene[4]	Total HAP	Units
Emission Factors	1.00	2.000	0.700		0.070	0.074								g/hp-hr
AP-42					0.019	0.0205	0.00279	0.00263	0.00158	0.0000248	0.000558	0.000195		lb/MMBtu
				0.020										gr/scf
Hourly Totals	1.18	2.36	0.827	0.0221	0.083	0.088	0.0120	0.0113	0.00678	0.000106	0.00239	0.00084	0.121	lb/hr
Annual Totals	5.18	10.35	3.623	0.097	0.365	0.385	0.0524	0.0494	0.0297	0.000466	0.0105	0.00366	0.531	ton/yr

Controlled Emissions

	NO_x	CO	VOC	SO_2[2]	PM[3]	Formaldehyde[4]	Acetaldehyde[4]	Acrolein[4]	Benzene[4]	E-Benzene[4]	Toluene[4]	Xylene[4]	Total HAP	Units
Emission Factors	1.00	2.000	0.774		0.070	0.074								g/hp-hr
AP-42					0.019	0.0205	0.00279	0.00263	0.00158	0.0000248	0.000558	0.000195		lb/MMBtu
				0.020										gr/scf
Percent Reduction	0.00%	0.00%												
Hourly Totals	1.182	2.363	0.915	0.0221	0.083	0.088	0.0120	0.0113	0.00678	0.000106	0.00239	0.00084	0.121	lb/hr
Annual Totals	5.18	10.35	4.006	0.097	0.365	0.385	0.0524	0.0494	0.0297	0.000466	0.0105	0.00366	0.531	ton/yr

GHG Calculations

	CO_2[5]	N_2O[5]	CH_4[5]	CO_2e[5]		
	53.06	0.0001	0.001		kg/MMBtu	40 CFR 98 Subpart Tables
	1	298	25		GWP	40 CFR 98 Table A-1
	2197.00	0.00414	0.041	2197.04	tpy	
	2197.00	1.23	1.04	2199.27	tpy CO2e	

Stack and Exhast Parameters

Velocity	205.84	ft/s	calculated
Flow rate	2425	acfm	client specification
Flow rate	40.42	acfs	
Area	0.196	ft^2	calculated
Stack Diameter	0.5	ft	client specification
Stack Height	15	ft	based on stack calculator
Temperature	1000	F	from previous permit

Notes: Converted EF for AECT *VOC EFs include Formaldehyde

[1] Emissions factors are referenced from the catalyst spec sheet.

[2] SO_2 is calculated based on the default fuel sulfur content from AECT of 0.002 grains total sulfur per scf.

[3] Assumes $PM_{10} = PM_{2.5}$ (condensable and filterable particulate), referenced from AP-42 Table 3.2-2.

[4] HAPs emissions factors are referenced from AP-42 Table 3.2-2.
HAPs include: Formaldehyde, Acetaldehyde, Acrolein, Benzene, Ethylbenzene, N-Hexane, Toluene, and Xylene
HAP emission factors were adjusted using the heat value of gas from site and standard 1020 Btu/scf

[5] N_2O, CH_4, and CO_2 tpy Emission Rate = EF * Fuel Usage * Fuel Heat Value *2.20462 lb/kg * 1 ton/2000 lb
CO_2e tpy Emission Rate = CO_2 Emission Rate + N_2O Emission Rate * GWP Factor + CH_4 Emission Rate * GWP Factor

Heater/Reboiler Calcs
New Source Review Permit
Horned Frog Compressor Station
Delaware G&P, LLC

EPN	FIN	Description	Rated Duty (MMBtu/hr)	Fuel Lower Heating Value (Btu/scf)	Annual Operating Hours (hr/yr)	Correction Factor	Pollutant		Emission Factor [a]	Unit	Potential to Emit (PTE) Hourly [b] (lb/hr)	Potential to Emit (PTE) Annual [c] (T/yr)
HT-1	HT-1	DEHY1 Glycol Reboiler	0.50	1,111	8,760	1.00	NO_X		100	lb/MMscf	0.05	0.20
							CO		84	lb/MMscf	0.04	0.17
							PM	[d]	7.6	lb/MMscf	0.00	0.01
							SO_2	[e]	0.00286	lb S/Mscf	0.0026	0.011
							VOC		5.5	lb/MMscf	0.002	0.011
							CH_2O		0.075	lb/MMscf	0.00003	0.0001
						GWP					**Mass tpy**	**tpy CO_2e**
						1	CO_2 [5]		53.0600	kg/MMBtu	256.18	256.18
						298	N_2O [5]		0.0001	kg/MMBtu	0.00048	0.1439
						25	CH_4 [5]		0.0010	kg/MMBtu	0.00483	0.1207
							CO_2e [5]				256.19	256.44
HT-2	HT-2	DEHY2 Glycol Reboiler	1.00	1,111	8,760	1.00	NO_X		100	lb/MMscf	0.09	0.39
							CO		84	lb/MMscf	0.08	0.33
							PM	[d]	7.6	lb/MMscf	0.007	0.03
							SO_2	[e]	0.00286	lb S/Mscf	0.0051	0.023
							VOC		5.5	lb/MMscf	0.005	0.02
							CH_2O		0.075	lb/MMscf	0.00007	0.0003
						GWP					**Mass tpy**	**tpy CO_2e**
						1	CO_2 [5]		53.0600	kg/MMBtu	512.36	512.36
						298	N_2O [5]		0.0001	kg/MMBtu	0.00097	0.2878
						25	CH_4 [5]		0.0010	kg/MMBtu	0.00966	0.2414
							CO_2e [5]				512.37	512.89

[a] Unless otherwise noted, emission factors are from AP-42 Tables 1.4-1, 1.4-2, and 1.4-3 (dated 7/98). GHG emission factors are from 40 cfr 98

[b] Example calculations for hourly PTE CO and SO_2 for EPN H-1 follow:

CO (lb/hr) = (Rated Duty, MMBtu/hr)*(Correction Factor)/(Fuel Heating Value, Btu/scf)*(Emission Factor, lb/MMscf)

CO (lb/hr) = (0.50 MMBtu/hr)*(1.00)/(1,111 Btu/scf)*(84 lb/MMscf)

= 0.04 lb/hr CO

Sulfur content of 2 gr S/100 scf or 0.00286 lb S/Mscf is conservatively assumed for variance in field gas quality.

SO_2 (lb/hr) = (Rated Duty, MMBtu/hr)/(Fuel Heating Value, Btu/scf)*(1000scf/Mscf)*(Sulfur Content, lb S/Mscf gas)*(64.06 lb SO_2/32.06 lb S)

SO_2 (lb/hr) = (0.50 MMBtu/hr)/(1,111 Btu/scf)*(1000scf/Mscf)*(0.00286 lb S/Mscf gas)*(64.06 lb SO2/32.06 lb S)

= 0.0026 lb/hr SO_2

[c] An example calculation for annual PTE CO for EPN H-1 follows:

CO (T/yr) = (Hourly PTE, lb/hr)*(Annual Operating Hours, hr/yr)/(2,000 lb/T)

CO (T/yr) = (0.04 lb/hr)*(8,760 hr/yr)/(2,000 lb/T)

= 0.17 T/yr CO

[d] All PM is assumed to be less than 2.5 microns in diameter per footnote "c" of AP-42 Table 1.4-2.

[e] A material balance approach was used to estimate the SO_2 emission rates using the maximum sulfur concentration in the natural gas.

Dehydrator Calcs
New Source Review Permit
Horned Frog Compressor Station
Delaware G&P, LLC

	DEHY1 25 MMSCFD						DEHY2 100 MMSCFD					
DEHY1	**Regenerator Still Vent**		**Regenerator**		**Flash Tank**		**Regenerator Still Vent**		**Regenerator**		**Flash Tank**	
25 MMSCFD	**Uncontrolled**		**Controlled**		**Uncontrolled**		**Uncontrolled**		**Controlled**		**Uncontrolled**	
Component	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
Carbon Dioxide	0.979	4.286	62.335	273.026	3.376	14.785	1.134	4.968	60.164	263.520	3.744	16.399
Hydrogen Sulfide	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Nitrogen	0.002	0.009	622.499	2726.544	0.212	0.927	0.002	0.011	597.882	2618.722	0.236	1.033
Methane	0.493	2.161	0.010	0.043	14.032	61.461	0.559	2.448	0.011	0.049	15.412	67.504
Ethane	1.280	5.606	0.025	0.112	10.999	48.177	1.340	5.871	0.027	0.117	11.661	51.073
Propane	2.660	11.653	0.053	0.231	12.168	53.297	2.622	11.484	0.052	0.227	12.518	54.829
i-Butane	0.636	2.785	0.012	0.054	2.152	9.427	0.598	2.619	0.012	0.051	2.177	9.536
n-Butane	3.072	13.457	0.059	0.260	7.180	31.448	2.933	12.846	0.057	0.250	7.277	31.874
i-Pentane	1.275	5.585	0.023	0.103	1.907	8.354	1.162	5.091	0.022	0.095	1.909	8.360
n-Pentane	2.017	8.835	0.036	0.159	2.539	11.120	1.752	7.672	0.032	0.140	2.475	10.841
Cyclopentane	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
n-Hexane	4.104	17.977	0.062	0.273	2.516	11.020	3.444	15.086	0.054	0.239	2.467	10.807
Cyclohexane	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
n-Heptane	2.254	9.871	0.024	0.103	0.858	3.759	1.841	8.064	0.021	0.091	0.841	3.685
Methylcyclohexane	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2,2,4-Trimethylpentane	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Benzene	4.830	21.155	0.063	0.277	0.252	1.102	4.803	21.036	0.064	0.280	0.265	1.162
Toluene	3.831	16.780	0.030	0.132	0.112	0.489	3.757	16.457	0.031	0.138	0.117	0.512
Ethylbenzene	0.136	0.596	0.000	0.002	0.002	0.011	0.135	0.591	0.001	0.002	0.003	0.011
o-Xylene	0.259	1.135	0.001	0.004	0.004	0.016	0.270	1.182	0.001	0.005	0.004	0.017
m-Xylene	0.821	3.597	0.003	0.013	0.015	0.064	0.805	3.526	0.003	0.014	0.015	0.067
p-Xylene	0.065	0.285	0.000	0.001	0.001	0.005	0.064	0.280	0.000	0.001	0.001	0.006
Triethylene Glycol	0.016	0.072	0.000	0.000	0.003	0.015	0.038	0.168	0.000	0.000	0.003	0.012
Ethylene Glycol	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Water	67.931	297.539	27.910	122.244	0.364	1.593	266.593	1167.675	26.745	117.142	0.950	4.160
Methanol	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
O2	0.000	0.000	120.410	527.395	0.000	0.000	0.000	0.000	115.648	506.538	0.000	0.000
SO2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total VOC	25.96	113.71	**0.37**	**1.61**	29.71	130.11	24.19	105.93	**0.35**	**1.53**	30.07	131.71
Total HAPs	14.05	61.52	**0.16**	**0.70**	2.90	12.71	13.28	58.16	**0.15**	**0.68**	2.87	12.58
Total GHG	1.47	6.45	**62.34**	**273.07**	17.41	76.25	1.69	7.42	**60.18**	**263.57**	19.16	83.90

VRU Capture	**98%**		
VRU Downtime	**5%**	**438**	**hrs/yr**
VRU Uptime	**95%**		
ECD DRE	**98%**		

Flash Tank Off Gas is routed to the VRU with 98% capture, with 5% downtime routed to th ECD for 98% DRE.
Regenerator still vent is routed to a BTEX condenser and remaining gas is controlled by the reboiler glow plug for a total control efficiency of 98%

Dehydrator Calcs
New Source Review Permit
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Delaware G&P, LLC

	DEHY1 25 MMSCFD									
Dehydrator Emissions	Flash Tank Uncontrolled		2% Uncaptured by VRU		5% VRU Downtime routed to ECD		Controlled Flash Tank Emissions		**Total Regen and Flash Tank Emissions**	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	**lb/hr**	**tpy**
Std Vapor Flow MSCFH	0.7155		0.0143		0.7012	0.3071				
VOCs	29.7061	130.1128	0.5941	2.6023	29.1120	6.3755	0.5822	0.1275	**1.54**	**4.34**
Benzene	0.2516	1.1022	0.0050	0.0220	0.2466	0.0540	0.0049	0.0011	**0.07**	**0.30**
HAPs	2.9013	12.7077	0.0580	0.2542	2.8433	0.6227	0.0569	0.0125	**0.28**	**0.97**
Methane	-	61.4614	-	1.2292	-	3.0116	-	0.0602	**-**	**1.33**
Carbon Dioxide	-	14.7848	-	0.2957	-	0.7245	-	0.0145	**-**	**273.34**

	DEHY2 100 MMSCFD									
Dehydrator Emissions	Flash Tank Uncontrolled		2% Uncaptured by VRU		5% VRU Downtime routed to ECD		Controlled Flash Tank Emissions		**Total Regen and Flash Tank Emissions**	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	**lb/hr**	**tpy**
Std Vapor Flow MSCFH	0.7756		0.0155		0.7601	0.3329				
VOCs	30.0702	131.7073	0.6014	2.6341	29.4688	6.4537	0.5894	0.1291	**1.54**	**4.30**
Benzene	0.2654	1.1624	0.0053	0.0232	0.2601	0.0570	0.0052	0.0011	**0.07**	**0.30**
HAPs	2.8726	12.5819	0.0575	0.2516	2.8151	0.6165	0.0563	0.0123	**0.27**	**0.94**
Methane	-	67.5044	-	1.3501	-	3.3077	-	0.0662	**-**	**1.47**
Carbon Dioxide	-	16.3991	-	0.3280	-	0.8036	-	0.0161	**-**	**263.86**

Tank and Loading Losses
New Source Review Permit
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Uncontrolled Emissions

	Condensate Tanks Flashing		Gunbarrel Flashing		PW Tanks Flashing		Condensate Tanks Working/Breathing		Gunbarrel Working/Breathing		PW Tanks Working/Breathing		Condensate Loading		Produced Water Loading	
Component	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Nitrogen	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Methane	0.62737	2.74789	0.68748	3.01116	0.00552	0.02417	0.03357	0.14702	0.00402	0.01761	0.00094	0.00412	0.00808	0.03537	0.00029	0.00125
CO2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Ethane	1.80307	7.89745	2.20940	9.67717	0.00465	0.02038	0.42602	1.86597	0.05534	0.24239	0.00082	0.00360	0.10250	0.44894	0.00025	0.00109
Propane	8.37378	36.67715	11.59661	50.79317	0.01209	0.05296	1.49826	6.56239	0.21831	0.95620	0.00036	0.00156	0.36047	1.57885	0.00011	0.00047
i-Butane	4.43787	19.43786	6.58805	28.85565	0.00530	0.02322	0.66948	2.93232	0.10444	0.45743	0.00003	0.00015	0.16107	0.70549	0.00001	0.00004
n-Butane	16.90532	74.04531	25.61113	112.17677	0.01736	0.07605	2.51842	11.03067	0.40086	1.75578	0.00011	0.00049	0.60591	2.65389	0.00003	0.00015
i-Pentane	9.00155	39.42678	14.02112	61.41250	0.00829	0.03630	1.16203	5.08969	0.19015	0.83285	0.00001	0.00006	0.27957	1.22454	0.00000	0.00002
n-Pentane	11.69077	51.20555	18.30680	80.18378	0.00628	0.02750	1.46127	6.40038	0.24042	1.05303	0.00000	0.00002	0.35157	1.53988	0.00000	0.00000
i-Hexane	4.14217	18.14272	6.55181	28.69691	0.00254	0.01112	0.49384	2.16300	0.08210	0.35961	0.00000	0.00000	0.11881	0.52040	0.00000	0.00000
Hexane	6.92459	30.32972	10.97752	48.08153	0.00281	0.01229	0.79677	3.48985	0.13275	0.58143	0.00000	0.00000	0.19170	0.83963	0.00000	0.00000
2,2,4-Trimethylpentane	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benzene	0.36877	1.61520	0.58320	2.55443	0.00047	0.00204	0.02552	0.11179	0.00428	0.01874	0.00002	0.00007	0.00614	0.02690	0.00001	0.00002
Heptane	2.89080	12.66173	4.59742	20.13672	0.00093	0.00408	0.29244	1.28087	0.04891	0.21423	0.00000	0.00000	0.07036	0.30817	0.00000	0.00000
Toluene	0.26222	1.14854	0.41631	1.82344	0.00029	0.00127	0.01746	0.07650	0.00293	0.01281	0.00000	0.00001	0.00420	0.01840	0.00000	0.00000
Octane	0.53189	2.32968	0.84673	3.70867	0.00008	0.00035	0.04405	0.19293	0.00738	0.03231	0.00000	0.00000	0.01060	0.04642	0.00000	0.00000
Ethylbenzene	0.00859	0.03760	0.01365	0.05977	0.00001	0.00004	0.00055	0.00239	0.00009	0.00040	0.00000	0.00000	0.00013	0.00058	0.00000	0.00000
m-Xylene	0.04419	0.19356	0.07026	0.30772	0.00004	0.00019	0.00273	0.01194	0.00046	0.00200	0.00000	0.00000	0.00066	0.00287	0.00000	0.00000
o-Xylene	0.00386	0.01691	0.00613	0.02687	0.00000	0.00002	0.00021	0.00092	0.00004	0.00015	0.00000	0.00000	0.00005	0.00022	0.00000	0.00000
p-Xylene	0.01155	0.05059	0.01837	0.08044	0.00001	0.00005	0.00074	0.00324	0.00012	0.00054	0.00000	0.00000	0.00018	0.00078	0.00000	0.00000
Nonane	0.06981	0.30579	0.11126	0.48733	0.00001	0.00005	0.00452	0.01980	0.00076	0.00332	0.00000	0.00000	0.00109	0.00476	0.00000	0.00000
Decane	0.03429	0.15019	0.05460	0.23915	0.00000	0.00001	0.00177	0.00774	0.00030	0.00130	0.00000	0.00000	0.00043	0.00186	0.00000	0.00000
Water	0.21565	0.94453	2.18943	9.58971	0.00193	0.00845	0.00002	0.00007	0.19622	0.85946	0.12526	0.54864	0.00000	0.00002	0.03800	0.16642
Undecane	0.00032	0.00141	0.00051	52.93421	0.00000	0.01590	0.00002	3.69663	0.00000	0.61607	0.00000	0.00008	0.00000	0.88938	0.00000	0.00003
Total VOC	**65.70**	**287.78**	**100.37**	**439.62**	**0.06**	**0.25**	**8.99**	**39.38**	**1.43**	**6.28**	**0.0005**	**0.0024**	**2.16**	**9.47**	**0.000163**	**0.000715**
Total HAP	**4.84**	**21.21**	**7.66**	**33.55**	**0.0034**	**0.015**	**0.54**	**2.37**	**0.09**	**0.39**	**0.00002**	**0.00009**	**0.13**	**0.57**	**0.000006**	**0.000026**

VRU Capture	**98%**	
VRU Downtime	**5%**	**438 hrs/yr**
VRU Uptime	**95%**	
ECD DRE	**98%**	

Number of Condensate Tanks	**6**	**Condensate Tanks - Vapors routed to VRU at 98% capture and 5% downtime. Vapors routed to ECD during VRU downtime. Uncaptured emissions vented at the tanks.**
Number of Water Tanks	**2**	**PW Tanks - Vapors routed to VRU at 98% capture and 5% downtime. Vapors routed to ECD during VRU downtime. Uncaptured emissions vented at the tanks.**
Number of Gunbarrels	**1**	**Gunbarrel - Vapors routed to VRU at 98% capture and 5% downtime. Vapors routed to ECD during VRU downtime. Uncaptured emissions vented at the tanks.**

VOC Emissions

Storage Tanks	Flashing Emissions		W/B Emissions		Total Uncontrolled Emissions		**2% Uncaptured by VRU**		5% VRU Downtime routed to ECD		**Controlled VRU Downtime Emissions**		**Total Emissions**	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	**lb/hr**	**tpy**
Std Vapor MSCFH					0.503		0.010		0.4927	0.2158				
TK-1: Condensate Tank 1	10.95	47.96	1.50	6.56	12.45	54.53	0.25	1.09	12.20	2.67	0.24	0.05	**0.49**	**1.14**
TK-2: Condensate Tank 2	10.95	47.96	1.50	6.56	12.45	54.53	0.25	1.09	12.20	2.67	0.24	0.05	**0.49**	**1.14**
TK-3: Condensate Tank 3	10.95	47.96	1.50	6.56	12.45	54.53	0.25	1.09	12.20	2.67	0.24	0.05	**0.49**	**1.14**
TK-5: Condensate Tank 5	10.95	47.96	1.50	6.56	12.45	54.53	0.25	1.09	12.20	2.67	0.24	0.05	**0.49**	**1.14**
TK-6: Condensate Tank 6	10.95	47.96	1.50	6.56	12.45	54.53	0.25	1.09	12.20	2.67	0.24	0.05	**0.49**	**1.14**
TK-7: Condensate Tank 7	10.95	47.96	1.50	6.56	12.45	54.53	0.25	1.09	12.20	2.67	0.24	0.05	**0.49**	**1.14**
CONDLOAD					2.16	9.47	0.04	0.19	2.12	0.46	0.04	0.01	**0.09**	**0.20**
Std Vapor MSCFH					0.6867		0.014		0.6730	0.2948				
GB-1: Gunbarrel Tank	100.37	439.62	1.43	6.28	101.81	445.91	2.04	8.92	99.77	21.85	2.00	0.44	**4.03**	**9.36**
Std Vapor MSCFH					0.0041		0.000		0.0040	0.0017				
TK-4: Produced Water Tank 4	0.028	0.124	0.000	0.001	0.029	0.125	0.001	0.002	0.028	0.006	0.00	0.00	**0.00**	**0.00**
TK-8: Produced Water Tank 8	0.028	0.124	0.000	0.001	0.029	0.125	0.001	0.002	0.028	0.006	0.00	0.00	**0.00**	**0.00**
PWLOAD					0.000	0.001	0.000	0.000	0.000	0.000	0.00	0.00	**0.00**	**0.00**

Tank and Loading Losses
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Total HAP Emissions

Storage Tanks	Flashing Emissions		W/B Emissions		Total Uncontrolled Emissions		**2% Uncaptured at Tanks**		5% VRU Downtime routed to ECD		**Controlled VRU Downtime Emissions**		**Total Emissions**	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	**lb/hr**	**tpy**
TK-1: Condensate Tank 1	0.81	3.53	0.09	0.39	0.90	3.93	0.02	0.08	0.88	0.19	0.02	0.00	**0.04**	**0.08**
TK-2: Condensate Tank 2	0.81	3.53	0.09	0.39	0.90	3.93	0.02	0.08	0.88	0.19	0.02	0.00	**0.04**	**0.08**
TK-3: Condensate Tank 3	0.81	3.53	0.09	0.39	0.90	3.93	0.02	0.08	0.88	0.19	0.02	0.00	**0.04**	**0.08**
TK-5: Condensate Tank 5	0.81	3.53	0.09	0.39	0.90	3.93	0.02	0.08	0.88	0.19	0.02	0.00	**0.04**	**0.08**
TK-6: Condensate Tank 6	0.81	3.53	0.09	0.39	0.90	3.93	0.02	0.08	0.88	0.19	0.02	0.00	**0.04**	**0.08**
TK-7: Condensate Tank 7	0.81	3.53	0.09	0.39	0.90	3.93	0.02	0.08	0.88	0.19	0.02	0.00	**0.04**	**0.08**
CONDLOAD					0.13	0.57	0.00	0.01	0.13	0.03	0.00	0.00	**0.01**	**0.01**
GB-1: Gunbarrel Tank	7.66	33.55	0.09	0.39	7.75	33.94	0.15	0.68	7.59	1.66	0.15	0.03	**0.31**	**0.71**
TK-4: Produced Water Tank 4	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**
TK-8: Produced Water Tank 8	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**
PWLOAD					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**

n-Hexane Emissions

Storage Tanks	Flashing Emissions		W/B Emissions		Total Uncontrolled Emissions		**2% Uncaptured at Tanks**		5% VRU Downtime routed to ECD		**Controlled VRU Downtime Emissions**		**Total Emissions**	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	**lb/hr**	**tpy**
TK-1: Condensate Tank 1	0.69	3.02	0.08	0.36	0.77	3.38	0.02	0.07	0.76	0.17	0.02	0.00	**0.031**	**0.071**
TK-2: Condensate Tank 2	0.69	3.02	0.08	0.36	0.77	3.38	0.02	0.07	0.76	0.17	0.02	0.00	**0.031**	**0.071**
TK-3: Condensate Tank 3	0.69	3.02	0.08	0.36	0.77	3.38	0.02	0.07	0.76	0.17	0.02	0.00	**0.031**	**0.071**
TK-5: Condensate Tank 5	0.69	3.02	0.08	0.36	0.77	3.38	0.02	0.07	0.76	0.17	0.02	0.00	**0.031**	**0.071**
TK-6: Condensate Tank 6	0.69	3.02	0.08	0.36	0.77	3.38	0.02	0.07	0.76	0.17	0.02	0.00	**0.031**	**0.071**
TK-7: Condensate Tank 7	0.69	3.02	0.08	0.36	0.77	3.38	0.02	0.07	0.76	0.17	0.02	0.00	**0.031**	**0.071**
CONDLOAD					0.12	0.52	0.00	0.01	0.12	0.03	0.00	0.00	**0.005**	**0.011**
GB-1: Gunbarrel Tank	6.55	2.55	0.08	0.36	6.63	2.91	0.13	0.06	6.50	0.14	0.13	0.00	**0.263**	**0.061**
TK-4: Produced Water Tank 4	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	**0.000**	**0.000**
TK-8: Produced Water Tank 8	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	**0.000**	**0.000**
PWLOAD					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.000**	**0.000**

Benzene Emissions

Storage Tanks	Flashing Emissions		W/B Emissions		Total Uncontrolled Emissions		**2% Uncaptured at Tanks**		5% VRU Downtime routed to ECD		**Controlled VRU Downtime Emissions**		**Total Emissions**	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	**lb/hr**	**tpy**
TK-1: Condensate Tank 1	0.06	0.27	0.00	0.02	0.07	0.29	0.00	0.01	0.06	0.01	0.00	0.00	**0.003**	**0.006**
TK-2: Condensate Tank 2	0.06	0.27	0.00	0.02	0.07	0.29	0.00	0.01	0.06	0.01	0.00	0.00	**0.003**	**0.006**
TK-3: Condensate Tank 3	0.06	0.27	0.00	0.02	0.07	0.29	0.00	0.01	0.06	0.01	0.00	0.00	**0.003**	**0.006**
TK-5: Condensate Tank 5	0.06	0.27	0.00	0.02	0.07	0.29	0.00	0.01	0.06	0.01	0.00	0.00	**0.003**	**0.006**
TK-6: Condensate Tank 6	0.06	0.27	0.00	0.02	0.07	0.29	0.00	0.01	0.06	0.01	0.00	0.00	**0.003**	**0.006**
TK-7: Condensate Tank 7	0.06	0.27	0.00	0.02	0.07	0.29	0.00	0.01	0.06	0.01	0.00	0.00	**0.003**	**0.006**
CONDLOAD					0.01	0.03	0.00	0.00	0.01	0.00	0.00	0.00	**0.000**	**0.001**
GB-1: Gunbarrel Tank	0.58	2.55	0.00	0.02	0.59	2.57	0.01	0.05	0.58	0.13	0.01	0.00	**0.023**	**0.054**
TK-4: Produced Water Tank 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.000**	**0.000**
TK-8: Produced Water Tank 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.000**	**0.000**
PWLOAD					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.000**	**0.000**

GHG Emissions

Storage Tanks	Flashing Emissions		W/B Emissions		Total Uncontrolled Emissions		**2% Uncaptured at Tanks**		5% VRU Downtime routed to		**Controlled VRU Downtime**		**Total Emissions**	
	CH_4	CO_2e	CH_4	CO_2e	CH_4	CO_2e	**CH_4**	**CO_2e**	CH_4	CO_2e	**CH_4**	**CO_2e**	**CH_4**	**CO_2e**
	tpy	tpy	tpy	tpy	tpy	tpy	**tpy**	**tpy**	tpy	tpy	**tpy**	**tpy**	**tpy**	**tpy**
TK-1: Condensate Tank 1	0.46	0.00	0.02	0.00	0.48	0.00	0.01	0.00	0.47	0.00	0.01	0.00	**0.019**	**0.000**
TK-2: Condensate Tank 2	0.46	0.00	0.02	0.00	0.48	0.00	0.01	0.00	0.47	0.00	0.01	0.00	**0.019**	**0.000**
TK-3: Condensate Tank 3	0.46	0.00	0.02	0.00	0.48	0.00	0.01	0.00	0.47	0.00	0.01	0.00	**0.019**	**0.000**
TK-5: Condensate Tank 5	0.46	0.00	0.02	0.00	0.48	0.00	0.01	0.00	0.47	0.00	0.01	0.00	**0.019**	**0.000**
TK-6: Condensate Tank 6	0.46	0.00	0.02	0.00	0.48	0.00	0.01	0.00	0.47	0.00	0.01	0.00	**0.019**	**0.000**
TK-7: Condensate Tank 7	0.46	0.00	0.02	0.00	0.48	0.00	0.01	0.00	0.47	0.00	0.01	0.00	**0.019**	**0.000**
CONDLOAD					0.04	0.00	0.00	0.00	0.03	0.00	0.00	0.00	**0.001**	**0.000**
GB-1: Gunbarrel Tank	3.01	0.00	0.02	0.00	3.03	0.00	0.06	0.00	2.97	0.00	0.06	0.00	**0.120**	**0.000**
TK-4: Produced Water Tank 4	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	**0.001**	**0.000**
TK-8: Produced Water Tank 8	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	**0.001**	**0.000**
PWLOAD					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.000**	**0.000**

ECD Pilot Gas Combustion PTE
New Source Review Permit
Horned Frog Compressor Station
Delaware G&P, LLC

EPN	FIN	Description	Fuel Gas Flow Rate (scf/hr)	Fuel Higher Heating Value (Btu/scf)	Annual Operating Hours (hr/yr)	Pollutant	Emission Factors [a]	Units	Potential to Emit Hourly [a] (lb/hr)	Potential to Emit Annual [b] (T/yr)
ECD	ECD	Enclosed Combustion Device	30	1,111	8,760	NO_X	0.1380	lb/MMBtu	0.00460	0.020
						CO	0.2755	lb/MMBtu	0.009	0.04
						PM	-- c	--	--	--
						SO_2	0.00286	lb S/Mscf	0.00017	0.0008
						VOC	5.5	lb/MMscf	0.0002	0.001
						Benzene	0.0021	lb/MMscf	0.0000001	0.0000003

[a] Combustor emission factors for CO and NO_X are based upon the Draft TNRCC Guidance Document for Flares and Vapor Oxidizers (dated 03/21) for non-assisted high-Btu and low-Btu flares. An example calculation for hourly CO emissions for EPN ECD-1 follows:

CO (lb/hr) = (Fuel Flow Rate, scf/hr) * (Fuel Heating Value, Btu/scf) * (MM/106) * (Emission Factor, lb/MMBtu)

CO (lb/hr) = (30 scf/hr) * (1,111 Btu/scf)*(MM/10^6) * (0.2755 lb/MMBtu)

= 0.01 lb/hr CO

Sulfur content of 2 gr S/100 scf or 0.00286 lb S/Mscf is conservatively assumed for variance in field gas quality.

SO_2 (lb/hr) = (Fuel Flow Rate, scf/hr)/1000*(Sulfur Content, lb S/Mscf gas)*(64.06 lb SO_2/32.06 lb S)

SO2 (lb/hr) = (30 scf/hr) / (Mscf/1000scf) * (0.00286 lb S/Mscf gas) * (64.06 lb SO2/32.06 lb S)

= 0.00017 lb/hr SO_2

Emission factors for VOC and benzene are based upon AP-42 Tables 1.4-2 and 1.4-3 (dated 7/98). An example calculation for hourly VOC emissions for EPN FLARE-1 follows:

VOC (lb/hr) = (Fuel Flow Rate, scf/hr) * (MM/106) * (Emission Factor, lb/MMscf)

VOC (lb/hr) = (30 scf/hr) * (MM/10^6) * (5.5 lb/MMscf)

= 0.0002 lb/hr VOC

[b] An example calculation for annual CO emissions for EPN FLARE-1 follows:

CO (T/yr) = (Hourly Emissions, lb/hr) * (Annual Operating Hours, hr/yr) * (1 T/2,000 lb)

CO (T/yr) = (0.01 lb/hr) * (8,760 hr/yr) * (1 T/2,000 lb)

= 0.04 T/yr CO

[c] The process flares are smokeless per 40 CFR §60.18 requirements; therefore, PM emissions are negligible.

ECD Waste Gas Combustion PTE
New Source Review Permit
Horned Frog Compressor Station
Delaware G&P, LLC

EPN	Description	WG Max hourly Flow Rate [a] (Mscf/hr)	WG Annual Flow Rate (MMscf/yr	WG Higher Heating Value (Btu/scf)	Flare Feed Rate Hourly (MMBtu/hr)	Flare Feed Rate Annual (MMBtu/yr)	Annual Operating Hours (hr/yr)	Pollutant	Emission Factors [b]	Units	Potential to Emit [e] Hourly [b] (lb/hr)	Potential to Emit [e] Annual [c] (T/yr)
ECD	5% VRU Downtime	2.237	1.15	1,364.00	3.05	1,571.85	8,760	NO_x	0.1380	lb/MMBtu	0.42	0.11
								CO	0.2755	lb/MMBtu	0.84	0.22
								PM	-- d	--	--	--
								SO_2	8.57E-05	lb S/hr	1.61E-04	7.06E-04
							GWP				**tpy**	**tpy CO_2e**
							1	CO_2[5]	53.0600	kg/MMBtu	183869.93	183869.93
							298	N_2O[5]	0.0001	kg/MMBtu	0.35	103.27
							25	CH_4[5]	0.0010	kg/MMBtu	3.47	86.63
								CO_2e[5]			183873.75	184059.83

[a] The WG flow rate, heating value, and feed rates taken from the following sources: TK-1 to TK-8, GB-1 (Flashing, working, and breathing), DEHY1 & DEHY2 (Flash tank), Condensate Loading, Produced Water Loading.Hourly flow rate is the maximum flow rate in an hour during VRU downtime, annual flow rate is base on maximum flow for 5% of the year or 438 hours a year.

[b] Emission factors for CO and NO_x are based upon the Draft TNRCC Guidance Document for Flares and Vapor Oxidizers (dated 03/21) for non-assisted high or low Btu flares, as appropriate. Thermal oxidizer emission factors for CO, NO_x and PM are based on AP-42 Table 1.4-2 (dated 7/98) and converted assuming a natural gas heating value of 1,020 Btu/scf. An example calculation for hourly CO emissions for EPN ECD follows:

CO (lb/hr) = (Flare Feed Rate, MMBtu/hr) * (Emission Factor, lb/MMBtu)
CO (lb/hr) = (3.05 MMBtu/hr) * (0.2755 lb/MMBtu)
= 0.84 lb/hr CO

SO_2 emission rates for

SO_2 (lb/hr) = (Emission Factor, lb/hr S) * (64.06 lb SO_2 /34.08 lb S)
SO_2 (lb/hr) = (0.0001 lb/hr S) * (64.06 lb SO2 /34.08 lb S)
= 1.61E-04 lb/hr SO_2

[c] An example calculation for annual CO emissions for EPN FLARE-1 follows:

CO (T/yr) = (Flare Feed Rate, MMBtu/yr) * (Emission Factor, lb/MMBtu) / (2,000 lb/T)
CO (T/yr) = (1,571.85 MMBtu/yr) * (0.2755 lb/MMBtu) / (2,000 lb/T)
= 0.22 T/yr CO

[d] The process flares are smokeless per 40 CFR §60.18 requirements; therefore, PM emissions are negligible.

[e] Waste gas emissions of VOC and benzene are represented at the FIN that generates the emissions.

Enclosed Combustion Device Emission Summary
New Source Review Permit
Horned Frog Compressor Station
Delaware G&P, LLC

EPN	FIN	Description	Pollutant	Pilot Gas Potential to Emit [a] Hourly (lb/hr)	Pilot Gas Potential to Emit [a] Annual (T/yr)	Waste Gas Potential to Emit [b] Hourly (lb/hr)	Waste Gas Potential to Emit [b] Annual (T/yr)	Total Potential to Emit Hourly (lb/hr)	Total Potential to Emit Annual (T/yr)
ECD	ECD Pilot	Enclosed Combustor	CO	0.00	0.02	0.42	0.11	0.43	0.13
	VRU downtime		NO_X	0.009	0.04	0.84	0.22	0.85	0.26
			PM	--	--	--	--	--	--
			SO_2	0.00017	0.0008	0.000	0.00	0.000	0.00
			VOC (Pilot)	0.0002	0.001	--	--	0.0002	0.001
			Benzene (Pilot)	0.0000001	0.0000003	--	--	0.0000001	0.0000003

[a] The Pilot Gas Potential to Emit emissions are from the Flare Pilot Gas Combustion Potential to Emit worksheet.

[b] The Waste Gas Potential to Emit CO, NO_X, and SO_2 emissions are from the Flare Waste Gas Combustion Potential to Emit worksheet. Emissions from Periodic Events are not included in the Waste Gas Potential to Emit, but are shown on the Summary of Site-Wide Allowable Emission Rates table. VOC and benzene emissions from the storage tanks, loading, amine units, dehydration unit and blowdown waste gas are reported at their respective emission paths.

Fugitive Calculations
New Source Review Permit
Horned Frog Compressor Station
Delaware G&P, LLC

Component	Number of Components	Emission Factors [a] (lb/hr-component)	Annual Operating Hours (hr/yr)	Maximum VOC (wt%)	Maximum Total HAP (wt%)	Maximum Benzene (wt%)	Maximum Carbon Dioxide (wt%)	Maximum Methane (wt%)	Potential To Emit							
									VOC		Total HAP		Benzene		Carbon Dioxide	Methane
									Hourly [b] (lb/hr)	Annual [c] (T/yr)	Hourly [b] (lb/hr)	Annual [c] (T/yr)	Hourly [b] (lb/hr)	Annual [c] (T/yr)	Annual [c] (T/yr)	Annual [c] (T/yr)
Valves																
Gas Stream (Inlet Gas)	394	0.009921	8,760	31.26%	0.86%	0.10%	1.70%	48.10%	1.2217	5.3512	0.03350	0.1467	0.0039	0.0171	0.2918	8.2357
Heavy Liquid	18	0.0000185	8,760	100.00%	0.00%	0.00%	0.00%	0.02%	0.0003	0.0015	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Light Liquid Streams	117	0.005512	8,760	100.00%	13.06%	0.10%	0.00%	0.02%	0.6449	2.8247	0.084248	0.36901	0.0006	0.0028	0.0000	0.0006
Water/Light Liquid Streams	132	0.000216	8,760	100.00%	0.00%	0.00%	0.00%	0.00%	0.0285	0.1249	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pump Seals																
Light Liquid Streams	2	0.02866	8,760	100.00%	13.06%	0.10%	0.00%	0.02%	0.0573	0.2511	0.0075	0.0328	0.0001	0.0003	0.0000	0.0001
Water/Light Liquid Streams	3	0.000053	8,760	100.00%	0.0000%	0.00%	0.00%	0.00%	0.0002	0.0007	0.000000	0.00000	0.0000	0.0000	0.0000	0.0000
Flanges																
Gas Stream (Inlet Gas)	650	0.00086	8,760	31.26%	0.86%	0.10%	1.70%	48.10%	0.1747	0.7653	0.0048	0.0210	0.0006	0.0024	0.0417	1.1778
Heavy Liquid	8	0.00000086	8,760	100.00%	0.00%	0.00%	0.00%	0.02%	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Light Liquid Streams	324	0.000243	8,760	100.00%	13.06%	0.10%	0.00%	0.02%	0.0787	0.3448	0.0103	0.0450	0.0001	0.0003	0.0000	0.0001
Water/Light Liquid Streams	122	0.0000064	8,760	100.00%	0.00%	0.00%	0.00%	0.00%	0.0008	0.0034	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Open Ended Lines																
Gas Stream (Inlet)	21	0.00441	8,760	31.26%	0.86%	0.10%	1.70%	48.10%	0.0289	0.1268	0.0008	0.0035	0.0001	0.0004	0.0069	0.1951
Heavy Liquid	10	0.000309	8,760	100.00%	0.00%	0.00%	0.00%	0.02%	0.0031	0.0135	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Light Liquid	15	0.003087	8,760	100.00%	13.06%	0.10%	0.00%	0.02%	0.0463	0.2028	0.0060	0.0265	0.0000	0.0002	0.0000	0.0000
Water/Light Liquid Streams	2	0.0000551	8,760	100.00%	0.00%	0.00%	0.00%	0.00%	0.0001	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Connectors																
Gas Stream (Inlet Gas)	975	0.000441	8,760	31.26%	0.86%	0.10%	1.70%	48.10%	0.1344	0.5886	0.0037	0.0161	0.0004	0.0019	0.0321	0.9059
Heavy Liquid	12	0.0000165	8,760	100.00%	0.00%	0.00%	0.00%	0.02%	0.0002	0.0009	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Light Liquid Streams	486	0.000463	8,760	100.00%	13.06%	0.10%	0.00%	0.02%	0.2250	0.9856	0.029396	0.12875	0.0002	0.0010	0.0000	0.0002
Water/Light Liquid Streams	183	0.000243	8,760	100.00%	0.00%	0.00%	0.00%	0.00%	0.0445	0.1948	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other																
Gas Stream (Inlet Gas)	104	0.019401	8,760	31.26%	0.86%	0.10%	1.70%	48.10%	0.6306	2.7622	0.0173	0.0757	0.0020	0.0088	0.1506	4.2512
Heavy Liquid	4	0.0000706	8,760	100.00%	0.00%	0.00%	0.00%	0.02%	0.0003	0.0012	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Light Liquid Streams	7	0.016535	8,760	100.00%	13.06%	0.10%	0.00%	0.02%	0.1157	0.5070	0.015121	0.06623	0.0001	0.0005	0.0000	0.0001
Water/Light Liquid Streams	2	0.030865	8,760	100.00%	0.00%	0.00%	0.00%	0.00%	0.0617	0.2704	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
							Gas Stream (Inlet Gas) Total:		2.1904	9.5940	0.0601	0.2630	0.0070	0.0307	0.5231	14.7657
							Heavy Liquid Stream Total:		0.0039	0.0171	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
							Light Liquid Stream Total:		1.1680	5.1159	0.1526	0.6683	0.0012	0.0051	0.0000	0.0010
							Water/Light Liquid Streams Total:		0.1358	0.5946	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
							TOTALS:		**3.50**	**15.32**	**0.21**	**0.93**	**0.01**	**0.04**	**0.52**	**14.77**

[a] Fugitive Emission Factors are per EPA Protocal for Equipment Leak Emission Estimates Table 2-4. The emission factors are for total hydrocarbon.

[b] Hourly VOC emission rates are calculated as follows:
(394 components) * (0.00992 lb/hr-component) * (31.26% VOC) * (100% - 0% reduction credit) = 1.2217 lb/hr

[c] Annual VOC emission rates are calculated as follows:
(394 components) * (0.00992 lb/hr-component) * (8,760 hr/yr) * (31.26% VOC) * (100% - 0% reduction credit) / (2,000 lb/T) = 5.3512 T/yr

Haul Road Calculations
New Source Review Permit
Horned Frog Compressor Station
Delaware G&P, LLC

FIN	EPN	% Silt	Mean Vehicle	Rain Days	Haul Road Distance	Number of Haul Road Per Hour	Number of Haul Road Year	Vehicle Miles Traveled (VMT/hour)	Vehicle Miles Traveled (VMT/year)	Hourly Size-Specific TSP	Hourly Size-Specific PM-10	Hourly Size-Specific PM-2.5	Annual Size-Specific TSP	Annual Size-Specific PM-10	Annual Size-Specific PM-2.5	Emission Rates TSP (lb/hr)	Emission Rates TSP (Tons)	Emission Rates PM-10 (lb/hr)	Emission Rates PM-10 (Tons)	Emission Rates PM-2.5 (lb/hr)	Emission Rates PM-2.5 (Tons)
(COND &PW)	HR-1	4.8	40.0	70	0.30	1	1,204	0.30	361.20	8.28	2.11	0.21	6.69	1.70	0.17	2.48	1.21	0.63	0.31	0.06	0.03

Notes:

1. Calculation method and factors are from AP-42, Section 13.2 (11/2006).

2. The entries for % Silt and Rain Days are the NMED accepted default values.

3. The Haul Road Distance only includes the round-trip distance within the facility boundaries per NMED protocol.

Sample Calculations: (based on PM-10)

Emission Factors:

Hourly Size-Specific Emission Factor = k * [(surface material silt content, %)/12]^a * [(mean vehicle weight, tons)/3]^b
where k, a, and b are empirical constants from AP-42 Table 13.2.2-2 for industrial roads.
= 1.5 lb/VMT * [(4.8 %) / 12]^0.9 * [(40.0 tons) / 3]^0.45
= 2.11 lb/VMT where VMT = vehicle miles traveled

Annual Size-Specific Emission Factor = Hourly Size-Specific Emission Factor * [(365 - Rain Days) / 365]
where Rain Days = # of days in a year with at least 0.01 inches of precipitation.
= 2.11 lbs/VMT * [(365 - 70 days / 365 days]
= 1.70 lb/VMT where VMT = vehicle miles traveled

Emissions:

Hourly Emissions = Hourly Size-Specific Emission Factor * Vehicle Miles Traveled per Hour
= 2.11 lbs/VMT * 0.30 VMT/hour
= 0.63 lb/hr

Annual Emissions = Annual Size-Specific Emission Factor * Vehicle Miles Traveled per Year
= 1.70 lbs/VMT * 361.20 VMT/year
= 0.31 Tons

Compressor Engine Blowdowns
New Source Review Permit
Horned Frog Compressor Station
Delaware G&P, LLC

Description	Total PTE	E-1	E-2	E-4	E-5	E-6	E-7	E-8	E-9	E-10
Number of Blowdowns per Year		26	26	52	52	52	52	52	52	52
Number of Blowdowns per Hour		1	1	1	1	1	1	1	1	1
Blowdown Volume per Event, scf		2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Gas Stream Specific Gravity		0.8162	0.8162	0.8162	0.8162	0.8162	0.8162	0.8162	0.8162	0.8162
Air MW, lb/mole		23.53	23.53	23.53	23.53	23.53	23.53	23.53	23.53	23.53
Gas Stream Density, lb/scf [a]		0.051	0.051	0.051	0.051	0.051	0.051	0.051	0.051	0.051
Max VOC Percentage in Gas Stream, wt%		31.26%	31.26%	31.26%	31.26%	31.26%	31.26%	31.26%	31.26%	31.26%
Max HAP Percentage in Gas Stream, wt%		0.86%	0.86%	0.86%	0.86%	0.86%	0.86%	0.86%	0.86%	0.86%
Max Methane Percentage in Gas Stream, wt%		48.10%	48.10%	48.10%	48.10%	48.10%	48.10%	48.10%	48.10%	48.10%
Max CO_2 Percentage in Gas Stream, wt%		1.70%	1.70%	1.70%	1.70%	1.70%	1.70%	1.70%	1.70%	1.70%
Max Benzene Percentage in Gas Stream, wt%		0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%
Hourly VOC Emission Rates (lb/hr): [b]	**63.34**	31.67	31.67	31.67	31.67	31.67	31.67	31.67	31.67	31.67
Annual VOC Emission Rates (T/yr): [c]	**6.59**	0.412	0.412	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Hourly HAP Emission Rates (lb/hr):[b]	**1.74**	0.8683	0.8683	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Annual HAP Emission Rates (T/yr): [c]	**0.18**	0.011289	0.011289	0.02	0.02	0.0226	0.02	0.02	0.0226	0.02
Annual Methane Emission Rates (T/yr): [c]	**10.14**	0.63	0.63	1.27	1.27	1.27	1.27	1.27	1.27	1.27
Annual CO_2 Emission Rates (T/yr): [c]	**0.36**	0.0224	0.0224	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Hourly Benzene Emission Rates (lb/hr):[b]	**0.20**	0.101	0.101	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Annual Benzene Emission Rates (T/yr): [c]	**0.02**	0.00132	0.00132	0.0026	0.0026	0.003	0.0026	0.0026	0.003	0.0026

lb/hr rates assume a max of 2 engines can blowdown simultaneously.

[a] Gas stream density is calculated as follows:

(23.53 lb/mole) / (379 scf/mole) * (0.8162) = 0.051 lb/scf

[b] Hourly blowdown VOC emission rates are calculated as follows:

(1 blowdown/hr) * (2,000 scf/blowdown) * (0.051 lb/scf) * (31.26% VOC) * (1 - 0.00) = 31.67 lb/hr

[c] Annual blowdown VOC emission rates are calculated as follows:

(26 blowdowns/yr) * (2,000 scf/blowdown) * (0.051 lb/scf) * (31.26% VOC) / (2,000 lb/T) * (1 - 0.00) = 0.41 T/yr

Compressor Engine Starter Vents
New Source Review Permit
Horned Frog Compressor Station
Delaware G&P, LLC

Description	Total PTE	C-1	C-3	C-5	C-6	C-7	C-8	C-9	C-10	C-11
Number of Starts per Year		156	156	156	156	156	156	156	156	156
Number of Starts per Hour		1	1	1	1	1	1	1	1	1
Starter Vent Volume per Event, scf		900	900	900	900	900	900	900	900	900
Gas Stream Specific Gravity		0.8162	0.8162	0.8162	0.8162	0.8162	0.8162	0.8162	0.8162	0.8162
Air MW, lb/mole		23.53	23.53	23.53	23.53	23.53	23.53	23.53	23.53	23.53
Gas Stream Density, lb/scf [a]		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Max VOC Percentage in Gas Stream, wt%		31.26%	31.26%	31.26%	31.26%	31.26%	31.26%	31.26%	31.26%	31.26%
Max HAP Percentage in Gas Stream, wt%		0.86%	0.86%	0.86%	0.86%	0.86%	0.86%	0.86%	0.86%	0.86%
Max Methane Percentage in Gas Stream, wt%		48.10%	48.10%	48.10%	48.10%	48.10%	48.10%	48.10%	48.10%	48.10%
Max CO_2 Percentage in Gas Stream, wt%		1.70%	1.70%	1.70%	1.70%	1.70%	1.70%	1.70%	1.70%	1.70%
Max Benzene Percentage in Gas Stream, wt%		0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%
Hourly VOC Emission Rates (lb/hr): [b]	**28.50**	14.25	14.25	14.25	14.25	14.25	14.25	14.25	14.25	14.25
Annual VOC Emission Rates (T/yr): [c]	**10.00**	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Hourly HAP Emission Rates (lb/hr):[b]	**0.78**	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39
Annual HAP Emission Rates (T/yr): [c]	**0.27**	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Annual Methane Emission Rates (T/yr): [c]	**15.40**	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71
Annual CO_2 Emission Rates (T/yr): [c]	**0.55**	0.061	0.061	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Hourly Benzene Emission Rates (lb/hr):[b]	**0.09**	0.046	0.046	0.046	0.046	0.046	0.046	0.046	0.046	0.046
Annual Benzene Emission Rates (T/yr): [c]	**0.03**	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036

lb/hr rates assume a max of 2 engines will start up simultaneously.

[a] Gas stream density is calculated as follows:

(23.53 lb/mole) / (379 scf/mole) * (0.8162) = 0.05 lb/scf

[b] Hourly starter vent VOC emission rates are calculated as follows:

(1 starts/hr) * (900 scf/start) * (0.051 lb/scf) * (31.26% VOC) = 14.25 lb/hr

[c] Annual starter vent VOC emission rates are calculated as follows:

(156 starts/yr) * (900 scf/start) * (0.051 lb/scf) * (31.26% VOC) / (2,000 lb/T) = 1.11 T/yr

Miscellaneous SSM
New Source Review Permit
Horned Frog Compressor Station
Delaware G&P, LLC

Description	Total PTE	DEHYS	Filter Coalescer	Scrubbers	Pumps	Reboiler Maintenance	Pipeline Maintenance	Tank Degassing
Number of Blowdowns per Year		2	1	5	8	2	1	8
Simultaneous blowdowns per hour		1	1	5	2	1	1	1
Volume of Gas Per Blowdown		18,318.79	900	3,380	16	65	54,874	4,323
Gas Stream Specific Gravity		0.8162	0.8162	0.8162	0.8162	0.8162	0.8162	0.8162
Air MW, lb/mole		23.53	23.53	23.53	23.53	23.53	23.53	70.00
Gas Stream Density, lb/scf [a]		0.05	0.05	0.05	0.05	0.05	0.05	0.15
Flare Control Efficiency, %		0%	0%	0%	0%	0%	0%	0%
Max VOC Percentage in Gas Stream, wt%		31.26%	31.26%	31.26%	31.26%	31.26%	31.26%	31.26%
Max HAP Percentage in Gas Stream, wt%		0.86%	0.86%	0.86%	0.86%	0.86%	0.86%	0.86%
Max Methane Percentage in Gas Stream, wt%		48.10%	48.10%	48.10%	48.10%	48.10%	48.10%	48.10%
Max CO_2 Percentage in Gas Stream, wt%		1.70%	1.70%	1.70%	1.70%	1.70%	1.70%	1.70%
Max Benzene Percentage in Gas Stream, wt%		0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%
Hourly VOC Emission Rates (lb/hr): [b]	**1646.14**	290.09	14.25	267.62	0.51	1.03	868.96	203.68
Annual VOC Emission Rates (T/yr): [c]	**1.68**	0.29	0.01	0.13	0.00	0.00	0.43	0.81
Hourly HAP Emission Rates (lb/hr):[b]	**45.13**	7.95	0.39	7.34	0.01	0.03	23.82	5.58
Annual HAP Emission Rates (T/yr): [c]	**0.05**	0.01	0.00	0.00	0.00	0.00	0.01	0.02
Annual Methane Emission Rates (T/yr): [c]	**2.59**	0.45	0.01	0.21	0.00	0.00	0.67	1.25
Annual CO_2 Emission Rates (T/yr): [c]	**0.09**	0.016	0.00	0.01	0.00	0.00	0.02	0.04
Hourly Benzene Emission Rates (lb/hr):[b]	**5.27**	0.928	0.046	0.856	0.002	0.003	2.780	0.652
Annual Benzene Emission Rates (T/yr): [c]	**0.005**	0.0009	0.0000	0.0004	0.0000	0.0000	0.0014	0.0026

[a] Gas stream density is calculated as follows:

(23.53 lb/mole) / (379 scf/mole) * (0.8162) = 0.05 lb/scf

[b] Hourly starter vent VOC emission rates are calculated as follows:

(1 starts/hr) * (18319 scf/start) * (0.051 lb/scf) * (31.26% VOC) = 290.09 lb/hr

[c] Annual starter vent VOC emission rates are calculated as follows:

(2 starts/yr) * (18319 scf/start) * (0.051 lb/scf) * (31.26% VOC) / (2,000 lb/T) = 0.29 T/yr

SSM Summary
New Source Review Permit
Horned Frog Compressor Station
Delaware G&P, LLC

Description	VOC		Benzene		Total HAPs		Methane	Carbon Dioxide
	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(tpy)	(tpy)
Compressor Blowdowns	63.34	6.59	0.20	0.02	1.74	0.18	10.14	0.36
Compressor Starter Vents	28.50	10.00	0.09	0.03	0.78	0.27	15.40	0.55
Misc SSM	1646.14	1.68	5.27	5.38E-03	45.13	0.046	2.59	0.0917
TOTAL SSM	**1737.98**	**18.27**	**5.56**	**0.06**	**47.65**	**0.50**	**28.13**	**1.00**

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Section 6.a

Green House Gas Emissions

(Submitting under 20.2.70, 20.2.72 20.2.74 NMAC)

Title V (20.2.70 NMAC), Minor NSR (20.2.72 NMAC), and PSD (20.2.74 NMAC) applicants must estimate and report greenhouse gas (GHG) emissions to verify the emission rates reported in the public notice, determine applicability to 40 CFR 60 Subparts, and to evaluate Prevention of Significant Deterioration (PSD) applicability. GHG emissions that are subject to air permit regulations consist of the sum of an aggregate group of these six greenhouse gases: carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

Calculating GHG Emissions:

1. Calculate the ton per year (tpy) GHG mass emissions and GHG CO_2e emissions from your facility.
2. GHG mass emissions are the sum of the total annual tons of greenhouse gases without adjusting with the global warming potentials (GWPs). GHG CO_2e emissions are the sum of the mass emissions of each individual GHG multiplied by its GWP found in Table A-1 in 40 CFR 98 Mandatory Greenhouse Gas Reporting.
3. Emissions from routine or predictable start up, shut down, and maintenance must be included.
4. Report GHG mass and GHG CO_2e emissions in Table 2-P of this application. Emissions are reported in **short** tons per year and represent each emission unit's Potential to Emit (PTE).
5. All Title V major sources, PSD major sources, and all power plants, whether major or not, must calculate and report GHG mass and CO2e emissions for each unit in Table 2-P.
6. For minor source facilities that are not power plants, are not Title V, and are not PSD there are three options for reporting GHGs in Table 2-P: 1) report GHGs for each individual piece of equipment; 2) report all GHGs from a group of unit types, for example report all combustion source GHGs as a single unit and all venting GHGs as a second separate unit; 3) or check the following ☐ By checking this box, the applicant acknowledges the total CO2e emissions are less than 75,000 tons per year.

Sources for Calculating GHG Emissions:

- Manufacturer's Data
- AP-42 Compilation of Air Pollutant Emission Factors at http://www.epa.gov/ttn/chief/ap42/index.html
- EPA's Internet emission factor database WebFIRE at http://cfpub.epa.gov/webfire/
- 40 CFR 98 Mandatory Green House Gas Reporting except that tons should be reported in short tons rather than in metric tons for the purpose of PSD applicability.
- API Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry. August 2009 or most recent version.
- Sources listed on EPA's NSR Resources for Estimating GHG Emissions at http://www.epa.gov/nsr/clean-air-act-permitting-greenhouse-gases:

Global Warming Potentials (GWP):
Applicants must use the Global Warming Potentials codified in Table A-1 of the most recent version of 40 CFR 98 Mandatory Greenhouse Gas Reporting. The GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to that of one unit mass of CO_2 over a specified time period.

"Greenhouse gas" for the purpose of air permit regulations is defined as the aggregate group of the following six gases: carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. **(20.2.70.7 NMAC, 20.2.74.7 NMAC).** You may also find GHGs defined in 40 CFR 86.1818-12(a).

Metric to Short Ton Conversion:
Short tons for GHGs and other regulated pollutants are the standard unit of measure for PSD and title V permitting programs. 40 CFR 98 Mandatory Greenhouse Reporting requires metric tons.
1 metric ton = 1.10231 short tons (per Table A-2 to Subpart A of Part 98 – Units of Measure Conversions)

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Section 7

Information Used to Determine Emissions

Information Used to Determine Emissions shall include the following:

- ☒ If manufacturer data are used, include specifications for emissions units and control equipment, including control efficiencies specifications and sufficient engineering data for verification of control equipment operation, including design drawings, test reports, and design parameters that affect normal operation.
- ☐ If test data are used, include a copy of the complete test report. If the test data are for an emissions unit other than the one being permitted, the emission units must be identical. Test data may not be used if any difference in operating conditions of the unit being permitted and the unit represented in the test report significantly effect emission rates.
- ☒ If the most current copy of AP-42 is used, reference the section and date located at the bottom of the page. Include a copy of the page containing the emissions factors, and clearly mark the factors used in the calculations.
- ☐ If an older version of AP-42 is used, include a complete copy of the section.
- ☒ If an EPA document or other material is referenced, include a complete copy.
- ☒ Fuel specifications sheet.
- ☒ If computer models are used to estimate emissions, include an input summary (if available) and a detailed report, and a disk containing the input file(s) used to run the model. For tank-flashing emissions, include a discussion of the method used to estimate tank-flashing emissions, relative thresholds (i.e., permit or major source (NSPS, PSD or Title V)), accuracy of the model, the input and output from simulation models and software, all calculations, documentation of any assumptions used, descriptions of sampling methods and conditions, copies of any lab sample analysis.

Supporting documentation is attached to this section.

ProMax Dehydration Emissions Report

Case Name:	25 MMSCFD
File Name:	C:\Users\Admin\Resolute Compliance, LLC\Environmental Compliance - General\Env\Projects\Env-EnLink-0254\5.0 Air Permit-Horned Frog CS NSR\5.2 Modeling\5.2.2 BRE ProMax-Other Simulation\ProMax_Dehydration_Tool.pmx
Date:	
Description:	

Dry Gas Flow Rate	24.71	MMSCFD
Dry Gas Water Content	3.20	lb/MMSCF
Glycol Circulation Rate	7.00	sgpm
Glycol Circulation Ratio	5.87	gal/lb
Annual Operating Hours	8760	hrs

INPUT SUMMARY:

Feed Stream Specifications	
Fraction of Water Saturaton (%)	100.00
Water Content (lbm/MMSCF)	69.22
Temperature (°F)	110.00
Pressure (psig)	1100.00
Flow Rate (MMSCFD)	25.01

Lean Glycol Specifications	
Glycol Circulation Rate (sgpm)	7.00

Regenerator Specifications	
Reboiler Temperature (°F)	400.000
Overhead Vapors	To Control Device
Is Reflux Coil Present?	Yes

Flash Tank Specifications	
Is Flash Tank Present?	Flash Tank Present
Temperature (°F)	160.00
Pressure (psig)	45.00
Flash Gas	Vent To Atmosphere

Stripping Gas Specifications	
Nitrogen (scfm)	Not In Use
Dry gas (scfm)	Not In Use

Kimray Pump Specifications	
Type	Gas Injection
Gas Injection Volume Ratio (acfm/gpm)	0.001

Methanol Specifications	
Is Methanol Present?	Not Present in Feed
MeOH Feed Mass Fraction (ppm)	0.00

BTEX Condenser Specifications	
Temperature (°F)	120.00
Pressure (psig)	-0.30
BTEX Emissions	To Flare

General Specifications	
Atmospheric Pressure (psia)	14.400
Flash Gas Flare Destruction Efficiency (%)	95.000
Regenerator Flare Destruction Efficiency (%)	98.000

Feed Composition Data (mol %)	
Carbon Dioxide	0.9115
Hydrogen Sulfide	0.0000
Nitrogen	1.6267
Methane	70.5837
Ethane	13.3096
Propane	7.6136
i-Butane	1.0396
n-Butane	2.6978
i-Pentane	0.6018
n-Pentane	0.7088
Cyclopentane	0.0000
n-Hexane	0.6632
Cyclohexane	0.0000
n-Heptane	0.2041
Methylcyclohexane	0.0000
2,2,4-Trimethylpentane	0.0000
Benzene	0.0236
Toluene	0.0123
Ethylbenzene	0.0004
o-Xylene	0.0006
m-Xylene	0.0024
p-Xylene	0.0002
Triethylene Glycol	0.0000
Ethylene Glycol	0.0000
Water	0.0000
Methanol	0.0000
O2	0.0000
SO2	0.0000
Total	100.00

EMISSIONS REPORTS:

CONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Carbon Dioxide	62.33	1496.03	273.03
Hydrogen Sulfide	0.00	0.00	0.00
Nitrogen	622.50	14939.97	2726.54
Methane	0.01	0.24	0.04
Ethane	0.03	0.61	0.11
Propane	0.05	1.26	0.23
i-Butane	0.01	0.30	0.05
n-Butane	0.06	1.43	0.26
i-Pentane	0.02	0.56	0.10
n-Pentane	0.04	0.87	0.16
Cyclopentane	0.00	0.00	0.00
n-Hexane	0.06	1.50	0.27
Cyclohexane	0.00	0.00	0.00
n-Heptane	0.02	0.57	0.10
Methylcyclohexane	0.00	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00	0.00
Benzene	0.06	1.52	0.28
Toluene	0.03	0.72	0.13
Ethylbenzene	0.00	0.01	0.00
o-Xylene	0.00	0.02	0.00
m-Xylene	0.00	0.07	0.01
p-Xylene	0.00	0.01	0.00
Triethylene Glycol	0.00	0.00	0.00
Ethylene Glycol	0.00	0.00	0.00
Water	27.91	669.83	122.24
Methanol	0.00	0.00	0.00
O2	120.41	2889.83	527.39
SO2	0.00	0.00	0.00
Total Emissions	833.56	20005.35	3650.98
Total HC Emissions	0.40	9.68	1.77
Total VOC Emissions	0.37	8.83	1.61
Total HAP Emissions	0.16	3.85	0.70
Total GHG Emissions	62.34	1496.27	273.07

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Carbon Dioxide	0.98	23.48	4.29
Hydrogen Sulfide	0.00	0.00	0.00
Nitrogen	0.00	0.05	0.01
Methane	0.49	11.84	2.16
Ethane	1.28	30.72	5.61
Propane	2.66	63.85	11.65
i-Butane	0.64	15.26	2.78
n-Butane	3.07	73.74	13.46
i-Pentane	1.28	30.60	5.58
n-Pentane	2.02	48.41	8.84
Cyclopentane	0.00	0.00	0.00
n-Hexane	4.10	98.51	17.98
Cyclohexane	0.00	0.00	0.00
n-Heptane	2.25	54.09	9.87
Methylcyclohexane	0.00	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00	0.00
Benzene	4.83	115.92	21.16
Toluene	3.83	91.94	16.78
Ethylbenzene	0.14	3.27	0.60
o-Xylene	0.26	6.22	1.14
m-Xylene	0.82	19.71	3.60
p-Xylene	0.07	1.56	0.28
Triethylene Glycol	0.02	0.39	0.07
Ethylene Glycol	0.00	0.00	0.00
Water	67.93	1630.35	297.54
Methanol	0.00	0.00	0.00
O2	0.00	0.00	0.00
SO2	0.00	0.00	0.00
Total Emissions	96.66	2319.91	423.38
Total HC Emissions	27.75	666.02	121.55
Total VOC Emissions	25.98	623.46	113.78
Total HAP Emissions	14.05	337.12	61.52
Total GHG Emissions	1.47	35.33	6.45

CONTROLLED FLASH TANK EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Carbon Dioxide	0.00	0.00	0.00
Hydrogen Sulfide	0.00	0.00	0.00
Nitrogen	0.00	0.00	0.00
Methane	0.00	0.00	0.00
Ethane	0.00	0.00	0.00
Propane	0.00	0.00	0.00
i-Butane	0.00	0.00	0.00
n-Butane	0.00	0.00	0.00
i-Pentane	0.00	0.00	0.00
n-Pentane	0.00	0.00	0.00
Cyclopentane	0.00	0.00	0.00
n-Hexane	0.00	0.00	0.00
Cyclohexane	0.00	0.00	0.00
n-Heptane	0.00	0.00	0.00
Methylcyclohexane	0.00	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00	0.00
Benzene	0.00	0.00	0.00
Toluene	0.00	0.00	0.00
Ethylbenzene	0.00	0.00	0.00
o-Xylene	0.00	0.00	0.00
m-Xylene	0.00	0.00	0.00
p-Xylene	0.00	0.00	0.00
Triethylene Glycol	0.00	0.00	0.00
Ethylene Glycol	0.00	0.00	0.00
Water	0.00	0.00	0.00
Methanol	0.00	0.00	0.00
O2	0.00	0.00	0.00
SO2	0.00	0.00	0.00
Total Emissions	0.00	0.00	0.00
Total HC Emissions	0.00	0.00	0.00
Total VOC Emissions	0.00	0.00	0.00
Total HAP Emissions	0.00	0.00	0.00
Total GHG Emissions	0.00	0.00	0.00

UNCONTROLLED FLASH TANK OFF GAS

Component	lbs/hr	lbs/day	tons/yr
Carbon Dioxide	3.38	81.01	14.78
Hydrogen Sulfide	0.00	0.00	0.00
Nitrogen	0.21	5.08	0.93
Methane	14.03	336.77	61.46
Ethane	11.00	263.98	48.18
Propane	12.17	292.04	53.30
i-Butane	2.15	51.66	9.43
n-Butane	7.18	172.32	31.45
i-Pentane	1.91	45.77	8.35
n-Pentane	2.54	60.93	11.12
Cyclopentane	0.00	0.00	0.00
n-Hexane	2.52	60.39	11.02
Cyclohexane	0.00	0.00	0.00
n-Heptane	0.86	20.60	3.76
Methylcyclohexane	0.00	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00	0.00
Benzene	0.25	6.04	1.10
Toluene	0.11	2.68	0.49
Ethylbenzene	0.00	0.06	0.01
o-Xylene	0.00	0.09	0.02
m-Xylene	0.01	0.35	0.06
p-Xylene	0.00	0.03	0.01
Triethylene Glycol	0.00	0.08	0.01
Ethylene Glycol	0.00	0.00	0.00
Water	0.36	8.73	1.59
Methanol	0.00	0.00	0.00
O2	0.00	0.00	0.00
SO2	0.00	0.00	0.00
Total Emissions	58.69	1408.61	257.07
Total HC Emissions	54.74	1313.78	239.77
Total VOC Emissions	29.71	713.03	130.13
Total HAP Emissions	2.90	69.63	12.71
Total GHG Emissions	17.41	417.79	76.25

COMBINED REGENERATOR VENT/FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Carbon Dioxide	65.71	1577.04	287.81
Hydrogen Sulfide	0.00	0.00	0.00
Nitrogen	622.71	14945.05	2727.47
Methane	14.04	337.01	61.50
Ethane	11.02	264.59	48.29
Propane	12.22	293.30	53.53
i-Butane	2.16	51.95	9.48
n-Butane	7.24	173.74	31.71
i-Pentane	1.93	46.34	8.46
n-Pentane	2.58	61.80	11.28
Cyclopentane	0.00	0.00	0.00
n-Hexane	2.58	61.88	11.29
Cyclohexane	0.00	0.00	0.00
n-Heptane	0.88	21.16	3.86
Methylcyclohexane	0.00	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00	0.00
Benzene	0.31	7.56	1.38
Toluene	0.14	3.40	0.62
Ethylbenzene	0.00	0.07	0.01
o-Xylene	0.00	0.11	0.02
m-Xylene	0.02	0.42	0.08
p-Xylene	0.00	0.04	0.01
Triethylene Glycol	0.00	0.08	0.01
Ethylene Glycol	0.00	0.00	0.00
Water	28.27	678.56	123.84
Methanol	0.00	0.00	0.00
O2	120.41	2889.83	527.39
SO2	0.00	0.00	0.00
Total Emissions	892.25	21413.95	3908.05
Total HC Emissions	55.14	1323.47	241.53
Total VOC Emissions	30.08	721.86	131.74
Total HAP Emissions	3.06	73.48	13.41
Total GHG Emissions	79.75	1914.06	349.32

EQUIPMENT REPORTS:

BTEX CONDENSER

Condenser Outlet Temperature:	120.00	deg. F
Condenser Pressure:	14.10	psia
Condenser Duty:	-0.07	MMBTU/hr
Hydrocarbon Recovery:	0.65	bbls/day
Produced Water:	4.60	bbls/day
VOC Control Efficiency:	29.11	%
HAP Control Efficiency:	42.97	%
BTEX Control Efficiency:	50.82	%
Dissolved Hydrocarbons in Water:	851.20	mg/L

Component	Emitted (wt. %)	Condensed (wt. %)
Carbon Dioxide	99.53	0.47
Hydrogen Sulfide	0.00	0.00
Nitrogen	99.97	0.03
Methane	99.92	0.08
Ethane	99.61	0.39
Propane	98.92	1.08
i-Butane	97.81	2.19
n-Butane	96.68	3.32
i-Pentane	92.13	7.87
n-Pentane	90.00	10.00
Cyclopentane	0.00	0.00
n-Hexane	76.06	23.94
Cyclohexane	0.00	0.00
n-Heptane	52.33	47.67
Methylcyclohexane	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00
Benzene	65.41	34.59
Toluene	39.20	60.80
Ethylbenzene	17.63	82.37
o-Xylene	17.96	82.04
m-Xylene	17.78	82.22
p-Xylene	18.13	81.87
Triethylene Glycol	0.00	100.00
Ethylene Glycol	0.00	0.00
Water	1.32	98.68
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00

ABSORBER

Absorber Stages:	3.00	
Dry Gas Dew Point:	3.20	lb H2O/MMSCF
Temperature:	120.00	deg. F
Pressure:	1119.40	psia
Dry Gas Flow Rate:	24.71	MMSCFD
TEG Losses with Dry Gas:	0.61	lb/hr
Wet Gas Water Content:	69.22	lb H2O/MMSCF
Lean Glycol Recirc. Ratio:	5.87	gal/lb H2O

Component	In Dry Gas (%)	Absorbed in Glycol (%)
Carbon Dioxide	99.61	0.39
Hydrogen Sulfide	-	-
Nitrogen	99.99	0.01
Methane	99.96	0.04
Ethane	99.89	0.11
Propane	99.84	0.16
i-Butane	99.83	0.17
n-Butane	99.76	0.24
i-Pentane	99.72	0.28
n-Pentane	99.65	0.35
Cyclopentane	-	-
n-Hexane	99.51	0.49
Cyclohexane	-	-
n-Heptane	99.29	0.71
Methylcyclohexane	-	-
2,2,4-Trimethylpentane	-	-
Benzene	88.35	11.65
Toluene	83.23	16.77
Ethylbenzene	80.55	19.45
o-Xylene	73.35	26.65
m-Xylene	79.88	20.12
p-Xylene	81.05	18.95
Triethylene Glycol	0.02	99.98
Ethylene Glycol	-	-
Water	3.11	96.89
Methanol	-	-
O2	-	-
SO2	-	-

FLASH TANK

	Flash Temperature:	160 deg. F
	Flash Pressure:	45 psig
Component	Flashed (wt. %)	Left in Glycol (wt. %)
Carbon Dioxide	77.53	22.47
Hydrogen Sulfide	0.00	0.00
Nitrogen	99.05	0.95
Methane	96.60	3.40
Ethane	89.58	10.42
Propane	82.06	17.94
i-Butane	77.20	22.80
n-Butane	70.03	29.97
i-Pentane	59.93	40.07
n-Pentane	55.73	44.27
Cyclopentane	0.00	0.00
n-Hexane	38.00	62.00
Cyclohexane	0.00	0.00
n-Heptane	27.58	72.42
Methylcyclohexane	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00
Benzene	4.94	95.06
Toluene	2.79	97.21
Ethylbenzene	1.72	98.28
o-Xylene	1.24	98.76
m-Xylene	1.67	98.33
p-Xylene	1.78	98.22
Triethylene Glycol	0.00	100.00
Ethylene Glycol	0.00	0.00
Water	0.35	99.65
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00

REGENERATOR

Component	Recovered in Glycol (%)	Distilled Overhead (%)
Carbon Dioxide	0.00	100.00
Hydrogen Sulfide	-	-
Nitrogen	0.00	100.00
Methane	0.00	100.00
Ethane	0.00	100.00
Propane	0.00	100.00
i-Butane	0.00	100.00
n-Butane	0.00	100.00
i-Pentane	0.00	100.00
n-Pentane	0.00	100.00
Cyclopentane	-	-
n-Hexane	0.00	100.00
Cyclohexane	-	-
n-Heptane	0.00	100.00
Methylcyclohexane	-	-
2,2,4-Trimethylpentane	-	-
Benzene	0.33	99.67
Toluene	1.38	98.62
Ethylbenzene	4.66	95.34
o-Xylene	9.10	90.90
m-Xylene	4.87	95.13
p-Xylene	4.40	95.60
Triethylene Glycol	100.00	0.00
Ethylene Glycol	-	-
Water	33.58	66.42
Methanol	-	-
O2	-	-
SO2	-	-

STREAM REPORTS:

WET GAS STREAM

Temperature:	110.00	deg F
Pressure:	1114.40	psia
Flow Rate:	24.77	MMSCFD

Component	Conc. (mol%)	Mass Flow (lb/h)
Carbon Dioxide	0.91	1092.83
Hydrogen Sulfide	0.00	0.00
Nitrogen	1.64	1246.90
Methane	70.89	30926.27
Ethane	13.28	10857.42
Propane	7.52	9017.17
i-Butane	1.01	1601.68
n-Butane	2.61	4121.16
i-Pentane	0.57	1115.00
n-Pentane	0.66	1298.92
Cyclopentane	0.00	0.00
n-Hexane	0.58	1347.88
Cyclohexane	0.00	0.00
n-Heptane	0.16	434.54
Methylcyclohexane	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00
Benzene	0.02	43.73
Toluene	0.01	23.77
Ethylbenzene	0.00	0.74
o-Xylene	0.00	1.06
m-Xylene	0.00	4.32
p-Xylene	0.00	0.36
Triethylene Glycol	0.00	0.00
Ethylene Glycol	0.00	0.00
Water	0.15	71.58
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	63205.33

DRY GAS STREAM

Temperature:	111.84	deg F
Pressure:	1109.40	psia
Flow Rate:	24.71	MMSCFD

Component	Conc. (mol%)	Mass Flow (lb/h)
Carbon Dioxide	0.91	1088.53
Hydrogen Sulfide	0.00	0.00
Nitrogen	1.64	1246.74
Methane	71.01	30913.14
Ethane	13.29	10845.63
Propane	7.52	9002.74
i-Butane	1.01	1598.97
n-Butane	2.61	4111.10
i-Pentane	0.57	1111.87
n-Pentane	0.66	1294.42
Cyclopentane	0.00	0.00
n-Hexane	0.57	1341.32
Cyclohexane	0.00	0.00
n-Heptane	0.16	431.45
Methylcyclohexane	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00
Benzene	0.02	38.65
Toluene	0.01	19.83
Ethylbenzene	0.00	0.60
o-Xylene	0.00	0.79
m-Xylene	0.00	3.48
p-Xylene	0.00	0.30
Triethylene Glycol	0.00	0.61
Ethylene Glycol	0.00	0.00
Water	0.01	3.29
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	63053.46

LEAN GLYCOL STREAM

Temperature:	120.00	deg F
Pressure:	1119.40	psia
Flow Rate:	7.00	sgpm

Component	Conc. (wt%)	Mass Flow (lb/h)
Carbon Dioxide	0.00	0.00
Hydrogen Sulfide	0.00	0.00
Nitrogen	0.00	0.00
Methane	0.00	0.00
Ethane	0.00	0.00
Propane	0.00	0.00
i-Butane	0.00	0.00
n-Butane	0.00	0.00
i-Pentane	0.00	0.00
n-Pentane	0.00	0.00
Cyclopentane	0.00	0.00
n-Hexane	0.00	0.00
Cyclohexane	0.00	0.00
n-Heptane	0.00	0.00
Methylcyclohexane	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00
Benzene	0.00	0.02
Toluene	0.00	0.05
Ethylbenzene	0.00	0.01
o-Xylene	0.00	0.03
m-Xylene	0.00	0.04
p-Xylene	0.00	0.00
Triethylene Glycol	99.13	3916.43
Ethylene Glycol	0.00	0.00
Water	0.87	34.34
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	3950.92

RICH GLYCOL STREAM

Temperature:	111.57	deg F
Pressure:	1114.40	psia
Flow Rate:	7.49	sgpm

Component	Conc. (wt%)	Mass Flow (lb/h)
Carbon Dioxide	0.11	4.35
Hydrogen Sulfide	0.00	0.00
Nitrogen	0.01	0.21
Methane	0.35	14.53
Ethane	0.30	12.28
Propane	0.36	14.83
i-Butane	0.07	2.79
n-Butane	0.25	10.25
i-Pentane	0.08	3.18
n-Pentane	0.11	4.56
Cyclopentane	0.00	0.00
n-Hexane	0.16	6.62
Cyclohexane	0.00	0.00
n-Heptane	0.08	3.11
Methylcyclohexane	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00
Benzene	0.12	5.10
Toluene	0.10	4.00
Ethylbenzene	0.00	0.15
o-Xylene	0.01	0.29
m-Xylene	0.02	0.88
p-Xylene	0.00	0.07
Triethylene Glycol	95.38	3915.82
Ethylene Glycol	0.00	0.00
Water	2.50	102.64
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	4105.64

FLASH TANK OFF GAS STREAM

Temperature:	160.00	deg F
Pressure:	59.40	psia
Flow Rate:	715.52	scfh

Component	Conc. (mol%)	Mass Flow (lb/h)
Carbon Dioxide	4.07	3.38
Hydrogen Sulfide	0.00	0.00
Nitrogen	0.40	0.21
Methane	46.39	14.03
Ethane	19.40	11.00
Propane	14.64	12.17
i-Butane	1.96	2.15
n-Butane	6.55	7.18
i-Pentane	1.40	1.91
n-Pentane	1.87	2.54
Cyclopentane	0.00	0.00
n-Hexane	1.55	2.52
Cyclohexane	0.00	0.00
n-Heptane	0.45	0.86
Methylcyclohexane	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00
Benzene	0.17	0.25
Toluene	0.06	0.11
Ethylbenzene	0.00	0.00
o-Xylene	0.00	0.00
m-Xylene	0.01	0.01
p-Xylene	0.00	0.00
Triethylene Glycol	0.00	0.00
Ethylene Glycol	0.00	0.00
Water	1.07	0.36
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	58.69

FLASH TANK GLYCOL STREAM

Temperature:	160.00	deg F
Pressure:	59.40	psia
Flow Rate:	7.22	sgpm

Component	Conc. (wt%)	Mass Flow (lb/h)
Carbon Dioxide	0.02	0.98
Hydrogen Sulfide	0.00	0.00
Nitrogen	0.00	0.00
Methane	0.01	0.49
Ethane	0.03	1.28
Propane	0.07	2.66
i-Butane	0.02	0.64
n-Butane	0.08	3.07
i-Pentane	0.03	1.28
n-Pentane	0.05	2.02
Cyclopentane	0.00	0.00
n-Hexane	0.10	4.10
Cyclohexane	0.00	0.00
n-Heptane	0.06	2.25
Methylcyclohexane	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00
Benzene	0.12	4.85
Toluene	0.10	3.88
Ethylbenzene	0.00	0.14
o-Xylene	0.01	0.29
m-Xylene	0.02	0.86
p-Xylene	0.00	0.07
Triethylene Glycol	96.76	3915.81
Ethylene Glycol	0.00	0.00
Water	2.53	102.27
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	4046.95

REGENERATOR OVERHEADS STREAM

Temperature:	206.70	deg F
Pressure:	14.10	psia
Flow Rate:	1602.13	scfh

Component	Conc. (mol%)	Mass Flow (lb/h)
Carbon Dioxide	0.53	0.98
Hydrogen Sulfide	0.00	0.00
Nitrogen	0.00	0.00
Methane	0.73	0.49
Ethane	1.01	1.28
Propane	1.43	2.66
i-Butane	0.26	0.64
n-Butane	1.25	3.07
i-Pentane	0.42	1.28
n-Pentane	0.66	2.02
Cyclopentane	0.00	0.00
n-Hexane	1.13	4.10
Cyclohexane	0.00	0.00
n-Heptane	0.53	2.25
Methylcyclohexane	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00
Benzene	1.46	4.83
Toluene	0.98	3.83
Ethylbenzene	0.03	0.14
o-Xylene	0.06	0.26
m-Xylene	0.18	0.82
p-Xylene	0.01	0.07
Triethylene Glycol	0.00	0.02
Ethylene Glycol	0.00	0.00
Water	89.32	67.93
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	96.66

BTEX CONDENSER VENT GAS STREAM

Temperature:	120.00	deg F
Pressure:	14.10	psia
Flow Rate:	157.44	scfh

Component	Conc. (mol%)	Mass Flow (lb/h)
Carbon Dioxide	5.33	0.97
Hydrogen Sulfide	0.00	0.00
Nitrogen	0.02	0.00
Methane	7.41	0.49
Ethane	10.22	1.27
Propane	14.39	2.63
i-Butane	2.58	0.62
n-Butane	12.32	2.97
i-Pentane	3.92	1.17
n-Pentane	6.06	1.82
Cyclopentane	0.00	0.00
n-Hexane	8.73	3.12
Cyclohexane	0.00	0.00
n-Heptane	2.84	1.18
Methylcyclohexane	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00
Benzene	9.75	3.16
Toluene	3.93	1.50
Ethylbenzene	0.05	0.02
o-Xylene	0.11	0.05
m-Xylene	0.33	0.15
p-Xylene	0.03	0.01
Triethylene Glycol	0.00	0.00
Ethylene Glycol	0.00	0.00
Water	11.99	0.90
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	22.04

BTEX CONDENSER RECOVERED OIL STREAM

Temperature:	120.00	deg F
Pressure:	14.10	psia
Flow Rate:	0.02	sgpm

Component	Conc. (mol%)	Mass Flow (lb/h)
Carbon Dioxide	0.05	0.00
Hydrogen Sulfide	0.00	0.00
Nitrogen	0.00	0.00
Methane	0.02	0.00
Ethane	0.18	0.00
Propane	0.75	0.03
i-Butane	0.28	0.01
n-Butane	2.05	0.10
i-Pentane	1.63	0.10
n-Pentane	3.27	0.20
Cyclopentane	0.00	0.00
n-Hexane	13.36	0.98
Cyclohexane	0.00	0.00
n-Heptane	12.56	1.07
Methylcyclohexane	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00
Benzene	24.47	1.63
Toluene	29.43	2.31
Ethylbenzene	1.23	0.11
o-Xylene	2.34	0.21
m-Xylene	7.44	0.67
p-Xylene	0.59	0.05
Triethylene Glycol	0.00	0.00
Ethylene Glycol	0.00	0.00
Water	0.33	0.01
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	7.51

BTEX CONDENSER PRODUCED WATER STREAM

Temperature:	120.00	deg F
Pressure:	14.10	psia
Flow Rate:	0.13	sgpm

Component	Conc. (mol%)	Mass Flow (lb/h)
Carbon Dioxide	0.00	0.00
Hydrogen Sulfide	0.00	0.00
Nitrogen	0.00	0.00
Methane	0.00	0.00
Ethane	0.00	0.00
Propane	0.00	0.00
i-Butane	0.00	0.00
n-Butane	0.00	0.00
i-Pentane	0.00	0.00
n-Pentane	0.00	0.00
Cyclopentane	0.00	0.00
n-Hexane	0.00	0.00
Cyclohexane	0.00	0.00
n-Heptane	0.00	0.00
Methylcyclohexane	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00
Benzene	0.01	0.04
Toluene	0.00	0.01
Ethylbenzene	0.00	0.00
o-Xylene	0.00	0.00
m-Xylene	0.00	0.00
p-Xylene	0.00	0.00
Triethylene Glycol	0.00	0.02
Ethylene Glycol	0.00	0.00
Water	99.98	67.03
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	67.11

ProMax Dehydration Emissions Report

Case Name: 100 MMSCFD

File Name: C:\Users\Admin\Resolute Compliance, LLC\Environmental Compliance - General\Env\Projects\Env-EnLink-0254\5.0 Air Permit-Horned Frog CS NSR\5.2 Modeling\5.2.2 BRE ProMax-Other Simulation\ProMax_Dehydration_Tool.pmx

Date:

Description:

Dry Gas Flow Rate	98.90	MMSCFD
Dry Gas Water Content	4.55	lb/MMSCF
Glycol Circulation Rate	7.00	sgpm
Glycol Circulation Ratio	1.47	gal/lb
Annual Operating Hours	8760	hrs

INPUT SUMMARY:

Feed Stream Specifications	
Fraction of Water Saturaton (%)	100.00
Water Content (lbm/MMSCF)	69.22
Temperature (°F)	110.00
Pressure (psig)	1100.00
Flow Rate (MMSCFD)	100.00

Lean Glycol Specifications	
Glycol Circulation Rate (sgpm)	7.00

Regenerator Specifications	
Reboiler Temperature (°F)	400.000
Overhead Vapors	To Control Device
Is Reflux Coil Present?	Yes

Flash Tank Specifications	
Is Flash Tank Present?	Flash Tank Present
Temperature (°F)	160.00
Pressure (psig)	45.00
Flash Gas	Vent To Atmosphere

Stripping Gas Specifications	
Nitrogen (scfm)	Not In Use
Dry gas (scfm)	Not In Use

Kimray Pump Specifications	
Type	Gas Injection
Gas Injection Volume Ratio (acfm/gpm)	0.001

Methanol Specifications	
Is Methanol Present?	Not Present in Feed
MeOH Feed Mass Fraction (ppm)	0.00

BTEX Condenser Specifications	
Temperature (°F)	120.00
Pressure (psig)	-0.30
BTEX Emissions	To Flare

General Specifications	
Atmospheric Pressure (psia)	14.400
Flash Gas Flare Destruction Efficiency (%)	95.000
Regenerator Flare Destruction Efficiency (%)	98.000

Feed Composition Data (mol %)	
Carbon Dioxide	0.9115
Hydrogen Sulfide	0.0000
Nitrogen	1.6267
Methane	70.5837
Ethane	13.3096
Propane	7.6136
i-Butane	1.0396
n-Butane	2.6978
i-Pentane	0.6018
n-Pentane	0.7088
Cyclopentane	0.0000
n-Hexane	0.6632
Cyclohexane	0.0000
n-Heptane	0.2041
Methylcyclohexane	0.0000
2,2,4-Trimethylpentane	0.0000
Benzene	0.0236
Toluene	0.0123
Ethylbenzene	0.0004
o-Xylene	0.0006
m-Xylene	0.0024
p-Xylene	0.0002
Triethylene Glycol	0.0000
Ethylene Glycol	0.0000
Water	0.0000
Methanol	0.0000
O2	0.0000
SO2	0.0000
Total	100.00

EMISSIONS REPORTS:

CONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Carbon Dioxide	60.16	1443.95	263.52
Hydrogen Sulfide	0.00	0.00	0.00
Nitrogen	597.88	14349.16	2618.72
Methane	0.01	0.27	0.05
Ethane	0.03	0.64	0.12
Propane	0.05	1.25	0.23
i-Butane	0.01	0.28	0.05
n-Butane	0.06	1.37	0.25
i-Pentane	0.02	0.52	0.09
n-Pentane	0.03	0.77	0.14
Cyclopentane	0.00	0.00	0.00
n-Hexane	0.05	1.31	0.24
Cyclohexane	0.00	0.00	0.00
n-Heptane	0.02	0.50	0.09
Methylcyclohexane	0.00	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00	0.00
Benzene	0.06	1.53	0.28
Toluene	0.03	0.75	0.14
Ethylbenzene	0.00	0.01	0.00
o-Xylene	0.00	0.03	0.00
m-Xylene	0.00	0.08	0.01
p-Xylene	0.00	0.01	0.00
Triethylene Glycol	0.00	0.00	0.00
Ethylene Glycol	0.00	0.00	0.00
Water	26.74	641.87	117.14
Methanol	0.00	0.00	0.00
O2	115.65	2775.55	506.54
SO2	0.00	0.00	0.00
Total Emissions	800.83	19219.85	3507.62
Total HC Emissions	0.39	9.31	1.70
Total VOC Emissions	0.35	8.40	1.53
Total HAP Emissions	0.15	3.72	0.68
Total GHG Emissions	60.18	1444.21	263.57

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Carbon Dioxide	1.13	27.22	4.97
Hydrogen Sulfide	0.00	0.00	0.00
Nitrogen	0.00	0.06	0.01
Methane	0.56	13.41	2.45
Ethane	1.34	32.17	5.87
Propane	2.62	62.92	11.48
i-Butane	0.60	14.35	2.62
n-Butane	2.93	70.39	12.85
i-Pentane	1.16	27.90	5.09
n-Pentane	1.75	42.04	7.67
Cyclopentane	0.00	0.00	0.00
n-Hexane	3.44	82.66	15.09
Cyclohexane	0.00	0.00	0.00
n-Heptane	1.84	44.19	8.06
Methylcyclohexane	0.00	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00	0.00
Benzene	4.80	115.26	21.04
Toluene	3.76	90.17	16.46
Ethylbenzene	0.13	3.24	0.59
o-Xylene	0.27	6.48	1.18
m-Xylene	0.81	19.32	3.53
p-Xylene	0.06	1.53	0.28
Triethylene Glycol	0.04	0.92	0.17
Ethylene Glycol	0.00	0.00	0.00
Water	266.59	6398.22	1167.68
Methanol	0.00	0.00	0.00
O2	0.00	0.00	0.00
SO2	0.00	0.00	0.00
Total Emissions	293.85	7052.47	1287.08
Total HC Emissions	26.12	626.96	114.42
Total VOC Emissions	24.22	581.38	106.10
Total HAP Emissions	13.28	318.67	58.16
Total GHG Emissions	1.69	40.64	7.42

CONTROLLED FLASH TANK EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Carbon Dioxide	0.00	0.00	0.00
Hydrogen Sulfide	0.00	0.00	0.00
Nitrogen	0.00	0.00	0.00
Methane	0.00	0.00	0.00
Ethane	0.00	0.00	0.00
Propane	0.00	0.00	0.00
i-Butane	0.00	0.00	0.00
n-Butane	0.00	0.00	0.00
i-Pentane	0.00	0.00	0.00
n-Pentane	0.00	0.00	0.00
Cyclopentane	0.00	0.00	0.00
n-Hexane	0.00	0.00	0.00
Cyclohexane	0.00	0.00	0.00
n-Heptane	0.00	0.00	0.00
Methylcyclohexane	0.00	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00	0.00
Benzene	0.00	0.00	0.00
Toluene	0.00	0.00	0.00
Ethylbenzene	0.00	0.00	0.00
o-Xylene	0.00	0.00	0.00
m-Xylene	0.00	0.00	0.00
p-Xylene	0.00	0.00	0.00
Triethylene Glycol	0.00	0.00	0.00
Ethylene Glycol	0.00	0.00	0.00
Water	0.00	0.00	0.00
Methanol	0.00	0.00	0.00
O2	0.00	0.00	0.00
SO2	0.00	0.00	0.00
Total Emissions	0.00	0.00	0.00
Total HC Emissions	0.00	0.00	0.00
Total VOC Emissions	0.00	0.00	0.00
Total HAP Emissions	0.00	0.00	0.00
Total GHG Emissions	0.00	0.00	0.00

UNCONTROLLED FLASH TANK OFF GAS

Component	lbs/hr	lbs/day	tons/yr
Carbon Dioxide	3.74	89.86	16.40
Hydrogen Sulfide	0.00	0.00	0.00
Nitrogen	0.24	5.66	1.03
Methane	15.41	369.89	67.50
Ethane	11.66	279.85	51.07
Propane	12.52	300.43	54.83
i-Butane	2.18	52.25	9.54
n-Butane	7.28	174.65	31.87
i-Pentane	1.91	45.81	8.36
n-Pentane	2.48	59.40	10.84
Cyclopentane	0.00	0.00	0.00
n-Hexane	2.47	59.22	10.81
Cyclohexane	0.00	0.00	0.00
n-Heptane	0.84	20.19	3.69
Methylcyclohexane	0.00	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00	0.00
Benzene	0.27	6.37	1.16
Toluene	0.12	2.81	0.51
Ethylbenzene	0.00	0.06	0.01
o-Xylene	0.00	0.09	0.02
m-Xylene	0.02	0.37	0.07
p-Xylene	0.00	0.03	0.01
Triethylene Glycol	0.00	0.06	0.01
Ethylene Glycol	0.00	0.00	0.00
Water	0.95	22.80	4.16
Methanol	0.00	0.00	0.00
O2	0.00	0.00	0.00
SO2	0.00	0.00	0.00
Total Emissions	62.07	1489.80	271.89
Total HC Emissions	57.15	1371.49	250.30
Total VOC Emissions	30.07	721.75	131.72
Total HAP Emissions	2.87	68.94	12.58
Total GHG Emissions	19.16	459.75	83.90

COMBINED REGENERATOR VENT/FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Carbon Dioxide	63.91	1533.80	279.92
Hydrogen Sulfide	0.00	0.00	0.00
Nitrogen	598.12	14354.82	2619.76
Methane	15.42	370.15	67.55
Ethane	11.69	280.49	51.19
Propane	12.57	301.68	55.06
i-Butane	2.19	52.53	9.59
n-Butane	7.33	176.02	32.12
i-Pentane	1.93	46.33	8.45
n-Pentane	2.51	60.17	10.98
Cyclopentane	0.00	0.00	0.00
n-Hexane	2.52	60.52	11.05
Cyclohexane	0.00	0.00	0.00
n-Heptane	0.86	20.70	3.78
Methylcyclohexane	0.00	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00	0.00
Benzene	0.33	7.90	1.44
Toluene	0.15	3.56	0.65
Ethylbenzene	0.00	0.08	0.01
o-Xylene	0.00	0.12	0.02
m-Xylene	0.02	0.44	0.08
p-Xylene	0.00	0.04	0.01
Triethylene Glycol	0.00	0.06	0.01
Ethylene Glycol	0.00	0.00	0.00
Water	27.69	664.67	121.30
Methanol	0.00	0.00	0.00
O2	115.65	2775.55	506.54
SO2	0.00	0.00	0.00
Total Emissions	862.90	20709.65	3779.51
Total HC Emissions	57.53	1380.80	252.00
Total VOC Emissions	30.42	730.15	133.25
Total HAP Emissions	3.03	72.66	13.26
Total GHG Emissions	79.33	1903.96	347.47

EQUIPMENT REPORTS:

BTEX CONDENSER

Condenser Outlet Temperature:	120.00	deg. F
Condenser Pressure:	14.10	psia
Condenser Duty:	-0.29	MMBTU/hr
Hydrocarbon Recovery:	0.55	bbls/day
Produced Water:	18.23	bbls/day
VOC Control Efficiency:	27.64	%
HAP Control Efficiency:	41.70	%
BTEX Control Efficiency:	48.97	%
Dissolved Hydrocarbons in Water:	877.02	mg/L

Component	Emitted (wt. %)	Condensed (wt. %)
Carbon Dioxide	98.74	1.26
Hydrogen Sulfide	0.00	0.00
Nitrogen	99.95	0.05
Methane	99.88	0.12
Ethane	99.61	0.39
Propane	99.05	0.95
i-Butane	98.15	1.85
n-Butane	97.16	2.84
i-Pentane	93.21	6.79
n-Pentane	91.37	8.63
Cyclopentane	0.00	0.00
n-Hexane	79.05	20.95
Cyclohexane	0.00	0.00
n-Heptane	56.68	43.32
Methylcyclohexane	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00
Benzene	66.49	33.51
Toluene	41.84	58.16
Ethylbenzene	19.51	80.49
o-Xylene	20.00	80.00
m-Xylene	19.76	80.24
p-Xylene	20.13	79.87
Triethylene Glycol	0.00	100.00
Ethylene Glycol	0.00	0.00
Water	0.33	99.67
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00

ABSORBER

Absorber Stages:	3.00	
Dry Gas Dew Point:	4.55	lb H2O/MMSCF
Temperature:	120.00	deg. F
Pressure:	1119.40	psia
Dry Gas Flow Rate:	98.90	MMSCFD
TEG Losses with Dry Gas:	2.35	lb/hr
Wet Gas Water Content:	69.22	lb H2O/MMSCF
Lean Glycol Recirc. Ratio:	1.47	gal/lb H2O

Component	In Dry Gas (%)	Absorbed in Glycol (%)
Carbon Dioxide	99.89	0.11
Hydrogen Sulfide	-	-
Nitrogen	100.00	0.00
Methane	99.99	0.01
Ethane	99.97	0.03
Propane	99.96	0.04
i-Butane	99.96	0.04
n-Butane	99.94	0.06
i-Pentane	99.93	0.07
n-Pentane	99.92	0.08
Cyclopentane	-	-
n-Hexane	99.89	0.11
Cyclohexane	-	-
n-Heptane	99.85	0.15
Methylcyclohexane	-	-
2,2,4-Trimethylpentane	-	-
Benzene	97.10	2.90
Toluene	95.92	4.08
Ethylbenzene	95.33	4.67
o-Xylene	93.46	6.54
m-Xylene	95.23	4.77
p-Xylene	95.48	4.52
Triethylene Glycol	0.06	99.94
Ethylene Glycol	-	-
Water	5.84	94.16
Methanol	-	-
O2	-	-
SO2	-	-

FLASH TANK

	Flash Temperature:	160 deg. F
	Flash Pressure:	45 psig

Component	Flashed (wt. %)	Left in Glycol (wt. %)
Carbon Dioxide	76.75	23.25
Hydrogen Sulfide	0.00	0.00
Nitrogen	98.99	1.01
Methane	96.50	3.50
Ethane	89.69	10.31
Propane	82.68	17.32
i-Butane	78.45	21.55
n-Butane	71.27	28.73
i-Pentane	62.15	37.85
n-Pentane	58.56	41.44
Cyclopentane	0.00	0.00
n-Hexane	41.74	58.26
Cyclohexane	0.00	0.00
n-Heptane	31.37	68.63
Methylcyclohexane	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00
Benzene	5.24	94.76
Toluene	3.02	96.98
Ethylbenzene	1.89	98.11
o-Xylene	1.37	98.63
m-Xylene	1.85	98.15
p-Xylene	1.95	98.05
Triethylene Glycol	0.00	100.00
Ethylene Glycol	0.00	0.00
Water	0.31	99.69
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00

REGENERATOR

Component	Recovered in Glycol (%)	Distilled Overhead (%)
Carbon Dioxide	0.00	100.00
Hydrogen Sulfide	-	-
Nitrogen	0.00	100.00
Methane	0.00	100.00
Ethane	0.00	100.00
Propane	0.00	100.00
i-Butane	0.00	100.00
n-Butane	0.00	100.00
i-Pentane	0.00	100.00
n-Pentane	0.00	100.00
Cyclopentane	-	-
n-Hexane	0.00	100.00
Cyclohexane	-	-
n-Heptane	0.00	100.00
Methylcyclohexane	-	-
2,2,4-Trimethylpentane	-	-
Benzene	0.02	99.98
Toluene	0.12	99.88
Ethylbenzene	0.49	99.51
o-Xylene	1.14	98.86
m-Xylene	0.52	99.48
p-Xylene	0.46	99.54
Triethylene Glycol	100.00	0.00
Ethylene Glycol	-	-
Water	11.42	88.58
Methanol	-	-
O2	-	-
SO2	-	-

STREAM REPORTS:

WET GAS STREAM

Temperature:	110.00	deg F
Pressure:	1114.40	psia
Flow Rate:	99.05	MMSCFD

Component	Conc. (mol%)	Mass Flow (lb/h)
Carbon Dioxide	0.91	4370.58
Hydrogen Sulfide	0.00	0.00
Nitrogen	1.64	4986.74
Methane	70.89	123683.64
Ethane	13.28	43422.17
Propane	7.52	36062.42
i-Butane	1.01	6405.62
n-Butane	2.61	16481.80
i-Pentane	0.57	4459.24
n-Pentane	0.66	5194.78
Cyclopentane	0.00	0.00
n-Hexane	0.58	5390.57
Cyclohexane	0.00	0.00
n-Heptane	0.16	1737.85
Methylcyclohexane	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00
Benzene	0.02	174.87
Toluene	0.01	95.08
Ethylbenzene	0.00	2.96
o-Xylene	0.00	4.23
m-Xylene	0.00	17.28
p-Xylene	0.00	1.45
Triethylene Glycol	0.00	0.00
Ethylene Glycol	0.00	0.00
Water	0.15	286.28
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	252777.52

DRY GAS STREAM

Temperature:	111.46	deg F
Pressure:	1109.40	psia
Flow Rate:	98.90	MMSCFD

Component	Conc. (mol%)	Mass Flow (lb/h)
Carbon Dioxide	0.91	4365.75
Hydrogen Sulfide	0.00	0.00
Nitrogen	1.64	4986.55
Methane	70.99	123669.05
Ethane	13.29	43409.65
Propane	7.53	36047.68
i-Butane	1.01	6402.91
n-Butane	2.61	16471.77
i-Pentane	0.57	4456.22
n-Pentane	0.66	5190.61
Cyclopentane	0.00	0.00
n-Hexane	0.58	5384.72
Cyclohexane	0.00	0.00
n-Heptane	0.16	1735.19
Methylcyclohexane	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00
Benzene	0.02	169.81
Toluene	0.01	91.20
Ethylbenzene	0.00	2.82
o-Xylene	0.00	3.96
m-Xylene	0.00	16.46
p-Xylene	0.00	1.38
Triethylene Glycol	0.00	2.35
Ethylene Glycol	0.00	0.00
Water	0.01	18.74
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	252426.81

LEAN GLYCOL STREAM

Temperature:	120.00	deg F
Pressure:	1119.40	psia
Flow Rate:	7.00	sgpm

Component	Conc. (wt%)	Mass Flow (lb/h)
Carbon Dioxide	0.00	0.00
Hydrogen Sulfide	0.00	0.00
Nitrogen	0.00	0.00
Methane	0.00	0.00
Ethane	0.00	0.00
Propane	0.00	0.00
i-Butane	0.00	0.00
n-Butane	0.00	0.00
i-Pentane	0.00	0.00
n-Pentane	0.00	0.00
Cyclopentane	0.00	0.00
n-Hexane	0.00	0.00
Cyclohexane	0.00	0.00
n-Heptane	0.00	0.00
Methylcyclohexane	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00
Benzene	0.00	0.00
Toluene	0.00	0.00
Ethylbenzene	0.00	0.00
o-Xylene	0.00	0.00
m-Xylene	0.00	0.00
p-Xylene	0.00	0.00
Triethylene Glycol	99.13	3916.56
Ethylene Glycol	0.00	0.00
Water	0.87	34.38
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	3950.96

RICH GLYCOL STREAM

Temperature:	111.25	deg F
Pressure:	1114.40	psia
Flow Rate:	7.90	sgpm

Component	Conc. (wt%)	Mass Flow (lb/h)
Carbon Dioxide	0.11	4.88
Hydrogen Sulfide	0.00	0.00
Nitrogen	0.01	0.24
Methane	0.37	15.97
Ethane	0.30	13.00
Propane	0.35	15.14
i-Butane	0.06	2.78
n-Butane	0.24	10.21
i-Pentane	0.07	3.07
n-Pentane	0.10	4.23
Cyclopentane	0.00	0.00
n-Hexane	0.14	5.91
Cyclohexane	0.00	0.00
n-Heptane	0.06	2.68
Methylcyclohexane	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00
Benzene	0.12	5.07
Toluene	0.09	3.88
Ethylbenzene	0.00	0.14
o-Xylene	0.01	0.28
m-Xylene	0.02	0.82
p-Xylene	0.00	0.07
Triethylene Glycol	90.93	3914.22
Ethylene Glycol	0.00	0.00
Water	7.01	301.92
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	4304.49

FLASH TANK OFF GAS STREAM

Temperature:	160.00	deg F
Pressure:	59.40	psia
Flow Rate:	775.64	scfh

Component	Conc. (mol%)	Mass Flow (lb/h)
Carbon Dioxide	4.16	3.74
Hydrogen Sulfide	0.00	0.00
Nitrogen	0.41	0.24
Methane	47.00	15.41
Ethane	18.97	11.66
Propane	13.89	12.52
i-Butane	1.83	2.18
n-Butane	6.13	7.28
i-Pentane	1.29	1.91
n-Pentane	1.68	2.48
Cyclopentane	0.00	0.00
n-Hexane	1.40	2.47
Cyclohexane	0.00	0.00
n-Heptane	0.41	0.84
Methylcyclohexane	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00
Benzene	0.17	0.27
Toluene	0.06	0.12
Ethylbenzene	0.00	0.00
o-Xylene	0.00	0.00
m-Xylene	0.01	0.02
p-Xylene	0.00	0.00
Triethylene Glycol	0.00	0.00
Ethylene Glycol	0.00	0.00
Water	2.58	0.95
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	62.07

FLASH TANK GLYCOL STREAM

Temperature:	160.00	deg F
Pressure:	59.40	psia
Flow Rate:	7.61	sgpm

Component	Conc. (wt%)	Mass Flow (lb/h)
Carbon Dioxide	0.03	1.13
Hydrogen Sulfide	0.00	0.00
Nitrogen	0.00	0.00
Methane	0.01	0.56
Ethane	0.03	1.34
Propane	0.06	2.62
i-Butane	0.01	0.60
n-Butane	0.07	2.93
i-Pentane	0.03	1.16
n-Pentane	0.04	1.75
Cyclopentane	0.00	0.00
n-Hexane	0.08	3.44
Cyclohexane	0.00	0.00
n-Heptane	0.04	1.84
Methylcyclohexane	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00
Benzene	0.11	4.80
Toluene	0.09	3.76
Ethylbenzene	0.00	0.14
o-Xylene	0.01	0.27
m-Xylene	0.02	0.81
p-Xylene	0.00	0.06
Triethylene Glycol	92.26	3914.21
Ethylene Glycol	0.00	0.00
Water	7.09	300.97
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	4242.42

REGENERATOR OVERHEADS STREAM

Temperature:	209.36	deg F
Pressure:	14.10	psia
Flow Rate:	5782.15	scfh

Component	Conc. (mol%)	Mass Flow (lb/h)
Carbon Dioxide	0.17	1.13
Hydrogen Sulfide	0.00	0.00
Nitrogen	0.00	0.00
Methane	0.23	0.56
Ethane	0.29	1.34
Propane	0.39	2.62
i-Butane	0.07	0.60
n-Butane	0.33	2.93
i-Pentane	0.11	1.16
n-Pentane	0.16	1.75
Cyclopentane	0.00	0.00
n-Hexane	0.26	3.44
Cyclohexane	0.00	0.00
n-Heptane	0.12	1.84
Methylcyclohexane	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00
Benzene	0.40	4.80
Toluene	0.27	3.76
Ethylbenzene	0.01	0.13
o-Xylene	0.02	0.27
m-Xylene	0.05	0.81
p-Xylene	0.00	0.06
Triethylene Glycol	0.00	0.04
Ethylene Glycol	0.00	0.00
Water	97.12	266.59
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	293.85

BTEX CONDENSER VENT GAS STREAM

Temperature:	120.00	deg F
Pressure:	14.10	psia
Flow Rate:	156.22	scfh

Component	Conc. (mol%)	Mass Flow (lb/h)
Carbon Dioxide	6.18	1.12
Hydrogen Sulfide	0.00	0.00
Nitrogen	0.02	0.00
Methane	8.45	0.56
Ethane	10.79	1.34
Propane	14.31	2.60
i-Butane	2.45	0.59
n-Butane	11.91	2.85
i-Pentane	3.65	1.08
n-Pentane	5.39	1.60
Cyclopentane	0.00	0.00
n-Hexane	7.68	2.72
Cyclohexane	0.00	0.00
n-Heptane	2.53	1.04
Methylcyclohexane	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00
Benzene	9.93	3.19
Toluene	4.14	1.57
Ethylbenzene	0.06	0.03
o-Xylene	0.12	0.05
m-Xylene	0.36	0.16
p-Xylene	0.03	0.01
Triethylene Glycol	0.00	0.00
Ethylene Glycol	0.00	0.00
Water	11.99	0.89
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	21.41

BTEX CONDENSER RECOVERED OIL STREAM

Temperature:	120.00	deg F
Pressure:	14.10	psia
Flow Rate:	0.02	sgpm

Component	Conc. (mol%)	Mass Flow (lb/h)
Carbon Dioxide	0.06	0.00
Hydrogen Sulfide	0.00	0.00
Nitrogen	0.00	0.00
Methane	0.03	0.00
Ethane	0.19	0.00
Propane	0.73	0.02
i-Butane	0.26	0.01
n-Butane	1.92	0.08
i-Pentane	1.49	0.08
n-Pentane	2.85	0.15
Cyclopentane	0.00	0.00
n-Hexane	11.42	0.72
Cyclohexane	0.00	0.00
n-Heptane	10.86	0.80
Methylcyclohexane	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00
Benzene	25.33	1.45
Toluene	31.47	2.12
Ethylbenzene	1.39	0.11
o-Xylene	2.74	0.21
m-Xylene	8.26	0.64
p-Xylene	0.65	0.05
Triethylene Glycol	0.00	0.00
Ethylene Glycol	0.00	0.00
Water	0.36	0.00
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	6.46

BTEX CONDENSER PRODUCED WATER STREAM

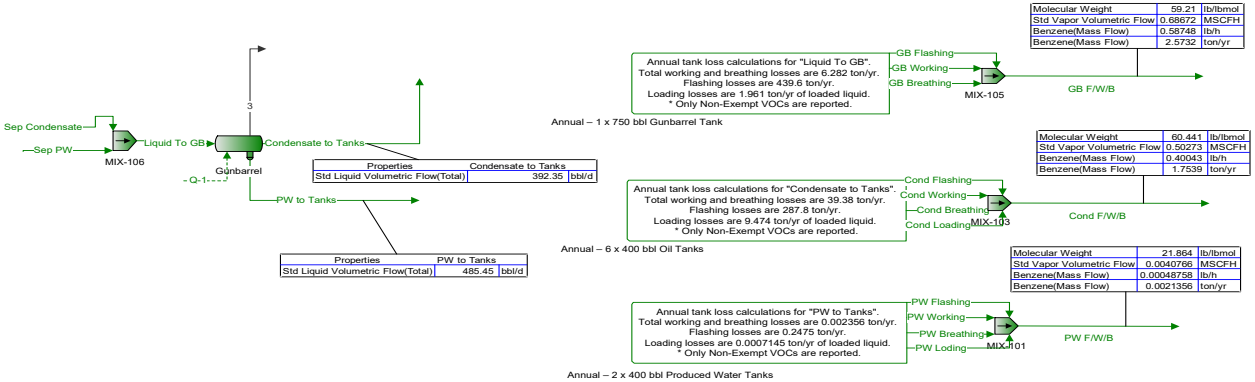
Temperature:	120.00	deg F
Pressure:	14.10	psia
Flow Rate:	0.53	sgpm

Component	Conc. (mol%)	Mass Flow (lb/h)
Carbon Dioxide	0.00	0.01
Hydrogen Sulfide	0.00	0.00
Nitrogen	0.00	0.00
Methane	0.00	0.00
Ethane	0.00	0.00
Propane	0.00	0.00
i-Butane	0.00	0.00
n-Butane	0.00	0.00
i-Pentane	0.00	0.00
n-Pentane	0.00	0.00
Cyclopentane	0.00	0.00
n-Hexane	0.00	0.00
Cyclohexane	0.00	0.00
n-Heptane	0.00	0.00
Methylcyclohexane	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00
Benzene	0.01	0.16
Toluene	0.00	0.06
Ethylbenzene	0.00	0.00
o-Xylene	0.00	0.00
m-Xylene	0.00	0.00
p-Xylene	0.00	0.00
Triethylene Glycol	0.00	0.04
Ethylene Glycol	0.00	0.00
Water	99.98	265.70
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	265.98

Horned Frog CS Tanks

Oil TP: 143,208 bbl/y
Water TP: 177,190 bbl/y

Sample: Horned Frog Condensate



Process Streams		Cond Breathing	Cond F/W/B/L	Cond W&B	Cond Flashing
Composition	**Status:**	Solved	Solved		Solved
Phase: **Total**	**From Block:**	--	MIX-103		--
	To Block:	MIX-103	--		MIX-103
Mole Fraction		%	%		%
Nitrogen		0*	0		0*
Methane		1.30505*	3.14789		3.47346*
CO2		0*	0		0*
Ethane		8.83674*	5.85311		5.32600*
Propane		21.1921*	17.5163		16.8669*
i-Butane		7.18419*	6.84215		6.78173*
n-Butane		27.0251*	26.0127		25.8339*
i-Pentane		10.0455*	10.9259		11.0814*
n-Pentane		12.6324*	14.1278		14.3920*
i-Hexane		3.57422*	4.16491		4.26927*
Hexane		5.76676*	6.93132		7.13706*
2,2,4-Trimethylpentane		0*	0		0*
Benzene		0.203795*	0.386960		0.419319*
Heptane		1.82027*	2.45100		2.56242*
Toluene		0.118224*	0.232577		0.252779*
Octane		0.240509*	0.387591		0.413576*
Ethylbenzene		0.00320745*	0.00658563		0.00718244*
m-Xylene		0.0160213*	0.0338258		0.0369713*
o-Xylene		0.00123210*	0.00292967		0.00322958*
p-Xylene		0.00434218*	0.00886483		0.00966383*
Nonane		0.0219796*	0.0443889		0.0483479*
Decane		0.00774732*	0.0193553		0.0214061*
Water		0.000561020*	0.903644		1.06319*
Undecane		7.18496E-05*	0.000165817		0.000182418*
Molar Flow		lbmol/h	lbmol/h		lbmol/h
Nitrogen		0*	0		0*
Methane		0.000524631*	0.0417028		0.0391070*
CO2		0*	0		0*
Ethane		0.00355238*	0.0775411		0.0599644*
Propane		0.00851926*	0.232053		0.189900*
i-Butane		0.00288805*	0.0906438		0.0763541*
n-Butane		0.0108641*	0.344613		0.290858*
i-Pentane		0.00403829*	0.144745		0.124764*
n-Pentane		0.00507823*	0.187163		0.162037*
i-Hexane		0.00143684*	0.0551761		0.0480668*
Hexane		0.00231825*	0.0918251		0.0803547*
2,2,4-Trimethylpentane		0*	0		0*
Benzene		8.19259E-05*	0.00512638		0.00472102*
Heptane		0.000731752*	0.0324704		0.0288498*
Toluene		4.75262E-05*	0.00308114		0.00284598*
Octane		9.66850E-05*	0.00513475		0.00465636*
Ethylbenzene		1.28940E-06*	8.72454E-05		8.08656E-05*
m-Xylene		6.44057E-06*	0.000448119		0.000416252*
o-Xylene		4.95305E-07*	3.88119E-05		3.63612E-05*
p-Xylene		1.74556E-06*	0.000117440		0.000108803*
Nonane		8.83583E-06*	0.000588057		0.000544339*
Decane		3.11443E-06*	0.000256416		0.000241006*
Water		2.25531E-07*	0.0119713		0.0119702*
Undecane		2.88836E-08*	2.19672E-06		2.05381E-06*

Mass Fraction	%	%		%
Nitrogen	0	0		0
Methane	0.355221	0.835521		0.917903
CO2	0	0		0
Ethane	4.50830	2.91188		2.63806
Propane	15.8552	12.7792		12.2516
i-Butane	7.08469	6.57963		6.49300
n-Butane	26.6509	25.0147		24.7340
i-Pentane	12.2970	13.0423		13.1701
n-Pentane	15.4638	16.8644		17.1047
i-Hexane	5.22596	5.93821		6.06038
Hexane	8.43173	9.88248		10.1313
2,2,4-Trimethylpentane	0	0		0
Benzene	0.270092	0.500091		0.539541
Heptane	3.09467	4.06336		4.22951
Toluene	0.184819	0.354547		0.383658
Octane	0.466130	0.732513		0.778203
Ethylbenzene	0.00577753	0.0115677		0.0125608
m-Xylene	0.0288589	0.0594150		0.0646560
o-Xylene	0.00221936	0.00514597		0.00564795
p-Xylene	0.00782151	0.0155711		0.0169003
Nonane	0.0478295	0.0941923		0.102145
Decane	0.0187026	0.0455634		0.0501706
Water	0.000171483	0.269343		0.315511
Undecane	0.000190549	0.000428823		0.000469692
Mass Flow	**lb/h**	**lb/h**		**lb/h**
Nitrogen	0*	0	0*	0*
Methane	0.00841638*	0.669015	0.033567231*	0.627372*
CO2	0*	0	0*	0*
Ethane	0.106817*	2.33159	0.426019635*	1.80307*
Propane	0.375662*	10.2325	1.498261984*	8.37378*
i-Butane	0.167860*	5.26842	0.669480076*	4.43787*
n-Butane	0.631448*	20.0297	2.518418397*	16.9053*
i-Pentane	0.291358*	10.4432	1.162028945*	9.00155*
n-Pentane	0.366388*	13.5036	1.461273997*	11.6908*
i-Hexane	0.123820*	4.75482	0.49383581*	4.14217*
Hexane	0.199776*	7.91306	0.796770351*	6.92459*
2,2,4-Trimethylpentane	0*	0	0*	0*
Benzene	0.00639938*	0.400431	0.025522804*	0.368768*
Heptane	0.0733230*	3.25360	0.292435832*	2.89080*
Toluene	0.00437899*	0.283891	0.017464831*	0.262225*
Octane	0.0110442*	0.586535	0.044047788*	0.531889*
Ethylbenzene	0.000136889*	0.00926241	0.000545958*	0.00858510*
m-Xylene	0.000683764*	0.0475745	0.00272707*	0.0441914*
o-Xylene	5.25840E-05*	0.00412046	0.000209722*	0.00386028*
p-Xylene	0.000185318*	0.0124680	0.000739107*	0.0115511*
Nonane	0.00113324*	0.0754213	0.004519726*	0.0698142*
Decane	0.000443127*	0.0364833	0.001767333*	0.0342908*
Water	4.06301E-06*	0.215667	1.62046E-05*	0.215647*
Undecane	4.51475E-06*	0.000343366	1.80063E-05*	0.000321027*

Process Streams		Cond Breathing	Cond F/W/B	Cond Flashing
Properties	**Status:**	Solved	Solved	Solved
Phase: **Total**	**From Block:**	--	MIX-103	--
	To Block:	MIX-103	--	MIX-103
Property	**Units**			
Temperature	°F	76.2171	94.1767	97.8
Pressure	psia	10.2648	10.2648	12.8800
Mole Fraction Vapor	%	100	100	100
Mole Fraction Light Liquid	%	0	0	0
Mole Fraction Heavy Liquid	%	0	0	0
Phase Mole Fraction	%	100	100	100
Molecular Weight	lb/lbmol	58.9384	60.4412	60.7067
Mass Density	lb/ft^3	0.107322	0.106394	0.133852
Molar Flow	lbmol/h	0.0402001	1.32478	1.12588
Mass Flow	lb/h	2.36933	80.0716	68.3484
Vapor Volumetric Flow	ft^3/h	22.0769	752.597	510.629
Liquid Volumetric Flow	gpm	2.75245	93.8303	63.6628
Std Vapor Volumetric Flow	MMSCFD	0.000366128	0.0120656	0.0102541
Std Liquid Volumetric Flow	sgpm	0.00823923	0.273165	0.232398
Compressibility		0.980218	0.981100	0.976437
Specific Gravity		2.03499	2.08688	2.09605
API Gravity				
Enthalpy	Btu/h	-2213.07	-74258.4	-63308.4
Mass Enthalpy	Btu/lb	-934.048	-927.400	-926.259
Mass Cp	Btu/(lb*°F)	0.401645	0.411625	0.414336
Ideal Gas CpCv Ratio		1.09225	1.08733	1.08645
Dynamic Viscosity	cP	0.00752591	0.00772069	0.00777066
Kinematic Viscosity	cSt	4.37774	4.53022	3.62421
Thermal Conductivity	Btu/(h*ft*°F)	0.00925929	0.00979809	0.00992005
Surface Tension	lbf/ft			
Net Ideal Gas Heating Value	Btu/ft^3	3048.06	3111.72	3122.97
Net Liquid Heating Value	Btu/lb	19466.4	19376.5	19361.0
Gross Ideal Gas Heating Value	Btu/ft^3	3301.82	3369.81	3381.82
Gross Liquid Heating Value	Btu/lb	21100.7	20997.3	20979.5

Cond Loading	Cond Working	Condensate to Tanks	GB Breathing	GB W&B
Solved	Solved	Solved	Solved	
--	--	Gunbarrel	--	
MIX-103	MIX-103	--	MIX-105	
%	%	%	%	
0*	0*	0	0*	
1.30505*	1.30505*	0.105386	0.701151*	
0*	0*	0	0*	
8.83674*	8.83674*	0.267270	5.14917*	
21.1921*	21.1921*	1.71611	13.8514*	
7.18419*	7.18419*	1.40887	5.02721*	
27.0251*	27.0251*	7.53464	19.2960*	
10.0455*	10.0455*	7.09731	7.37357*	
12.6324*	12.6324*	12.0066	9.32292*	
3.57422*	3.57422*	8.26782	2.66559*	
5.76676*	5.76676*	18.8053	4.30974*	
0*	0*	0	0*	
0.203795*	0.203795*	1.07326	0.153215*	
1.82027*	1.82027*	20.2851	1.36567*	
0.118224*	0.118224*	2.13688	0.0888179*	
0.240509*	0.240509*	9.87761	0.180674*	
0.00320745*	0.00320745*	0.179896	0.00241038*	
0.0160213*	0.0160213*	1.02956	0.0120388*	
0.00123210*	0.00123210*	0.0999358	0.000926071*	
0.00434218*	0.00434218*	0.259880	0.00326287*	
0.0219796*	0.0219796*	3.39918	0.0165184*	
0.00774732*	0.00774732*	4.29896	0.00582336*	
0.000561020*	0.000561020*	0.0404807	30.4738*	
7.18496E-05*	7.18496E-05*	0.109973	5.40027E-05*	
lbmol/h	lbmol/h	lbmol/h	lbmol/h	
0*	0*	0	0*	
0.000503414*	0.00156777*	0.0453213	7.02729E-06*	
0*	0*	0	0*	
0.00340871*	0.0106157*	0.114940	5.16075E-05*	
0.00817472*	0.0254583*	0.738015	0.000138826*	
0.00277125*	0.00863044*	0.605884	5.03852E-05*	
0.0104248*	0.0324656*	3.24028	0.000193394*	
0.00387497*	0.0120677*	3.05220	7.39015E-05*	
0.00487285*	0.0151754*	5.16346	9.34389E-05*	
0.00137873*	0.00429375*	3.55558	2.67158E-05*	
0.00222449*	0.00692767*	8.08724	4.31943E-05*	
0*	0*	0	0*	
7.86125E-05*	0.000244821*	0.461555	1.53560E-06*	
0.000702158*	0.00218671*	8.72360	1.36875E-05*	
4.56041E-05*	0.000142024*	0.918968	8.90177E-07*	
9.27748E-05*	0.000288926*	4.24787	1.81081E-06*	
1.23725E-06*	3.85314E-06*	0.0773642	2.41580E-08*	
6.18010E-06*	1.92465E-05*	0.442761	1.20659E-07*	
4.75273E-07*	1.48013E-06*	0.0429775	9.28154E-09*	
1.67497E-06*	5.21631E-06*	0.111761	3.27022E-08*	
8.47848E-06*	2.64043E-05*	1.46182	1.65556E-07*	
2.98848E-06*	9.30693E-06*	1.84877	5.83646E-08*	
2.16410E-07*	6.73960E-07*	0.0174087	0.000305424*	
2.77155E-08*	8.63137E-08*	0.0472941	5.41241E-10*	

%	%	%	%	
0	0	0	0	
0.355221	0.355221	0.0188051	0.237912	
0	0	0	0	
4.50830	4.50830	0.0893909	3.27484	
15.8552	15.8552	0.841714	12.9188	
7.08469	7.08469	0.910826	6.18020	
26.6509	26.6509	4.87111	23.7216	
12.2970	12.2970	5.69568	11.2523	
15.4638	15.4638	9.63548	14.2270	
5.22596	5.22596	7.92497	4.85859	
8.43173	8.43173	18.0255	7.85539	
0	0	0	0	
0.270092	0.270092	0.932489	0.253135	
3.09467	3.09467	22.6087	2.89439	
0.184819	0.184819	2.19000	0.173091	
0.466130	0.466130	12.5502	0.436520	
0.00577753	0.00577753	0.212434	0.00541252	
0.0288589	0.0288589	1.21578	0.0270332	
0.00221936	0.00221936	0.118012	0.00207950	
0.00782151	0.00782151	0.306886	0.00732682	
0.0478295	0.0478295	4.84922	0.0448101	
0.0187026	0.0187026	6.80355	0.0175249	
0.000171483	0.000171483	0.00811170	11.6119	
0.000190549	0.000190549	0.191202	0.000178538	

lb/h	lb/h	lb/h	lb/h	
0*	0*	0	0*	0*
0.00807599*	0.0251509*	0.727065	0.000112735*	0.004020392*
0*	0*	0	0*	0*
0.102497*	0.319203*	3.45613	0.00155179*	0.055340371*
0.360469*	1.12260*	32.5432	0.00612160*	0.218310615*
0.161071*	0.501620*	35.2153	0.00292850*	0.104437023*
0.605910*	1.88697*	188.332	0.0112405*	0.400862562*
0.279574*	0.870671*	220.213	0.00533191*	0.190148199*
0.351570*	1.09489*	372.537	0.00674151*	0.240417766*
0.118813*	0.370015*	306.404	0.00230225*	0.082103517*
0.191696*	0.596995*	696.920	0.00372229*	0.132745446*
0*	0*	0	0*	0*
0.00614057*	0.0191234*	36.0529	0.000119949*	0.004277644*
0.0703576*	0.219113*	874.122	0.00137151*	0.048911237*
0.00420189*	0.0130858*	84.6722	8.20195E-05*	0.002925007*
0.0105975*	0.0330036*	485.228	0.000206846*	0.007376603*
0.000131353*	0.000409069*	8.21337	2.56473E-06*	9.14643E-05*
0.000656110*	0.00204331*	47.0057	1.28097E-05*	0.000456825*
5.04574E-05*	0.000157138*	4.56270	9.85375E-07*	3.51408E-05*
0.000177823*	0.000553789*	11.8652	3.47182E-06*	0.000123813*
0.00108741*	0.00338649*	187.486	2.12333E-05*	0.00075723*
0.000425205*	0.00132421*	263.046	8.30422E-06*	0.000296148*
3.89868E-06*	1.21416E-05*	0.313623	0.00550229*	0.196224607*
4.33216E-06*	1.34915E-05*	7.39246	8.46005E-08*	3.01705E-06*

Cond Loading	Cond Working	›ndensate to Tan	GB Breathing
Solved	Solved	Solved	Solved
--	--	Gunbarrel	--
MIX-103	MIX-103	--	MIX-105
76.2171	76.2171	70	76.1390
10.2648	10.2648	14.6959	1.46621
100	100	0	100
0	0	100	0
0	0	0	0
100	100	100	100
58.9384	58.9384	89.9035	47.2788
0.107322	0.107322	42.1052	0.0120787
0.0385743	0.120131	43.0051	0.00100225
2.27351	7.08034	3866.31	0.0473851
21.1841	65.9730	91.8250	3.92303
2.64113	8.22520	11.4483	0.489106
0.000351320	0.00109411	0.391674	9.12811E-06
0.00790601	0.0246215	11.4435	0.000155226
0.980218	0.980218	0.00552039	0.998085
2.03499	2.03499	0.675100	1.63241
		76.5330	
-2123.57	-6613.37	-3.64041E+06	-70.5934
-934.048	-934.048	-941.572	-1489.78
0.401645	0.401645	0.519999	0.404272
1.09225	1.09225	1.06095	1.11605
0.00752591	0.00752591	0.341676	0.00834181
4.37774	4.37774	0.506592	43.1141
0.00925929	0.00925929	0.0699816	0.00925756
		0.00128683	
3048.06	3048.06	4565.83	2159.35
19466.4	19466.4	19112.4	17068.4
3301.82	3301.82	4923.09	2354.00
21100.7	21100.7	20620.7	18631.1

GB F/W/B	GB Flashing	GB Working	Liquid To GB	PW Breathing	PW W&B
Solved	Solved	Solved	Solved	Solved	
MIX-105	--	--	MIX-106	--	
--	MIX-105	MIX-105	Gunbarrel	MIX-101	
%	%	%	%	%	
0	0*	0*	0	0*	
2.38195	2.41581*	0.701151*	0.0108444	0.831929*	
0	0*	0*	0	0*	
4.16207	4.14218*	5.14917*	0.0266181	0.387469*	
14.8063	14.8255*	13.8514*	0.169567	0.114584*	
6.36292	6.38983*	5.02721*	0.139006	0.00821849*	
24.7311	24.8406*	19.2960*	0.743336	0.0272359*	
10.8847	10.9554*	7.37357*	0.699959	0.00253088*	
14.2056	14.3040*	9.32292*	1.18401	0.000677877*	
4.25400	4.28600*	2.66559*	0.815304	0.000115009*	
7.12447	7.18118*	4.30974*	1.85440	4.67500E-05*	
0	0*	0*	0	0*	
0.415612	0.420899*	0.153215*	0.106473	0.00301772*	
2.56239	2.58650*	1.36567*	2.00030	2.63233E-06*	
0.251436	0.254713*	0.0888179*	0.210973	0.000349852*	
0.413188	0.417872*	0.180674*	0.974027	2.45314E-08*	
0.00715051	0.00724602*	0.00241038*	0.0177454	2.63296E-06*	
0.0368068	0.0373059*	0.0120388*	0.101543	7.37336E-06*	
0.00321142	0.00325746*	0.000926071*	0.00985857	1.19650E-06*	
0.00962392	0.00975209*	0.00326287*	0.0256323	2.31759E-06*	
0.0482646	0.0489043*	0.0165184*	0.335191	6.10509E-10*	
0.0213214	0.0216337*	0.00582336*	0.423919	7.00293E-12*	
7.31776	6.85118*	30.4738*	90.1404	98.6238*	
0.000181799	0.000184374*	5.40027E-05*	0.0108444	1.67088E-14*	
lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	
0	0*	0*	0	0*	
0.0431044	0.0428538*	0.000243582*	0.0472941	3.24507E-06*	
0	0*	0*	0	0*	
0.0753180	0.0734775*	0.00178884*	0.116086	1.51138E-06*	
0.267939	0.262988*	0.00481202*	0.739508	4.46952E-07*	
0.115145	0.113348*	0.00174647*	0.606225	3.20575E-08*	
0.447540	0.440643*	0.00670350*	3.24180	1.06238E-07*	
0.196972	0.194336*	0.00256160*	3.05262	9.87209E-09*	
0.257069	0.253737*	0.00323881*	5.16366	2.64416E-09*	
0.0769815	0.0760288*	0.000926033*	3.55566	4.48609E-10*	
0.128926	0.127386*	0.00149722*	8.08730	1.82356E-10*	
0	0*	0*	0	0*	
0.00752103	0.00746627*	5.32275E-05*	0.464342	1.17711E-08*	
0.0463697	0.0458816*	0.000474439*	8.72362	1.02678E-11*	
0.00455006	0.00451831*	3.08556E-05*	0.920086	1.36465E-09*	
0.00747715	0.00741257*	6.27668E-05*	4.24787	9.56884E-14*	
0.000129398	0.000128536*	8.37372E-07*	0.0773904	1.02703E-11*	
0.000666067	0.000661764*	4.18232E-06*	0.442845	2.87609E-11*	
5.81147E-05	5.77837E-05*	3.21720E-07*	0.0429947	4.66711E-12*	
0.000174157	0.000172991*	1.13353E-06*	0.111786	9.04013E-12*	
0.000873409	0.000867505*	5.73854E-06*	1.46182	2.38138E-15*	
0.000385838	0.000383756*	2.02305E-06*	1.84877	2.73160E-17*	
0.132424	0.121532*	0.0105867*	393.115	0.000384697*	
3.28989E-06	3.27059E-06*	1.87607E-08*	0.0472941	6.51753E-20*	

%	%	%	%	%	
0	0	0	0	0	
0.645371	0.651900	0.237912	0.00692971	0.737619	
0	0	0	0	0	
2.11366	2.09506	3.27484	0.0318812	0.643919	
11.0268	10.9964	12.9188	0.297835	0.279250	
6.24604	6.24710	6.18020	0.321820	0.0264003	
24.2768	24.2857	23.7216	1.72094	0.0874902	
13.2633	13.2955	11.2523	2.01159	0.0100920	
17.3100	17.3594	14.2270	3.40270	0.00270305	
6.19137	6.21273	4.85859	2.79859	0.000547757	
10.3691	10.4094	7.85539	6.36536	0.000222659	
0	0	0	0	0	
0.548292	0.553021	0.253135	0.331278	0.0130278	
4.33639	4.35949	2.89439	7.98380	1.45778E-05	
0.391269	0.394765	0.173091	0.774294	0.00178156	
0.797128	0.802906	0.436520	4.43183	1.54871E-07	
0.0128211	0.0129398	0.00541252	0.0750421	1.54490E-05	
0.0659958	0.0666201	0.0270332	0.429408	4.32635E-05	
0.00575817	0.00581712	0.00207950	0.0416901	7.02048E-06	
0.0172560	0.0174151	0.00732682	0.108394	1.35986E-05	
0.104547	0.105504	0.0448101	1.71240	4.32754E-09	
0.0512355	0.0517757	0.0175249	2.40253	5.50686E-11	
2.22651	2.07612	11.6119	64.6842	98.1969	
0.000479933	0.000484763	0.000178538	0.0675190	1.44345E-13	

lb/h	lb/h	lb/h	lb/h	lb/h	
0	0*	0*	0	0*	0*
0.691500	0.687480*	0.00390766*	0.758714	5.20589E-05*	0.000940911*
0	0*	0*	0	0*	0*
2.26474	2.20940*	0.0537886*	3.49058	4.54458E-05*	0.000821387*
11.8149	11.5966*	0.212189*	32.6091	1.97086E-05*	0.000356213*
6.69249	6.58805*	0.101509*	35.2351	1.86325E-06*	3.36764E-05*
26.0120	25.6111*	0.389622*	188.420	6.17479E-06*	0.000111603*
14.2113	14.0211*	0.184816*	220.243	7.12259E-07*	1.28734E-05*
18.5472	18.3068*	0.233676*	372.552	1.90773E-07*	3.44803E-06*
6.63391	6.55181*	0.0798013*	306.410	3.86590E-08*	6.98723E-07*
11.1103	10.9775*	0.129023*	696.926	1.57146E-08*	2.84025E-07*
0	0*	0*	0	0*	0*
0.587482	0.583204*	0.00415770*	36.2706	9.19462E-07*	1.66183E-05*
4.64634	4.59742*	0.0475397*	874.123	1.02885E-09*	1.85955E-08*
0.419235	0.416310*	0.00284299*	84.7752	1.25737E-07*	2.27257E-06*
0.854104	0.846727*	0.00716976*	485.228	1.09303E-11*	1.97555E-10*
0.0137375	0.0136460*	8.88996E-05*	8.21615	1.09034E-09*	1.97068E-08*
0.0707130	0.0702561*	0.000444015*	47.0146	3.05340E-09*	5.51872E-08*
0.00616974	0.00613460*	3.41554E-05*	4.56453	4.95484E-10*	8.95537E-09*
0.0184894	0.0183656*	0.000120341*	11.8678	9.59745E-10*	1.73464E-08*
0.112019	0.111262*	0.000735997*	187.486	3.05425E-13*	5.52024E-12*
0.0548976	0.0546015*	0.000287844*	263.046	3.88657E-15*	7.02458E-14*
2.38566	2.18943*	0.190722*	7082.09	0.00693043*	0.125260491*
0.000514237	0.000511220*	2.93245E-06*	7.39246	1.01874E-17*	1.84127E-16*

GB F/W/B	GB Flashing	GB Working	Liquid To GB	PW Breathing
Solved	Solved	Solved	Solved	Solved
MIX-105	--	--	MIX-106	--
--	MIX-105	MIX-105	Gunbarrel	MIX-101
95.0183	97.8	76.1390	91.9457	76.2171
1.46621	12.8800	1.46621	34.6959	0.454295
100	100	100	0	100
0	0	0	9.86394	0
0	0	0	90.1361	0
100	100	100	100	100
59.2098	59.4502	47.2788	25.1051	18.0936
0.0146213	0.130953	0.0120787	52.7653	0.00142997
1.80963	1.77388	0.0347403	436.114	0.000390065
107.148	105.458	1.64248	10948.7	0.00705769
7328.21	805.311	135.981	207.498	4.93555
913.646	100.402	16.9535	25.8699	0.615341
0.0164814	0.0161559	0.000316401	3.97196	3.55257E-06
0.358184	0.352648	0.00538049	25.6025	1.45673E-05
0.997449	0.977393	0.998085	0.00278864	0.999538
2.04436	2.05266	1.63241	0.846021	0.624725
			33.4700	
-108478	-105961	-2446.93	-5.17981E+07	-40.1854
-1012.42	-1004.77	-1489.78	-4730.98	-5693.84
0.410005	0.414349	0.404272	0.820833	0.445656
1.08917	1.08841	1.11605	1.22626	1.32691
0.00781528	0.00787941	0.00834181	0.557748	0.00999099
33.3687	3.75628	43.1141	0.659886	436.174
0.00965793	0.00979773	0.00925756	0.226680	0.0119153
			0.00320989	
2985.07	3001.71	2159.35	450.307	17.8079
18953.1	18983.3	17068.4	6064.76	-668.818
3234.98	3252.74	2354.00	530.888	69.1815
20555.2	20586.0	18631.1	7282.91	408.674

PW F/W/B/L	PW Flashing	PW Loding	PW to Tanks	PW Working	Sep Condensate	Sep PW
Solved	Solved	Solved	Solved	Solved	Solved	Solved
MIX-101	--	--	Gunbarrel	--	--	--
--	MIX-101	MIX-101	--	MIX-101	MIX-106	MIX-106
%	%	%	%	%	%	%
0	0*	0*	0	0*	0*	0*
3.91422	22.1417*	0.831929*	0.000501856	0.831929*	0.109989*	0*
0	0*	0*	0	0*	0*	0*
1.77165	9.95718*	0.387469*	0.000291482	0.387469*	0.269973*	0*
2.65041	17.6463*	0.114584*	0.000379722	0.114584*	1.71983*	0*
0.856249	5.87118*	0.00821849*	8.65655E-05	0.00821849*	1.40986*	0*
2.80424	19.2264*	0.0272359*	0.000386890	0.0272359*	7.53925*	0*
1.07142	7.39240*	0.00253088*	0.000106362	0.00253088*	7.09929*	0*
0.810666	5.60062*	0.000677877*	5.02083E-05	0.000677877*	12.0088*	0*
0.274296	1.89570*	0.000115009*	1.92975E-05	0.000115009*	8.26917*	0*
0.303258	2.09633*	4.67500E-05*	1.50751E-05	4.67500E-05*	18.8081*	0*
0	0*	0*	0	0*	0*	0*
0.0581073	0.383886*	0.00301772*	0.000709053	0.00301772*	1.07989*	0*
0.0866152	0.598809*	2.63233E-06*	3.68196E-06	2.63233E-06*	20.2880*	0*
0.0295505	0.202232*	0.000349852*	0.000284353	0.000349852*	2.13979*	0*
0.00648622	0.0448431*	2.45314E-08*	2.22514E-07	2.45314E-08*	9.87901*	0*
0.000832347	0.00573896*	2.63296E-06*	6.65818E-06	2.63296E-06*	0.179982*	0*
0.00376415	0.0259803*	7.37336E-06*	2.13955E-05	7.37336E-06*	1.02990*	0*
0.000362882	0.00250175*	1.19650E-06*	4.37146E-06	1.19650E-06*	0.0999900*	0*
0.00101913	0.00703214*	2.31759E-06*	6.26087E-06	2.31759E-06*	0.259974*	0*
0.000793223	0.00548404*	6.10509E-10*	2.59214E-08	6.10509E-10*	3.39966*	0*
0.000103493	0.000715510*	7.00293E-12*	3.00288E-09	7.00293E-12*	4.29957*	0*
85.3560	6.89493*	98.6238*	99.9971	98.6238*	0*	100*
8.58414E-07	5.93475E-06*	1.67088E-14*	2.46079E-11	1.67088E-14*	0.109989*	0*
lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h
0	0*	0*	0	0*	0*	0*
0.000420480	0.000344037*	1.77910E-05*	0.00197284	5.54062E-05*	0.0472941*	0*
0	0*	0*	0	0*	0*	0*
0.000190317	0.000154714*	8.28614E-06*	0.00114584	2.58053E-05*	0.116086*	0*
0.000284717	0.000274189*	2.45041E-06*	0.00149272	7.63125E-06*	0.739508*	0*
9.19814E-05	9.12262E-05*	1.75755E-07*	0.000340297	5.47349E-07*	0.606225*	0*
0.000301242	0.000298739*	5.82449E-07*	0.00152090	1.81391E-06*	3.24180*	0*
0.000115095	0.000114863*	5.41236E-08*	0.000418117	1.68556E-07*	3.05262*	0*
8.70846E-05	8.70224E-05*	1.44966E-08*	0.000197374	4.51464E-08*	5.16366*	0*
2.94659E-05	2.94553E-05*	2.45949E-09*	7.58604E-05	7.65954E-09*	3.55566*	0*
3.25771E-05	3.25728E-05*	9.99764E-10*	5.92617E-05	3.11354E-09*	8.08730*	0*
0	0*	0*	0	0*	0*	0*
6.24210E-06	5.96481E-06*	6.45350E-08*	0.00278735	2.00980E-07*	0.464342*	0*
9.30452E-06	9.30428E-06*	5.62931E-11*	1.44741E-05	1.75312E-10*	8.72362*	0*
3.17442E-06	3.14227E-06*	7.48169E-09*	0.00111782	2.33000E-08*	0.920086*	0*
6.96774E-07	6.96771E-07*	5.24611E-13*	8.74723E-07	1.63378E-12*	4.24787*	0*
8.94137E-08	8.91718E-08*	5.63066E-11*	2.61739E-05	1.75354E-10*	0.0773904*	0*
4.04359E-07	4.03681E-07*	1.57682E-10*	8.41078E-05	4.91064E-10*	0.442845*	0*
3.89821E-08	3.88721E-08*	2.55874E-11*	1.71846E-05	7.96862E-11*	0.0429947*	0*
1.09478E-07	1.09265E-07*	4.95624E-11*	2.46121E-05	1.54351E-10*	0.111786*	0*
8.52109E-08	8.52108E-08*	1.30559E-14*	1.01899E-07	4.06597E-14*	1.46182*	0*
1.11176E-08	1.11176E-08*	1.49760E-16*	1.18046E-08	4.66393E-16*	1.84877*	0*
0.00916925	0.000107133*	0.00210910*	393.098	0.00656832*	0*	393.115*
9.22140E-11	9.22140E-11*	3.57323E-19*	9.67359E-11	1.11280E-18*	0.0472941*	0*

%	%	%	%	%	%	%
0	0	0	0	0	0*	0*
2.87202	8.04355	0.737619	0.000446871	0.737619	0.0196221*	0*
0	0	0	0	0	0*	0*
2.43651	6.77988	0.643919	0.000486479	0.643919	0.0902746*	0*
5.34540	17.6204	0.279250	0.000929381	0.279250	0.843346*	0*
2.27621	7.72739	0.0264003	0.000279267	0.0264003	0.911262*	0*
7.45467	25.3050	0.0874902	0.00124814	0.0874902	4.87299*	0*
3.53556	12.0776	0.0100920	0.000425938	0.0100920	5.69599*	0*
2.67511	9.15021	0.00270305	0.000201065	0.00270305	9.63505*	0*
1.08112	3.69929	0.000547757	9.23034E-05	0.000547757	7.92448*	0*
1.19527	4.09081	0.000222659	7.21068E-05	0.000222659	18.0241*	0*
0	0	0	0	0	0*	0*
0.207596	0.679024	0.0130278	0.00307417	0.0130278	0.938043*	0*
0.396955	1.35872	1.45778E-05	2.04780E-05	1.45778E-05	22.6069*	0*
0.124530	0.421945	0.00178156	0.00145423	0.00178156	2.19248*	0*
0.0338873	0.115994	1.54871E-07	1.41080E-06	1.54871E-07	12.5491*	0*
0.00404163	0.0137969	1.54490E-05	3.92346E-05	1.54490E-05	0.212489*	0*
0.0182776	0.0624585	4.32635E-05	0.000126077	4.32635E-05	1.21591*	0*
0.00176205	0.00601438	7.02048E-06	2.57597E-05	7.02048E-06	0.118049*	0*
0.00494857	0.0169058	1.35986E-05	3.68934E-05	1.35986E-05	0.306928*	0*
0.00465308	0.0159273	4.32754E-09	1.84530E-07	4.32754E-09	4.84881*	0*
0.000673488	0.00230532	5.50686E-11	2.37148E-08	5.50686E-11	6.80298*	0*
70.3308	2.81278	98.1969	99.9910	98.1969	0*	100*
6.13691E-06	2.10063E-05	1.44345E-13	2.13496E-10	1.44345E-13	0.191186*	0*
lb/h	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**
0	0*	0*	0	0*	0*	0*
0.00674553	0.00551920*	0.000285412*	0.0316492	0.000888852*	0.758714*	0*
0	0*	0*	0	0*	0*	0*
0.00572266	0.00465211*	0.000249156*	0.0344544	0.000775941*	3.49058*	0*
0.0125548	0.0120905*	0.000108052*	0.0658226	0.000336505*	32.6091*	0*
0.00534616	0.00530227*	1.02153E-05*	0.0197788	3.18131E-05*	35.2351*	0*
0.0175088	0.0173634*	3.38532E-05*	0.0883980	0.000105428*	188.420*	0*
0.00830400	0.00828722*	3.90495E-06*	0.0301666	1.21611E-05*	220.243*	0*
0.00628305	0.00627856*	1.04591E-06*	0.0142403	3.25726E-06*	372.552*	0*
0.00253923	0.00253832*	2.11948E-07*	0.00653730	6.60064E-07*	306.410*	0*
0.00280734	0.00280697*	8.61550E-08*	0.00510689	2.68310E-07*	696.926*	0*
0	0*	0*	0	0*	0*	0*
0.000487582	0.000465922*	5.04094E-06*	0.217725	1.56989E-05*	36.2706*	0*
0.000932331	0.000932307*	5.64068E-09*	0.00145034	1.75666E-08*	874.123*	0*
0.000292486	0.000289524*	6.89351E-07*	0.102994	2.14683E-06*	84.7752*	0*
7.95914E-05	7.95912E-05*	5.99255E-11*	9.99183E-05	1.86625E-10*	485.228*	0*
9.49261E-06	9.46692E-06*	5.97779E-09*	0.00277876	1.86165E-08*	8.21615*	0*
4.29288E-05	4.28568E-05*	1.67403E-08*	0.00892930	5.21338E-08*	47.0146*	0*
4.13853E-06	4.12686E-06*	2.71649E-09*	0.00182441	8.45989E-09*	4.56453*	0*
1.16228E-05	1.16001E-05*	5.26179E-09*	0.00261294	1.63867E-08*	11.8678*	0*
1.09287E-05	1.09287E-05*	1.67449E-12*	1.30691E-05	5.21482E-12*	187.486*	0*
1.58183E-06	1.58183E-06*	2.13081E-14*	1.67958E-06	6.63592E-14*	263.046*	0*
0.165187	0.00193003*	0.0379960*	7081.77	0.118330*	0*	7082.09*
1.44138E-08	1.44138E-08*	5.58525E-17*	1.51206E-08	1.73940E-16*	7.39246*	0*

PW F/W/B	PW Flashing	PW Loding	PW to Tanks	PW Working	Sep Condensate	Sep PW
Solved	Solved	Solved	Solved	Solved	Solved	Solved
MIX-101	--	--	Gunbarrel	--	--	--
--	MIX-101	MIX-101	--	MIX-101	MIX-106	MIX-106
81.6503	97.8	76.2171	70	76.2171	92*	92*
0.454295	12.8800	0.454295	14.6959	0.454295	34.6959*	34.6959*
100	100	100	0	100	0	0
0	0	0	100	0	100	100
0	0	0	0	0	0	0
100	100	100	100	100	100	100
21.8640	44.1605	18.0936	18.0164	18.0936	89.9238	18.0153
0.00171049	0.0962890	0.00142997	62.2807	0.00142997	41.4048	62.0499
0.0107424	0.00155380	0.00213853	393.109	0.00665997	42.9990	393.115
0.234871	0.0686165	0.0386937	7082.41	0.120503	3866.63	7082.09
137.312	0.712610	27.0591	113.718	84.2694	93.3859	114.135
17.1194	0.0888449	3.37360	14.1778	10.5063	11.6429	14.2299
9.78373E-05	1.41514E-05	1.94769E-05	3.58029	6.06565E-05	0.391618	3.58035
0.000603219	0.000260064	7.98653E-05	14.1590	0.000248723	11.4449*	14.1576*
0.999605	0.987389	0.999538	0.000747898	0.999538	0.0127280	0.00170152
0.754907	1.52475	0.624725	0.998589	0.624725	0.663872	0.994887
			10.0005		76.5028	9.99583
-1025.81	-79.1821	-220.316	-4.83553E+07	-686.124	-3.59378E+06	-4.82044E+07
-4367.54	-1153.98	-5693.84	-6827.52	-5693.84	-929.434	-6806.52
0.436350	0.424599	0.445656	0.978677	0.445656	0.534341	0.977228
1.26297	1.11921	1.32691	1.32922	1.32691	1.05884	1.32847
0.0101745	0.00882388	0.00999099	0.995713	0.00999099	0.303184	0.765515
371.338	5.72087	436.174	0.998068	436.174	0.457125	0.770180
0.0116560	0.0119943	0.0119153	0.347035	0.0119153	0.0676796	0.356821
			0.00503205?		0.00117956	0.00486861
339.349	2240.82	17.8079	0.0793467	17.8079	4567.21	0
5101.95	19084.2	-668.818	-1058.01	-668.818	19114.0	-1059.76
411.692	2437.17	69.1815	50.3931	69.1815	4924.55	50.3100
6357.68	20771.8	408.674	1.76705	408.674	20622.2	0

MANLEY GAS TESTING, INC.

P.O. DRAWER 193 ODESSA, TEXAS 79760
OFFICE(432)367-3024 FAX(432)367-1166 E-MAIL: MANLEYGAST@AOL.COM

CHARGE..... 23 - 5316

REC. NO. 0
TEST NUMBER.. 61376
SAMPLE TYPE.. SPOT

STATION NO. ...
PRODUCER ..... ENLINK
SAMPLE NAME.... HORNED FROG INLET
RECEIVED FROM.. ENLINK MIDSTREAM
LOCATION ..... MIDLAND TEXAS

DATE SAMPLED..... 05-24-23
TIME SAMPLED..... 14:45
DATE RUN..... 05-25-23

FLOWING PRESSURE ..... 0 PSIG

FLOWING TEMPERATURE ..... 0 F

SAMPLED BY: 182

CYLINDER NO. .. NONE

* FRACTIONAL ANALYSIS
CALCULATED @ 14.650 PSIA AND 60F

	MOL%	GPM (REAL)
HYDROGEN SULFIDE...	0.0000	
NITROGEN.....	1.6257	
CARBON DIOXIDE.....	0.9110	
METHANE.....	70.5411	
ETHANE.....	13.3016	3.553
PROPANE.....	7.6090	2.093
ISO-BUTANE.....	1.0390	0.340
NOR-BUTANE.....	2.6962	0.849
ISO-PENTANE.....	0.6014	0.220
NOR-PENTANE.....	0.7084	0.256
HEXANES	0.6864	0.299
HEPTANES + ...	0.2802	0.123
TOTALS	100.0000	7.733

'Z' FACTOR (DRY) = 0.9955
'Z' FACTOR (WET) = 0.9950

..CALCULATED SPECIFIC GRAVITIES..

IDEAL, DRY..... 0.8129
IDEAL, WET 0.8096
REAL, DRY 0.8162
REAL, WET 0.8133

..CALCULATED GROSS HEATING VALUES..

BTU/CF - IDEAL, DRY 1358.8
BTU/CF - IDEAL, WET 1335.0
BTU/CF - REAL, DRY 1364.9
BTU/CF - REAL, WET 1341.7

* BASED ON GPA STANDARDS 2261-20 / 2145-16 / 2172-19
DISTRIBUTION AND REMARKS:

T. LEBLANC / B. BROWN / S. TIRMZI / A. ORTIZ / L. GUELKER

ANALYZED BY: JT

APPROVED: KC

MANLEY GAS TESTING INC.
120 DOCK ROAD - ODESSA, TEXAS-432-367-3024

A SAMPLE OF ENLINK-HORNED FROG INLET 5-24-23

CAPILLARY EXTENDED
C-6+ ANALYSIS
(NORMALIZED TO 100%)

COMPONENT	MOL%	WT%
NEOHEXANE	0.417	0.390
2,3DMC4+CYC5	4.109	3.346
2MPENTANE	12.519	11.712
3MPENTANE	6.559	6.136
N-HEXANE	16.993	15.903
2,2 DMPENTANE	0.173	0.189
MCYCLOPENTANE	7.459	6.815
2,4 DMPENTANE	0.398	0.433
2,2,3 TMBUTANE	0.029	0.031
BENZENE	2.055	1.743
3,3 DMPENTANE	0.070	0.076
CYCLOHEXANE	9.676	8.841
2MHEXANE	2.365	2.573
2,3 DMPENTANE	1.247	1.357
3MHEXANE	2.815	3.063
DIMCYCPENTANES(GROUPED)	6.278	6.692
N-HEPTANE	6.601	7.181
MCYCLOHEXANE	9.307	9.921
2,2DMHEXANE	0.432	0.536
2,3,3TMPENTANE	0.000	0.000
TOLUENE	1.771	1.771
2,3DMHEXANE	0.096	0.118
2M3EPENTANE	0.004	0.005
2MHEPTANE	1.474	1.828
4MHEPTANE	0.278	0.344
3,4DMHEXANE	0.095	0.118
3MHEPTANE	0.747	0.926
TRIMCYCPENTANES(GROUPED)	0.114	0.139
DIMCYCHEXANES(GROUPED)	1.322	1.610
N-OCTANE	1.158	1.436
2,3,5TRIMHEXANE	0.030	0.042
2,2,4TRIMHEXANE	0.076	0.106
2,2DIMHEPTANE	0.013	0.018
2,2,3TRIMHEXANE	0.013	0.018
2,5DIMHEPTANE	0.020	0.028
I-NONANE	0.000	0.000
2,4DIMHEPTANE	0.008	0.011
E-CYCHEXANE	0.221	0.269
3,3DIMHEPTANE	0.104	0.145
2,6DIMHEPTANE	0.030	0.041
E-BENZENE	0.060	0.070
2,3DIMHEPTANE	0.030	0.042
M-XYLENE	0.339	0.391
P-XYLENE	0.022	0.026
3,4DIMHEPTANE	0.126	0.175
3EHEPTANE	0.032	0.045

MANLEY GAS TESTING INC.
120 DOCK ROAD - ODESSA, TEXAS-432-367-3024

A SAMPLE OF ENLINK-HORNED FROG INLET 5-24-23

CAPILLARY EXTENDED
C-6+ ANALYSIS
(NORMALIZED TO 100%)

COMPONENT	MOL%	WT%
4MOCTANE	0.074	0.103
3MOCTANE	0.044	0.061
O-XYLENE	0.082	0.095
IC4CYCPENTANE	0.036	0.049
N-NONANE	0.328	0.457
I-DECANE	0.031	0.047
1E1MCYC6	0.030	0.041
IC3BENZENE	0.027	0.036
2,3DMOCTANE	0.167	0.258
3EOCTANE	0.529	0.817
NC4CYCC6	0.034	0.051
NC3BENZENE	0.208	0.272
M+P E-TOLUENE	0.129	0.168
O-E-TOLUENE	0.046	0.060
2,2DMOCTANE	0.084	0.130
TERTBUTYLBENZENE	0.007	0.010
1,3,5TMBENZENE	0.015	0.019
3,6DMOCTANE	0.045	0.069
IC4BENZENE	0.123	0.180
N-DECANE	0.128	0.198
UNKNOWN C-6'S	0.000	0.000
UNKNOWN C-7'S	0.000	0.000
UNKNOWN C-8'S	0.020	0.024
UNKNOWN C-9'S	0.088	0.122
UNK C10'S THRU C14'S	0.040	0.073
UNK C15'S THRU C16'S	0.000	0.000
UNK C17'S THRU C20'S	0.000	0.000
TOTAL	100.000	100.000

COMPONENT GROUPINGS (PARAFFINS-NAPTHENES-AROMATICS)

	MOL%	WT%
TOTAL C-6'S	59.787	54.886
TOTAL C-7'S	31.054	33.287
TOTAL C-8'S	6.464	7.935
TOTAL C-9'S	1.507	2.059
TOTAL C-10'S	1.148	1.760
TOTAL C-11 THRU C-14	0.040	0.073
TOTAL C-15 THRU C-16	0.000	0.000
TOTAL C-17 THRU C-20	0.000	0.000
TOTAL	100.000	100.000

* C6+ CHARACTERIZATION

MOL.WEIGHT = 92.110
SP.GRAVITY = 3.1803
BTU/FT3(DRY) = 4966.863
BTU/FT3(WET) = 4881.316
CU.FT./GAL = 24.746
GAL/CU.FT. = 0.040411
MOL% C6+ AROMATICS = 4.884

MANLEY GAS TESTING, INC.

P.O. DRAWER 193 ODESSA, TEXAS 79760
OFFICE(432)367-3024 FAX(432)367-1166 E-MAIL: MANLEYGAST@AOL.COM

CHARGE..... 162 - 0 - 0 DATE SAMPLED..... 05-10-23
RECORD NO ... 0
TEST NUMBER.. 27064 DATE RUN 05-19-23

METER NUMBER ...
A SAMPLE OF ... HORNED FROG CONDENSATE
RECEIVED FROM .. ENLINK PERMIAN LLC.
LOCATION ..... FT. WORTH TEXAS

PRESSURE ..... 20 PSIG TEMPERATURE ..... 92 F

FRACTIONAL ANALYSIS
CALCULATED @ 14.696 PSIA AND 60F

	MOLE%	LIQUID%	WEIGHT%
NITROGEN.....	0.00	0.00	0.00
CARBON DIOXIDE.	0.00	0.00	0.00
METHANE.....	0.11	0.05	0.02
ETHANE.....	0.27	0.18	0.09
PROPANE.....	1.72	1.17	0.85
ISO-BUTANE.....	1.41	1.14	0.92
NOR-BUTANE.....	7.54	5.86	4.91
ISO-PENTANE....	7.10	6.41	5.74
NOR-PENTANE....	12.01	10.74	9.71
HEXANES+	69.84	74.45	77.76
	100.00	100.00	100.00

TOTAL SP. GRAVITY.... 0.6979
TOTAL VAPOR PRESS.. 21.094
TOTAL MOLECULAR WT.. 89.250

** CAPILLARY EXTENDED HEXANES+ CALCULATIONS **

SP. GRAVITY C6+ .. 0.7290 VAPOR PRESS C6+ .. 2.797 CF/GAL C6+ .. 23.288
MOLECULAR WT C6+. 99.375 ..... LB/GAL C6+ .. 6.078

ANALYSIS BASED ON GPA STANDARDS 2177-13 & 2186-14

DISTRIBUTION / REMARKS :

S. TIRMZI

RUN BY: K.CASWELL APPROVED [1]

MANLEY GAS TESTING INC.

120 DOCK ROAD - ODESSA, TEXAS-432-367-3024

A SAMPLE OF HORNED FROG CONDENSATE (5/10/23)

CAPILLARY EXTENDED
C-6+ ANALYSIS
(NORMALIZED TO 100%)

COMPONENT	MOL%	LIQ%	WT%
NEOHEXANE	0.18	0.17	0.16
2,3DMC4+CYC5	1.58	1.25	1.19
2MPENTANE	7.21	6.92	6.25
3MPENTANE	4.05	3.83	3.52
N-HEXANE	11.84	11.27	10.29
2,2 DMPENTANE	0.09	0.10	0.10
MCYCLOPENTANE	5.99	4.91	5.08
2,4 DMPENTANE	0.04	0.04	0.04
2,2,3 TMBUTANE	0.00	0.00	0.00
BENZENE	1.54	1.00	1.21
3,3 DMPENTANE	0.06	0.07	0.06
CYCLOHEXANE	7.92	6.24	6.71
2MHEXANE	3.11	3.35	3.14
2,3 DMPENTANE	1.40	1.47	1.41
3MHEXANE	3.03	3.22	3.05
DIMCYCPENTANES(GROUPED)	4.34	4.07	4.29
N-HEPTANE	6.87	7.34	6.93
MCYCLOHEXANE	10.11	9.41	9.99
2,2DMHEXANE	1.28	1.53	1.47
2,3,3TMPENTANE	0.00	0.00	0.00
TOLUENE	3.06	2.37	2.83
2,3DMHEXANE	0.36	0.42	0.41
2M3EPENTANE	0.00	0.00	0.00
2MHEPTANE	4.12	4.90	4.73
4MHEPTANE	0.16	0.19	0.18
3,4DMHEXANE	0.00	0.00	0.00
3MHEPTANE	1.75	2.06	2.01
TRIMCYCPENTANES(GROUPED)	0.27	0.29	0.31
DIMCYCHEXANES(GROUPED)	2.83	3.02	3.19
N-OCTANE	2.47	2.92	2.84
2,3,5TRIMHEXANE	0.39	0.50	0.50
2,2,4TRIMHEXANE	0.05	0.07	0.07
2,2DIMHEPTANE	0.08	0.10	0.10
2,2,3TRIMHEXANE	0.05	0.07	0.07
2,5DIMHEPTANE	0.00	0.00	0.00
I-NONANE	0.00	0.00	0.00
2,4DIMHEPTANE	0.00	0.00	0.00
E-CYCHEXANE	0.87	0.90	0.98
3,3DIMHEPTANE	0.35	0.45	0.45
2,6DIMHEPTANE	0.13	0.16	0.16
E-BENZENE	0.26	0.23	0.28
2,3DIMHEPTANE	0.00	0.00	0.00
M-XYLENE	1.47	1.31	1.57
P-XYLENE	0.37	0.33	0.39
3,4DIMHEPTANE	0.37	0.47	0.47
3EHEPTANE	0.00	0.00	0.00

MANLEY GAS TESTING INC.

120 DOCK ROAD - ODESSA, TEXAS-432-367-3024

A SAMPLE OF HORNED FROG CONDENSATE (5/10/23)

CAPILLARY EXTENDED
C-6+ ANALYSIS
(NORMALIZED TO 100%)

4MOCTANE	0.10	0.13	0.12
3MOCTANE	0.23	0.29	0.29
O-XYLENE	0.14	0.12	0.15
IC4CYCPENTANE	0.34	0.40	0.43
N-NONANE	0.93	1.22	1.21
I-DECANE	0.16	0.23	0.23
1E1MCYC6	0.18	0.21	0.23
IC3BENZENE	0.16	0.17	0.20
2,3DMOCTANE	0.95	1.33	1.35
3EOCTANE	2.29	3.20	3.27
NC4CYCC6	0.00	0.00	0.00
NC3BENZENE	0.20	0.20	0.24
M+P E-TOLUENE	0.16	0.16	0.19
O-E-TOLUENE	0.40	0.40	0.48
2,2DMOCTANE	1.30	1.87	1.87
TERTBUTYLBENZENE	0.34	0.39	0.45
1,3,5TMBENZENE	0.08	0.08	0.10
3,6DMOCTANE	0.19	0.26	0.27
IC4BENZENE	0.45	0.52	0.61
N-DECANE	0.48	0.68	0.69
UNKNOWN C-6'S	0.00	0.00	0.00
UNKNOWN C-7'S	0.00	0.00	0.00
UNKNOWN C-8'S	0.04	0.05	0.05
UNKNOWN C-9'S	0.67	0.87	0.86
UNK C10'S THRU C14'S	0.16	0.27	0.28
UNK C15'S THRU C16'S	0.00	0.00	0.00
UNK C17'S THRU C20'S	0.00	0.00	0.00
TOTAL	100.00	100.00	100.00

COMPONENT GROUPINGS (PARAFFINS-NAPTHENES-AROMATICS)

	MOL%	LIQ%	WT%		
TOTAL C-6'S	40.31	35.59	34.41	SP. GRAV. C6+ =	0.7290
TOTAL C-7'S	32.11	31.44	31.84	MOL. WT. C6+ =	99.375
TOTAL C-8'S	16.39	18.27	18.56	GAL/LB. C6+ =	16.364
TOTAL C-9'S	4.87	5.95	6.17	CF/GAL. C6+ =	23.288
TOTAL C-10'S	6.16	8.48	8.74	LB/GAL. C6+ =	6.078
TOTAL C-11 THRU C-14	0.16	0.27	0.28		
TOTAL C-15 THRU C-16	0.00	0.00	0.00	MOL% 6+ AROMATICS =	8.63
TOTAL C-17 THRU C-20	0.00	0.00	0.00		
TOTAL	100.00	100.00	100.00		

ICE CATALYST SIZING PROGRAM

rev 2.1.3

Report Date: 7/19/2023

Customer	Enlink Midstream	Housing	
Sales Person	KW	Element	MCC-7140-2
Project	Horned Frog CS	Contact	Mike Luckett
Engine Name	Caterpillar G3516B G3516B 1380 BHP @ 1400 RPM		

Engine Power	1380.0	BHP	ACFM	9127.0	CU. FT/MIN	Exhaust O2	8	%
Exhaust Mass Flow	14949.0	LBS/HR	ACFH	547620	CU. FT/HR	Exhaust CO2	6.4	%
Process Temperature	993.0	F	SCFM	3271.5	CU. FT/MIN	Exhaust H2O	11.6	%
Exhaust Pressure	14.5	PSI	SCFH	196288	CU. FT/HR	Exhaust N2	74	%
Exhaust Density	0.0273	LBS/FT^3	Std Temp	68.0	F	Max Pressure Drop	12.0	in wc
Molecular Weight	29.35	AMU	Std Pressure	14.6959	PSI	Propane in Fuel	0.00	%

ACS Part Name	RN15.440X24.750X3.500-300				
OEM Part Name	MCC-7140-2				
Type	NG/Diesel (Lean)	Layers	1		
Geometry	Rectangular	Modules/Layer	3	Cell Count	300cpsi
X	15.440in	Guard Bed	No	Depth	3.500in
Y	24.750in				

Open Area	7.145	ft^2	Part Volume	0.695	ft^3	Part Weight	46	lbs
Linear Velocity	1277	ft/min	Total Volume	2.084	ft^3	Total Weight	138	lbs
Pressure Drop	1.4	in wc	Space Velocity	94193	GHSV			

Inlet Emissions

	g/bhp-hr	lb/hr	tons/year	ppmv	ppmvd	ppmvd%O2
NOx	0.55	1.67	7.33	71.40	80.77	40.21
CO	3.11	9.47	41.51	663.77	750.87	373.85
VOC	1.24	3.78	16.59	168.47	190.58	94.89
H2CO	0.43	1.31	5.73	85.52	96.74	48.16
VOC+H2CO	1.67	5.09	22.32	253.99	287.32	143.05

Target Emissions

	min %DRE	g/bhp-hr	lb/hr	tons/year	ppmv	ppmvd	ppmvd%O2
NOx	0.00	0.55	1.67	7.33	71.40	80.77	40.21
CO	80.08	0.62	1.89	8.27	132.20	149.55	74.46
VOC	60.37	0.49	1.50	6.57	66.77	75.53	37.60
H2CO	80.00	0.09	0.26	1.15	17.10	19.35	9.63
VOC+H2CO	65.41	0.58	1.76	7.72	83.87	94.88	47.24

Emissions with Catalyst

	%DRE	g/bhp-hr	lb/hr	tons/year	ppmv	ppmvd	ppmvd%O2
NOx	0.00	<0.55	<1.67	<7.33	<71.40	<80.77	<40.21
CO	80.08	<0.62	<1.89	<8.27	<132.20	<149.55	<74.46
VOC	60.37	<0.49	<1.50	<6.57	<66.77	<75.53	<37.60
H2CO	80.00	<0.09	<0.26	<1.15	<17.10	<19.35	<9.63
VOC+H2CO	65.41	<0.58	<1.76	<7.72	<83.87	<94.88	<47.24

Safety Value: 2 VOC Molecular Weight: 44.1 O2 Reference Value: 15 Uptime (TPY): 100% (8760 hours)

G3516B

GAS COMPRESSION APPLICATION

GAS ENGINE SITE SPECIFIC TECHNICAL DATA

CATERPILLAR®

ENGINE SPEED (rpm):	1400	RATING STRATEGY:	STANDARD
COMPRESSION RATIO:	8	RATING LEVEL:	CONTINUOUS
AFTERCOOLER TYPE:	SCAC	FUEL SYSTEM:	CAT WIDE RANGE WITH AIR FUEL RATIO CONTROL
AFTERCOOLER - STAGE 2 INLET (°F):	130		
AFTERCOOLER - STAGE 1 INLET (°F):	201	**SITE CONDITIONS:**	
JACKET WATER OUTLET (°F):	210	FUEL:	Gas Analysis
ASPIRATION:	TA	FUEL PRESSURE RANGE(psig): (See note 1)	7.0-40.0
COOLING SYSTEM:	JW+OC+1AC, 2AC	FUEL METHANE NUMBER:	63.9
CONTROL SYSTEM:	ADEM3	FUEL LHV (Btu/scf):	1058
EXHAUST MANIFOLD:	DRY	ALTITUDE(ft):	2600
COMBUSTION:	LOW EMISSION	MAXIMUM INLET AIR TEMPERATURE(°F):	100
NOx EMISSION LEVEL (g/bhp-hr NOx):	0.5	STANDARD RATED POWER:	1380 bhp@1400rpm
SET POINT TIMING:	30		

				MAXIMUM RATING	SITE RATING AT MAXIMUM INLET AIR TEMPERATURE		
RATING		**NOTES**	**LOAD**	**100%**	**100%**	**75%**	**50%**
ENGINE POWER	(WITHOUT FAN)	(2)	bhp	1380	1380	1035	690
INLET AIR TEMPERATURE			°F	100	100	100	100
ENGINE DATA							
FUEL CONSUMPTION (LHV)		(3)	Btu/bhp-hr	7435	7435	7963	8553
FUEL CONSUMPTION (HHV)		(3)	Btu/bhp-hr	8210	8210	8793	9444
AIR FLOW (@inlet air temp, 14.7 psia)	(WET)	(4)(5)	ft3/min	3286	3286	2577	1802
AIR FLOW	(WET)	(4)(5)	lb/hr	13970	13970	10959	7661
FUEL FLOW (60ºF, 14.7 psia)			scfm	162	162	130	93
INLET MANIFOLD PRESSURE		(6)	in Hg(abs)	93.8	93.8	76.1	53.5
EXHAUST TEMPERATURE - ENGINE OUTLET		(7)	°F	988	988	973	983
EXHAUST GAS FLOW (@engine outlet temp, 14.5 psia)	(WET)	(8)(5)	ft3/min	9130	9130	7100	5002
EXHAUST GAS MASS FLOW	(WET)	(8)(5)	lb/hr	14485	14485	11373	7958
EMISSIONS DATA - ENGINE OUT							
NOx (as NO2)		(9)(10)	g/bhp-hr	0.50	0.50	0.50	0.50
CO		(9)(10)	g/bhp-hr	2.83	2.83	3.03	2.97
THC (mol. wt. of 15.84)		(9)(10)	g/bhp-hr	4.78	4.78	5.12	5.20
NMHC (mol. wt. of 15.84)		(9)(10)	g/bhp-hr	1.76	1.76	1.88	1.91
NMNEHC (VOCs) (mol. wt. of 15.84)		(9)(10)(11)	g/bhp-hr	0.74	0.74	0.79	0.80
HCHO (Formaldehyde)		(9)(10)	g/bhp-hr	0.43	0.43	0.42	0.41
CO2		(9)(10)	g/bhp-hr	491	491	524	570
EXHAUST OXYGEN		(9)(12)	% DRY	9.1	9.1	8.8	8.4
HEAT REJECTION							
HEAT REJ. TO JACKET WATER (JW)		(13)	Btu/min	23277	23277	21905	20584
HEAT REJ. TO ATMOSPHERE		(13)	Btu/min	6110	6110	5092	4074
HEAT REJ. TO LUBE OIL (OC)		(13)	Btu/min	4475	4475	3978	3363
HEAT REJ. TO A/C - STAGE 1 (1AC)		(13)(14)	Btu/min	13221	13221	11024	4008
HEAT REJ. TO A/C - STAGE 2 (2AC)		(13)(14)	Btu/min	5743	5743	5389	3485
COOLING SYSTEM SIZING CRITERIA							
TOTAL JACKET WATER CIRCUIT (JW+OC+1AC)		(14)(15)	Btu/min	44857			
TOTAL AFTERCOOLER CIRCUIT (2AC)		(14)(15)	Btu/min	6030			
A cooling system safety factor of 0% has been added to the cooling system sizing criteria.							

CONDITIONS AND DEFINITIONS

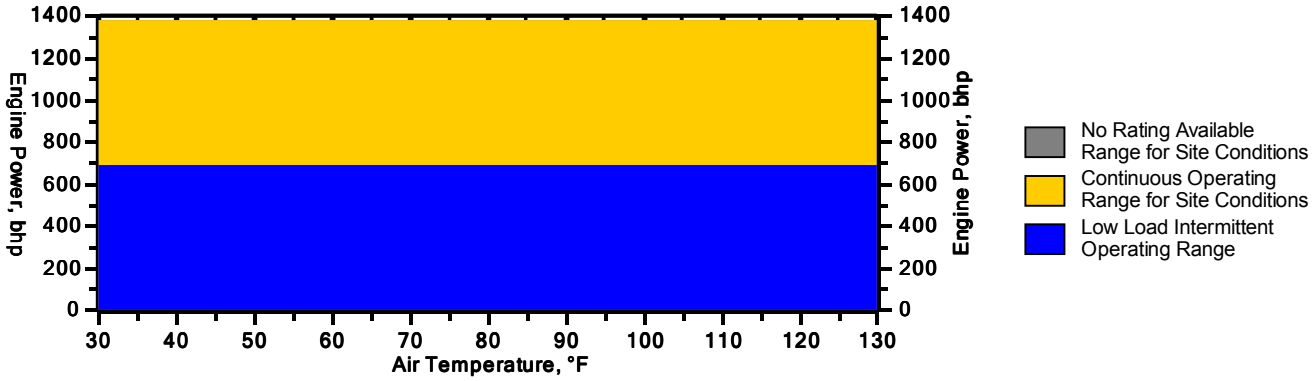
Engine rating obtained and presented in accordance with ISO 3046/1, adjusted for fuel, site altitude and site inlet air temperature. 100% rating at maximum inlet air temperature is the maximum engine capability for the specified fuel at site altitude and maximum site inlet air temperature. Maximum rating is the maximum capability at the specified aftercooler inlet temperature for the specified fuel at site altitude and reduced inlet air temperature. Lowest load point is the lowest continuous duty operating load allowed. No overload permitted at rating shown.

For notes information consult page three.

PREPARED BY:
Data generated by Gas Engine Rating Pro Version 6.07.00
Ref. Data Set EM1748-02-001, Printed 22May2018

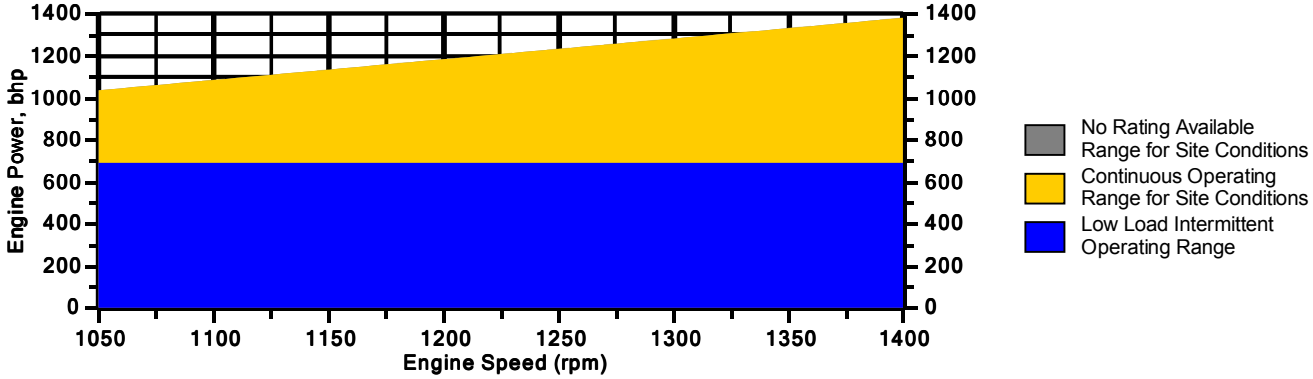
Engine Power vs. Inlet Air Temperature

Data represents temperature sweep at 2600 ft and 1400 rpm



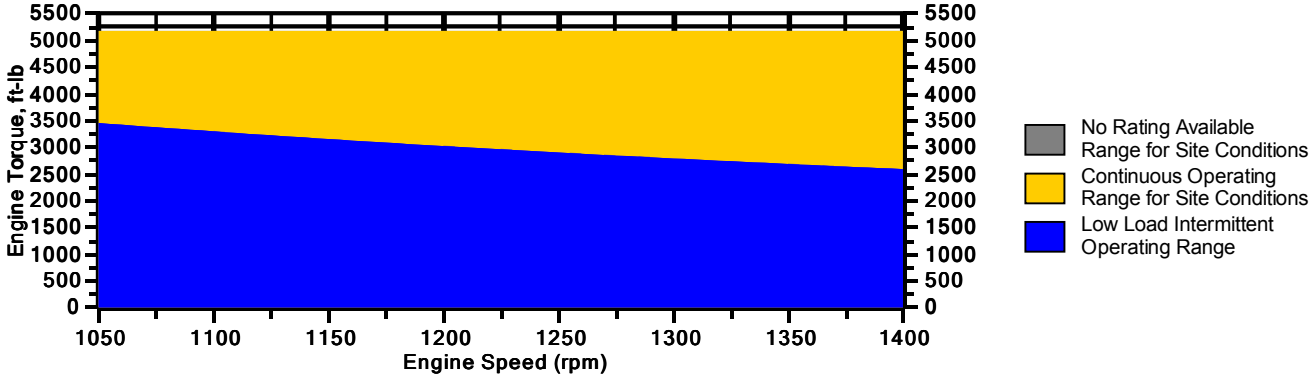
Engine Power vs. Engine Speed

Data represents speed sweep at 2600 ft and 100 ºF



Engine Torque vs. Engine Speed

Data represents speed sweep at 2600 ft and 100 ºF



Note: At site conditions of 2600 ft and 100°F inlet air temp., constant torque can be maintained down to 1050 rpm. The minimum speed for loading at these conditions is 1050 rpm.

NOTES

1. Fuel pressure range specified is to the engine fuel pressure regulator. Additional fuel train components should be considered in pressure and flow calculations.

2. Engine rating is with two engine driven water pumps. Tolerance is ± 3% of full load.

3. Fuel consumption tolerance is ± 3.0% of full load data.

4. Air flow value is on a 'wet' basis. Flow is a nominal value with a tolerance of ± 5 %.

5. Inlet and Exhaust Restrictions must not exceed A&I limits based on full load flow rates from the standard technical data sheet.

6. Inlet manifold pressure is a nominal value with a tolerance of ± 5 %.

7. Exhaust temperature is a nominal value with a tolerance of (+)63°F, (-)54°F.

8. Exhaust flow value is on a "wet" basis. Flow is a nominal value with a tolerance of ± 6 %.

9. Emissions data is at engine exhaust flange prior to any after treatment.

10. Values listed are higher than nominal levels to allow for instrumentation, measurement, and engine-to-engine variations. They indicate the maximum values expected under steady state conditions. Fuel methane number cannot vary more than ± 3. THC, NMHC, and NMNEHC do not include aldehydes. An oxidation catalyst may be required to meet Federal, State or local CO or HC requirements.

11. VOCs - Volatile organic compounds as defined in US EPA 40 CFR 60, subpart JJJJ

12. Exhaust Oxygen level is the result of adjusting the engine to operate at the specified NOx level. Tolerance is ± 0.5.

13. Heat rejection values are nominal. Tolerances, based on treated water, are ± 10% for jacket water circuit, ± 50% for radiation, ± 20% for lube oil circuit, and ± 5% for aftercooler circuit.

14. Aftercooler heat rejection includes an aftercooler heat rejection factor for the site elevation and inlet air temperature specified. Aftercooler heat rejection values at part load are for reference only. Do not use part load data for heat exchanger sizing.

15. Cooling system sizing criteria are maximum circuit heat rejection for the site, with applied tolerances.

Constituent	Abbrev	Mole %	Norm
Water Vapor	H2O	0.0000	0.0000
Methane	CH4	77.0700	77.0737
Ethane	C2H6	12.9600	12.9606
Propane	C3H8	5.0700	5.0702
Isobutane	iso-C4H1O	0.2440	0.2440
Norbutane	nor-C4H1O	0.5726	0.5726
Isopentane	iso-C5H12	0.0417	0.0417
Norpentane	nor-C5H12	0.0325	0.0325
Hexane	C6H14	0.0000	0.0000
Heptane	C7H16	0.0000	0.0000
Nitrogen	N2	3.4399	3.4401
Carbon Dioxide	CO2	0.5645	0.5645
Hydrogen Sulfide	H2S	0.0000	0.0000
Carbon Monoxide	CO	0.0000	0.0000
Hydrogen	H2	0.0000	0.0000
Oxygen	O2	0.0000	0.0000
Helium	HE	0.0000	0.0000
Neopentane	neo-C5H12	0.0000	0.0000
Octane	C8H18	0.0000	0.0000
Nonane	C9H20	0.0000	0.0000
Ethylene	C2H4	0.0000	0.0000
Propylene	C3H6	0.0000	0.0000
TOTAL (Volume %)		99.9952	99.9999

Fuel Makeup:	Gas Analysis
Unit of Measure:	English

Calculated Fuel Properties

Caterpillar Methane Number:	63.9
Lower Heating Value (Btu/scf):	1058
Higher Heating Value (Btu/scf):	1169
WOBBE Index (Btu/scf):	1266
THC: Free Inert Ratio:	23.97
Total % Inerts (% N2, CO2, He):	4%
RPC (%) (To 905 Btu/scf Fuel):	100%
Compressibility Factor:	0.997
Stoich A/F Ratio (Vol/Vol):	10.99
Stoich A/F Ratio (Mass/Mass):	15.73
Specific Gravity (Relative to Air):	0.699
Fuel Specific Heat Ratio (K):	1.289

CONDITIONS AND DEFINITIONS

Caterpillar Methane Number represents the knock resistance of a gaseous fuel. It should be used with the Caterpillar Fuel Usage Guide for the engine and rating to determine the rating for the fuel specified. A Fuel Usage Guide for each rating is included on page 2 of its standard technical data sheet.

RPC always applies to naturally aspirated (NA) engines, and turbocharged (TA or LE) engines only when they are derated for altitude and ambient site conditions.

Project specific technical data sheets generated by the Caterpillar Gas Engine Rating Pro program take the Caterpillar Methane Number and RPC into account when generating a site rating.

Fuel properties for Btu/scf calculations are at 60F and 14.696 psia.

Caterpillar shall have no liability in law or equity, for damages, consequently or otherwise, arising from use of program and related material or any part thereof.

FUEL LIQUIDS

Field gases, well head gases, and associated gases typically contain liquid water and heavy hydrocarbons entrained in the gas. To prevent detonation and severe damage to the engine, hydrocarbon liquids must not be allowed to enter the engine fuel system. To remove liquids, a liquid separator and coalescing filter are recommended, with an automatic drain and collection tank to prevent contamination of the ground in accordance with local codes and standards.

To avoid water condensation in the engine or fuel lines, limit the relative humidity of water in the fuel to 80% at the minimum fuel operating temperature.

ICE CATALYST SIZING PROGRAM

rev 2.1.3

Report Date: 9/29/2023

Customer	Enlink Midstream	Housing	
Sales Person	KW	Element	MCC-7140-2
Project	Horned Frog CS	Contact	Lance Green
Engine Name	Caterpillar G3606 A4 0.5 Caterpillar G3606 A4 0.5		

Engine Power	1875.0	BHP	ACFM	12008.0	CU. FT/MIN	Exhaust O2	8	%
Exhaust Mass Flow	22520.0	LBS/HR	ACFH	720480	CU. FT/HR	Exhaust CO2	6.4	%
Process Temperature	809.0	F	SCFM	4928.3	CU. FT/MIN	Exhaust H2O	11.6	%
Exhaust Pressure	14.5	PSI	SCFH	295700	CU. FT/HR	Exhaust N2	74	%
Exhaust Density	0.0313	LBS/FT^3	Std Temp	68.0	F	Max Pressure Drop	12.0	in wc
Molecular Weight	29.35	AMU	Std Pressure	14.6959	PSI	Propane in Fuel	0.00	%

ACS Part Name	RN15.440X24.750X3.500-300				
OEM Part Name	MCC-7140-2				
Type	NG/Diesel (Lean)	Layers	1		
Geometry	Rectangular	Modules/Layer	4	Cell Count	300cpsi
X	15.440in	Guard Bed	No	Depth	3.500in
Y	24.750in				

Open Area	9.526	ft^2	Part Volume	0.695	ft^3	Part Weight	46	lbs
Linear Velocity	1260	ft/min	Total Volume	2.779	ft^3	Total Weight	183	lbs
Pressure Drop	1.3	in wc	Space Velocity	106423	GHSV			

Inlet Emissions

	g/bhp-hr	lb/hr	tons/year	ppmv	ppmvd	ppmvd%O2
NOx	0.50	2.07	9.06	58.54	66.23	32.97
CO	2.20	9.09	39.86	423.08	478.60	238.29
VOC+H2CO	0.69	2.85	12.50	95.15	107.64	53.59

Target Emissions

	min %DRE	g/bhp-hr	lb/hr	tons/year	ppmv	ppmvd	ppmvd%O2
NOx	0.00	0.50	2.07	9.06	58.54	66.23	32.97
CO	77.27	0.50	2.07	9.06	96.16	108.77	54.16
VOC+H2CO	56.52	0.30	1.24	5.44	42.37	47.93	23.86

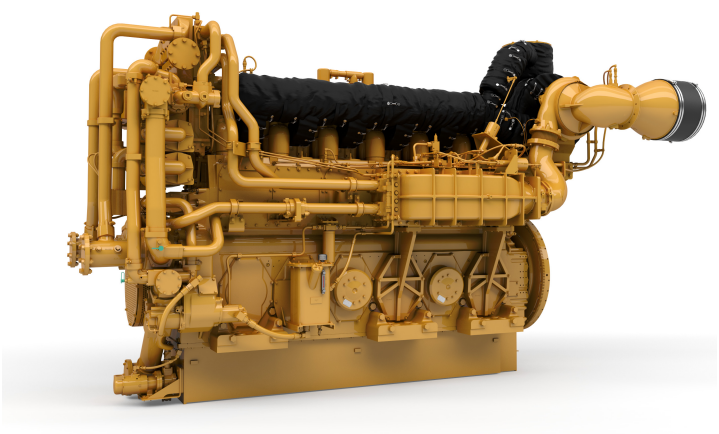
Emissions with Catalyst

	%DRE	g/bhp-hr	lb/hr	tons/year	ppmv	ppmvd	ppmvd%O2
NOx	0.00	<0.50	<2.07	<9.06	<58.54	<66.23	<32.97
CO	77.27	<0.50	<2.07	<9.06	<96.16	<108.77	<54.16
VOC+H2CO	56.52	<0.30	<1.24	<5.44	<42.37	<47.93	<23.86

Safety Value: 2 VOC Molecular Weight: 44.1 O2 Reference Value: 15 Uptime (TPY): 100% (8760 hours)

G3606 with ADEM™ A4 Gas Engine

1398-1499 bkW (1875-2010 bhp) @ 1000 rpm
0.5 g/bhp-hr NOx (NTE)



Shown with optional equipment

Cat® Engine Specifications

In-Line 6, 4-Stroke-Cycle

Bore
300 mm (11.8 in)

Stroke
300 mm (11.8 in)

Displacement
127.2 L (7762 cu. in)

Aspiration
Turbocharged-Aftercooled

Digital Engine Management Governor and Protection
Electronic (ADEM™ A4)

Combustion
Low Emission (Lean Burn)

Cooling System Capacity
Total.....420 L (111 Gal)
JW.....340 L (90 Gal)
SCAC.....80 L (21 Gal)

Lube Oil System (refill)
708 L (187 gal)

Oil Change Interval
5000 hours

Rotation (from flywheel end)
Counterclockwise

Flywheel Teeth
255

FEATURES AND BENEFITS

Engine Design
- Industry-leading power with ambient-based rating capability
- ADEM A4 engine control system provides complete engine control, monitoring, and protection while maintaining emissions.
- Widest fuel tolerance in the industry for application flexibility
- Proven reliability and durability with the lowest owning and operating costs
- Factory-installed thermostats

Emissions
Meets U.S. EPA Spark Ignited Stationary NSPS Emissions for 2010 with the use of an oxidation catalyst

Lean Burn Engine Technology
Lean-burn engines operate with large amounts of excess air. The excess air absorbs heat during combustion reducing the combustion temperature and pressure, greatly reducing levels of NOx. Lean-burn design also provides longer component life and excellent fuel consumption.

Ease of Operation
Side covers on block allow for inspection of internal components

Advanced Digital Engine Management
ADEM A4 engine management system integrates speed control, air/fuel ratio control, and ignition/detonation controls into a complete engine management system. ADEM A4 has improved: user interface, display system, shutdown controls, and system diagnostics.

Full Range of Attachments
Large variety of factory-installed attachments reduces packaging time.

Testing
Every engine is full-load tested to ensure proper engine performance.

Gas Engine Rating Pro (GERP)
GERP is a PC-based program designed to provide site performance capabilities for Cat natural gas engines for the gas compression industry. GERP provides engine data for your site's altitude, ambient temperature, fuel, engine coolant heat rejection, performance data, installation drawings, spec sheets, and pump curves.

Product Support Offered Through Global Cat Dealer Network
- More than 2,200 dealer outlets
- Cat factory-trained dealer technicians service every aspect of your Oil & Gas Engine
- Caterpillar parts and labor warranty
- Preventive maintenance agreements available for repair-before-failure options
- S•O•S program matches your oil and coolant samples against Caterpillar set standards to determine:
  - Internal engine component condition
  - Presence of unwanted fluids
  - Presence of combustion by-products
  - Site-specific oil change interval

Over 80 Years of Engine Manufacturing Experience
Over 60 years of natural gas engine production. Ownership of these manufacturing processes enables Caterpillar to produce high quality, dependable products.
- Cast engine blocks, heads, cylinder liners, and flywheel housings
- Machine critical components
- Assemble complete engine

Web Site
For all your Oil & Gas power requirements, visit www.cat.com

BUILT FOR IT.™

CAT®

STANDARD EQUIPMENT

G3606 with ADEM A4 Gas Engine

Air Inlet System
- Air cleaner — standard duty
- Inlet air adapter

Control System
- ADEM A4 control system — provides electronic governing integrated with air/fuel ratio control and individual cylinder ignition timing control
- Electrical system and instrumentation certified for Class I, Division 2, Group D hazardous location. Includes entire ADEM A4 system and optional control panel

Cooling System
- Compressor oil cooler connections
- Jacket water pump
- Jacket water thermostats and housing
- Aftercooler/oil cooler pump
- Aftercooler/oil cooler thermostats and housing
- Two-stage aftercooler
- Jacket water heater connections
- Standard ANSI connections

Exhaust System
- Dry exhaust manifolds
- Single vertical outlet adapter
- Form fitted soft wrap insulation

Flywheels & Flywheel Housings
- SAE standard rotation

Fuel System
- Gas admission valves — electronically controlled fuel supply pressure

Ignition System
- A4 control system — senses individual cylinder detonation and controls individual cylinder timing

Lube System
- Crankcase breather —top mounted
- Oil cooler
- Oil filter
- Oil pan drain valve - front and rear

Mounting System
- Engine mounting feet (four total)

Protection System
- Electronic shutoff system with purge cycle
- Crankcase explosion relief valves
- Gas shutoff valve

Starting System
- Air starting system

General
- Paint, Caterpillar yellow
- Single vibration damper with guard

OPTIONAL EQUIPMENT

Air Inlet System
- Heavy-duty air cleaner with precleaners

Charging System
- 35 Amp & 65 Amp charging alternators - CSA Approved

Exhaust System
- Flexible bellows adapters
- Exhaust expander
- Weld flanges

Fuel System
- Fuel filter
- Gas pressure regulator
- Flexible connection

Instrumentation
- LCD display panel
- Color HMI display
- Remote data monitoring and speed control
- Compatible with Cat Electronic Technician (ET) and Data View
- Modbus and Ethernet capable

Lube System
- Air or electric motor-driven prelube
- Duplex oil filter
- RH service
- Lube oil makeup system

Mounting System
- Mounting plates (set of four)
- Extra mounting feet (set of two)
- Extra mounting plates (set of two)

Power Take-offs
- Front stub shafts

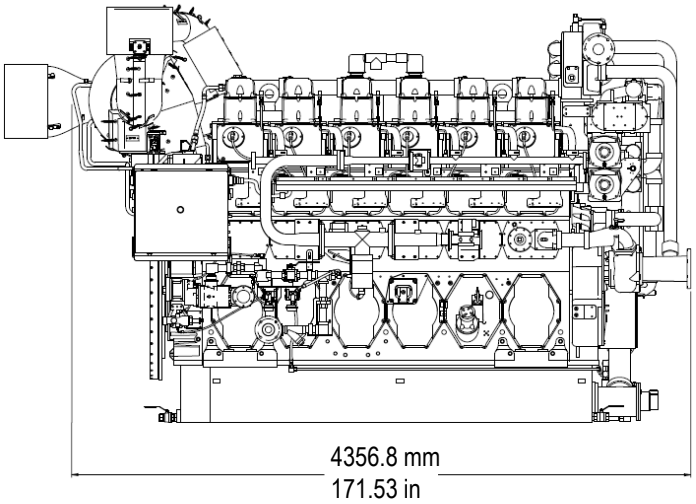
Starting System
- Air pressure reducing valve

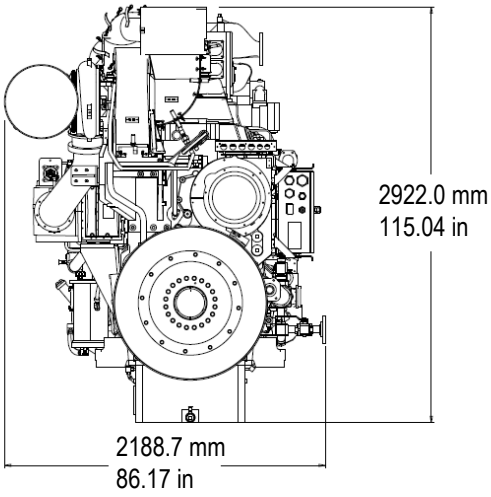
General
- Engine barring device
- Damper guard

Performance Number		EM0555-07	EM0556-06	EM0557-06
Rating	°C (°F)	54 (130)	43 (110)	32 (90)
Engine Power	bkW (bhp)	1398 (1875)	1454 (1950)	1499 (2010)
Engine Speed	rpm	1000	1000	1000
Max Altitude @ Rated Torque and 38°C (100°F)	m (ft)	2519.3 (8274)	2358 (7744)	2198 (7219)
Speed Turndown @ Max Altitude, Rated Torque, and 38°C (100°F)	%	25	25	25
Aftercooler Temperature				
Stage 1 (JW)	°C (°F)	88 (190)	88 (190)	88 (190)
Stage 2 (SCAC)	°C (°F)	54 (130)	43 (110)	32 (90)
Emissions (NTE)*				
NOx	g/bkW-hr (g/bhp-hr)	0.67 (0.5)	0.67 (0.5)	0.67 (0.5)
CO	g/bkW-hr (g/bhp-hr)	2.95 (2.2)	2.95 (2.2)	2.95 (2.2)
CO_2	g/bkW-hr (g/bhp-hr)	582 (434)	579 (432)	577 (430)
VOC**	g/bkW-hr (g/bhp-hr)	0.38 (0.29)	0.36 (0.27)	0.34 (0.26)
Fuel Consumption ***	MJ/bkW-hr (Btu/bhp-hr)	9.4 (6649)	9.39 (6638)	9.38 (6629)
Heat Balance				
Heat Rejection to Jacket Water	bkW (Btu/min)	387 (21987)	395 (22436)	401 (22785)
Heat Rejection to Oil Cooler	bkW (Btu/min)	206 (11709)	214 (12154)	220 (12514)
Heat Rejection to Aftercooler				
Stage 1 (JW)	bkW (Btu/min)	228 (12970)	239 (13591)	248 (14097)
Stage 2 (SCAC)	bkW (Btu/min)	115 (6550)	148 (8423)	176 (9997)
Heat Rejection to Exhaust LHV To 25°C (77°F)	bkW (Btu/min)	1259 (71578)	1288 (73268)	1312 (74619)
Heat Rejection to Atmosphere	bkW (Btu/min)	98 (5575)	96 (5465)	93 (5305)
Exhaust System				
Exhaust Gas Flow Rate	m^3/min (scfm)	334.76 (11822)	343.28 (12123)	350.11 (12364)
Exhaust Stack Temperature	°C (°F)	446 (835)	446 (835)	446 (836)
Intake System				
Air Inlet Flow Rate	m^3/min (scfm)	129.86 (4586)	133.06 (4699)	135.61 (4789)
Gas Pressure	kPag (psig)	400 - 485 (58 - 70)	400 - 485 (58 - 70)	400 - 485 (58 - 70)

All technical data is based on 100% load and speed
* listed as not to exceed
** Volatile organic compounds as defined in U.S. EPA 40 CFR 60, subpart JJJJ
*** ISO 3046/1

G3606 with ADEM A4 Gas Engine





Note: General confi guration not to be used for installation

Dimensions		
Length	4356.8 mm	171.53 in
Width	2188.7 mm	86.17 in
Height	2922.0 mm	115.04 in
Weight	16,670 kg	36,883 lb

Rating Definitions and Conditions

Engine performance is obtained in accordance with SAE J1995, ISO3046/1, BS5514/1, and DIN6271/1 standards.

Conditions: Power for gas engines is based on fuel having an LHV of 33.74 kJ/L (905 Btu/cu ft) at 101 kPa (29.91 in Hg) and 15°C (59°F). Fuel rate is based on a cubic meter at 100 kPa (29.61 in Hg) and 15.6°C (60.1°F). Air flow is based on a cubic foot at 100 kPa (29.61 in Hg) and 25°C (77°F). Exhaust flow is based on a cubic foot at 100 kPa (29.61 in Hg) and stack temperature.

To find your nearest dealer, please visit:
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Subject to change without notice.
LEHW0234-01

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ICE CATALYST SIZING PROGRAM

rev 2.1.3

Report Date: 5/18/2023

Customer	Enlink Midstream	Housing	
Sales Person	KW	Element	36.5" 3-Way
Project	Horned Frog CS	Contact	Mike Luckett
Engine Name	Waukesha VHP - P9394GSI S5 2500 BHP 1200 RPM		

Engine Power	2500.0	BHP	ACFM	10423.0	CU. FT/MIN	Exhaust O2	0.2	%
Exhaust Mass Flow	15368.0	LBS/HR	ACFH	625380	CU. FT/HR	Exhaust CO2	9.9	%
Process Temperature	1066.0	F	SCFM	3557.3	CU. FT/MIN	Exhaust H2O	18.7	%
Exhaust Pressure	14.5	PSI	SCFH	213435	CU. FT/HR	Exhaust N2	71.2	%
Exhaust Density	0.0246	LBS/FT^3	Std Temp	68.0	F	Max Pressure Drop	27.0	in wc
Molecular Weight	27.75	AMU	Std Pressure	14.6959	PSI	Propane in Fuel	0.00	%

Type	Stoichiometric	Layers	2		
Geometry	Round	Modules/Layer	1	Cell Count	300cpsi
Diameter	36.500in	Guard Bed	No	Depth	3.500in

Open Area	7.266	ft^2	Part Volume	2.119	ft^3	Part Weight	118 lbs
Linear Velocity	1434	ft/min	Total Volume	4.239	ft^3	Total Weight	235 lbs
Pressure Drop	3.1	in wc	Space Velocity	50354	GHSV		

Inlet Emissions

	g/bhp-hr	lb/hr	tons/year	ppmv	ppmvd	ppmvd%O2
NOx	11.97	65.97	289.16	2588.95	3183.18	911.69
CO	6.06	33.40	146.39	2152.77	2646.90	758.09
H2CO	0.05	0.28	1.21	16.57	20.37	5.83
VOC+H2CO	0.60	3.31	14.49	140.66	172.95	49.53

Target Emissions

	min %DRE	g/bhp-hr	lb/hr	tons/year	ppmv	ppmvd	ppmvd%O2
NOx	97.49	0.30	1.65	7.25	64.89	79.78	22.85
CO	93.40	0.40	2.20	9.66	142.10	174.71	50.04
H2CO	20.00	0.04	0.22	0.97	13.25	16.30	4.67
VOC+H2CO	58.33	0.25	1.38	6.04	60.64	74.55	21.35

Emissions with Catalyst

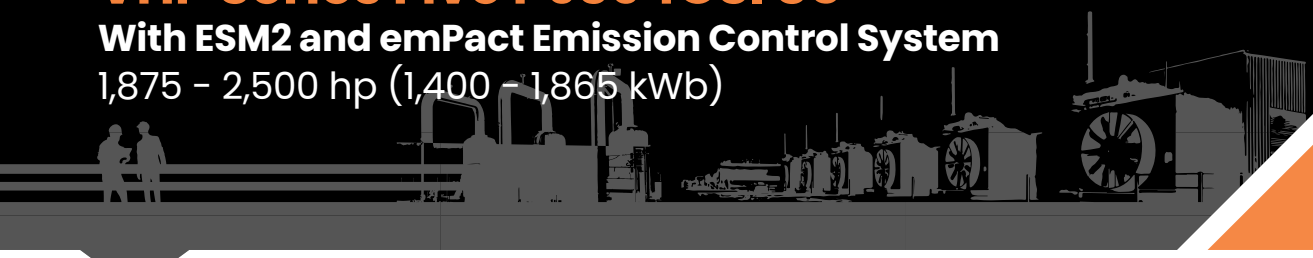
	%DRE	g/bhp-hr	lb/hr	tons/year	ppmv	ppmvd	ppmvd%O2
NOx	97.49	<0.30	<1.65	<7.25	<64.89	<79.78	<22.85
CO	93.40	<0.40	<2.20	<9.66	<142.10	<174.71	<50.04
H2CO	20.00	<0.04	<0.22	<0.97	<13.25	<16.30	<4.67
VOC+H2CO	58.33	<0.25	<1.38	<6.04	<60.64	<74.55	<21.35

Safety Value: 2 VOC Molecular Weight: 44.1 O2 Reference Value: 15 Uptime (TPY): 100% (8760 hours)

VHP Series Five P9394GSI S5

With ESM2 and emPact Emission Control System

1,875 - 2,500 hp (1,400 - 1,865 kWb)

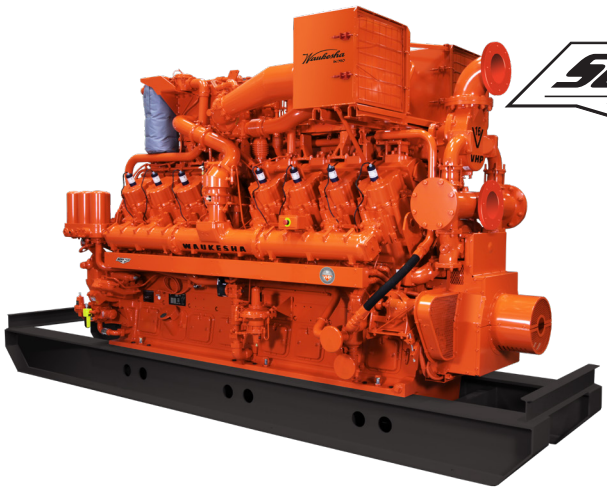


Technical Data

Cylinders	V16
Piston displacement	9,388 cu. in. (154 L)
Compression ratio	9.7:1
Bore & stroke	9.375" x 8.5" (238 x 216)
Jacket water system capacity	148 gal. (560 L)
Lube oil capacity	239 gal. (904 L)
Starting system	Single air/gas starter: 90-150 psi Single air/gas starter: 50-90 psi Dual air/gas starters: 90-150 psi Dual air/gas starters: 50-90 psi 2 electric starters, 24V each

Dimensions l x w x h inch (mm)
170 (4,318) x 78 (1,981) x 113 (2,870)

Weights lb (kg)
34,000 (15,422)



The Series Five family of Waukesha* VHP* engines gets more powerful with the addition of the 2500 hp P9394GSI S5. The P9394GSI S5 has the same features and benefits as the 1900 hp L7044GSI S5 and 1500 hp L7042GSI S5, creating a family of engines with common controls, operation, and service parts.

Series Five rich-burn engines combine the most advanced technology available with the history and experience of the VHP platform, resulting in a 16-cylinder engine with more power, better fuel flexibility, lower fuel consumption and lifecycle costs, and longer service intervals.

Although Series Five engines are capable of higher power levels than previous versions, the stresses on the components have not increased. This is made possible by enhanced rich-burn combustion through the Miller Cycle, an improved cylinder head design that reduces temperatures in key regions, and an optimized piston design.

The Miller Cycle moves work from the piston to the turbocharger, reducing combustion and exhaust temperatures and making Series Five engines the most fuel efficient VHP engines ever.

The improved cylinder head design reduces key internal temperatures by up to 40%, increasing reliability and extending the life of the head.

The Series Five piston design has been optimized to reduce unburned hydrocarbons, which improves emissions and fuel consumption while lowering the temperature of the piston itself, improving fuel flexibility even at a higher power rating.

Improvements to the ignition system allow for 4,000-hour spark plug intervals with low-cost, non-precious metal plugs. Matching 4,000 oil change intervals reduce operating costs and trips to site.

Series Five engines come standard with ESM*2, Waukesha's next-generation engine controller. ESM2 uses a 12" full color customer interface panel, allowing users to see all engine parameters, trend data, view manuals, and walk through troubleshooting steps, eliminating the need for a laptop computer.

Waukesha's emPact Emission Control System is the option of choice for reducing emissions. emPact optimizes the interaction between the Series Five engine, AFR2 air/fuel ratio control, and the Waukesha-supplied 3-way (NSCR) catalyst to maintain emissions compliance even as engine speed, load, fuel, and environmental conditions change.

Performance Data

Intercooler Water Temperature 130°F (54°C)		1200 RPM	1000 RPM
	Power bhp (kWb)	2,500 (1,864)	2,085 (1,555)
	BSFC (LHV) Btu/bhp-hr (kJ/kWh)	6,974 (9,867)	6,982 (9,878)
	Fuel Consumption Btu/hr x 1000 (kW)	17,435 (5,110)	14,557 (4,267)
Engine-Out Emissions	NOx g/bhp-hr (mg/Nm³ @ 5% O_2)	12.02 (5,155)	11.52 (4,934)
	CO g/bhp-hr (mg/Nm³ @ 5% O_2)	6.08 (2,606)	6.52 (2,791)
	NMHC g/bhp-hr (mg/Nm³ @ 5% 0_2)	0.17 (74)	0.15 (63)
	THC g/bhp-hr (mg/Nm³ @ 5% O_2)	0.50 (214)	0.51 (219)
Heat Balance	Heat to Jacket Water Btu/hr x 1000 (kW)	4,810 (1,410)	4,222 (1,237)
	Heat to Lube Oil Btu/hr x 1000 (kW)	683 (200)	493 (145)
	Heat to Intercooler Btu/hr x 1000 (kW)	670 (196)	455 (133)
	Heat to Radiation Btu/hr x 1000 (kW)	627 (184)	595 (174)
	Total Exhaust Heat Btu/hr x 1000 (kW)	4,635 (1,358)	3,776 (1,107)
Intake/ Exhaust System	Induction Air Flow scfm (Nm³/hr)	3,267 (4,921)	2,726 (4,106)
	Exhaust Flow lb/hr (kg/hr)	15,190 (6,890)	12,676 (5,750)
	Exhaust Temperature °F (°C)	1,093 (589)	1,067 (575)

All data according to full load and subject to technical development and modification.

emPact catalyst-out emissions valid from 100% - 75% load and 1200 rpm to 900 rpm and assume proper engine/catalyst maintenance and manual adjustment as necessary.

Consult your local Waukesha representative for system application assistance. The manufacturer reserves the right to change or modify without notice, the design or equipment specifications as herein set forth without incurring any obligation either with respect to equipment previously sold or in the process of construction except where otherwise specifically guaranteed by the manufacturer.

INNIO* is a leading solutions provider of gas engines, power equipment, a digital platform and related services for power generation and gas compression at or near the point of use. With our Jenbacher* and Waukesha* product brands, INNIO pushes beyond the possible and looks boldly toward tomorrow. Our diverse portfolio of reliable, economical and sustainable industrial gas engines generates 200 kW to 10 MW of power for numerous industries globally. We can provide life cycle support to the more than 48,000 delivered gas engines worldwide. And, backed by our service network in more than 100 countries, INNIO connects with you locally for rapid response to your service needs. Headquartered in Jenbach, Austria, the business also has primary operations in Welland, Ontario, Canada, and Waukesha, Wisconsin, US.

Find your local support online:
www.innio.com/en/company/providers

IWK-119055-EN

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ICE CATALYST SIZING PROGRAM

rev 2.1.3

Report Date: 5/8/2023

Customer	Enlink Midstream	Housing	
Sales Person	KW	Element	MCC-7140-2
Project	G3608A4	Contact	Lance Green
Engine Name	Caterpillar G3608 G3608 - 2500bhp - 1000RPM		

Engine Power	2500.0	BHP	ACFM	16164.0	CU. FT/MIN	Exhaust O2	10.4	%
Exhaust Mass Flow	29271.0	LBS/HR	ACFH	969840	CU. FT/HR	Exhaust CO2	6.5	%
Process Temperature	812.0	F	SCFM	6618.4	CU. FT/MIN	Exhaust H2O	10.6	%
Exhaust Pressure	14.5	PSI	SCFH	397103	CU. FT/HR	Exhaust N2	72.6	%
Exhaust Density	0.0302	LBS/FT^3	Std Temp	68.0	F	Max Pressure Drop	12.0	in wc
Molecular Weight	28.41	AMU	Std Pressure	14.6959	PSI	Propane in Fuel	2.93	%

ACS Part Name	RN15.440X24.750X3.500-300				
OEM Part Name	MCC-7140-2				
Type	NG/Diesel (Lean)	Layers	1		
Geometry	Rectangular	Modules/Layer	4	Cell Count	300cpsi
X	15.440in	Guard Bed	No	Depth	3.500in
Y	24.750in				

Open Area	9.526	ft^2	Part Volume	0.695	ft^3	Part Weight	46	lbs
Linear Velocity	1697	ft/min	Total Volume	2.779	ft^3	Total Weight	183	lbs
Pressure Drop	1.6	in wc	Space Velocity	142918	GHSV			

Inlet Emissions

	g/bhp-hr	lb/hr	tons/year	ppmv	ppmvd	ppmvd%O2
NOx	0.30	1.67	7.31	35.15	39.30	24.93
CO	2.25	12.50	54.79	433.04	484.13	307.14
H2CO	0.12	0.67	2.92	21.54	24.08	15.28
VOC+H2CO	0.42	2.33	10.23	58.21	65.08	41.29

Target Emissions

	min %DRE	g/bhp-hr	lb/hr	tons/year	ppmv	ppmvd	ppmvd%O2
NOx	0.00	<0.30	<1.67	<7.31	<35.15	<39.30	<24.93
CO	82.22	<0.40	<2.22	<9.74	<76.99	<86.07	<54.60
H2CO	66.67	<0.04	<0.22	<0.97	<7.18	<8.03	<5.09
VOC+H2CO	28.57	<0.30	<1.67	<7.31	<38.96	<43.56	<27.64

Emissions with Catalyst

	%DRE	g/bhp-hr	lb/hr	tons/year	ppmv	ppmvd	ppmvd%O2
NOx	0.00	<0.30	<1.67	<7.31	<35.15	<39.30	<24.93
CO	82.22	<0.40	<2.22	<9.74	<76.99	<86.07	<54.60
H2CO	66.67	<0.04	<0.22	<0.97	<7.18	<8.03	<5.09
VOC+H2CO	28.57	<0.30	<1.67	<7.31	<38.96	<43.56	<27.64

Safety Value: 2 VOC Molecular Weight: 44.1 O2 Reference Value: 15 Uptime (TPY): 100% (8760 hours)

G3608

GAS ENGINE SITE SPECIFIC TECHNICAL DATA
Cat 3608 A4 2,500-hp

CATERPILLAR®

GAS COMPRESSION APPLICATION	
ENGINE SPEED (rpm):	1000
COMPRESSION RATIO:	7.6
AFTERCOOLER TYPE:	SCAC
AFTERCOOLER - STAGE 2 INLET (°F):	130
AFTERCOOLER - STAGE 1 INLET (°F):	174
JACKET WATER OUTLET (°F):	190
ASPIRATION:	TA
COOLING SYSTEM:	JW+1AC, OC+2AC
CONTROL SYSTEM:	ADEM4
EXHAUST MANIFOLD:	DRY
COMBUSTION:	LOW EMISSION
NOx EMISSION LEVEL (g/bhp-hr NOx):	0.3
SET POINT TIMING:	18

RATING STRATEGY:	STANDARD
RATING LEVEL:	CONTINUOUS
FUEL SYSTEM:	GAV WITH AIR FUEL RATIO CONTROL
SITE CONDITIONS:	
FUEL:	Nat Gas
FUEL PRESSURE RANGE(psig): (See note 1)	58.0-70.3
FUEL METHANE NUMBER:	84.7
FUEL LHV (Btu/scf):	905
ALTITUDE(ft):	500
INLET AIR TEMPERATURE(°F):	77
STANDARD RATED POWER:	2500 bhp@1000rpm

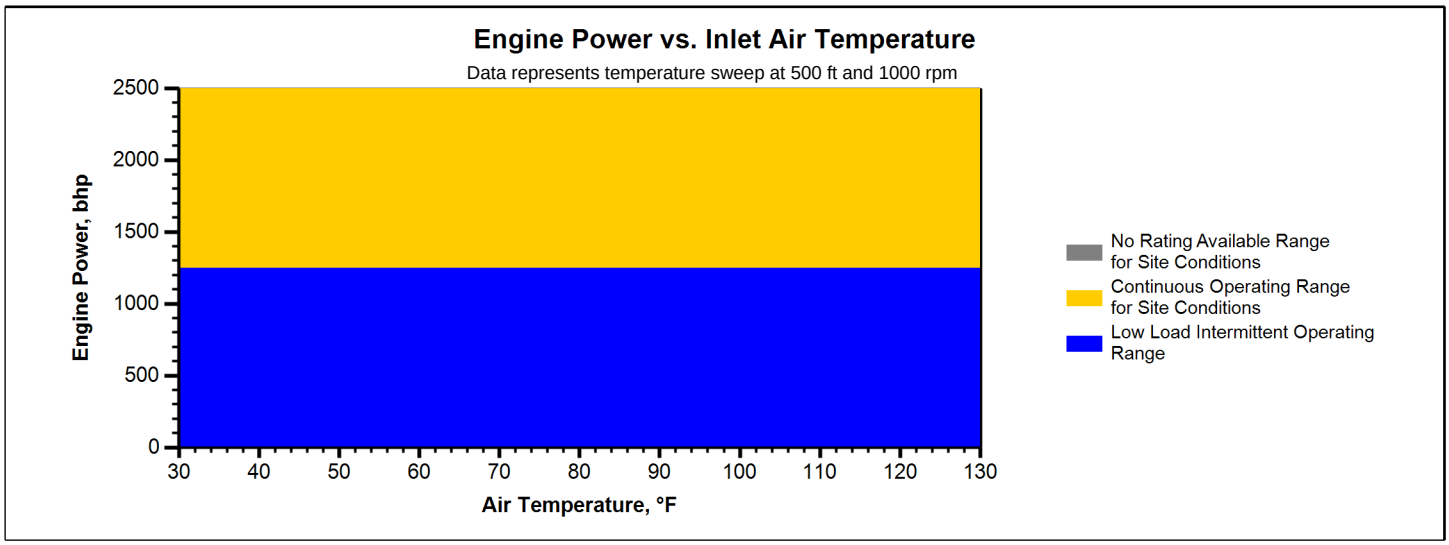
				MAXIMUM RATING	SITE RATING AT MAXIMUM INLET AIR TEMPERATURE		
RATING		**NOTES**	**LOAD**	**100%**	**100%**	**75%**	**50%**
ENGINE POWER	(WITHOUT FAN)	(2)	bhp	2500	2500	1875	1250
INLET AIR TEMPERATURE			°F	77	77	77	77
ENGINE DATA							
FUEL CONSUMPTION (LHV)		(3)	Btu/bhp-hr	6848	6848	7075	7574
FUEL CONSUMPTION (HHV)		(3)	Btu/bhp-hr	7596	7596	7848	8401
AIR FLOW (@inlet air temp, 14.7 psia)	(WET)	(4)(5)	ft3/min	6252	6252	4738	3221
AIR FLOW	(WET)	(4)(5)	lb/hr	27723	27723	21010	14283
FUEL FLOW (60°F, 14.7 psia)			scfm	315	315	244	174
INLET MANIFOLD PRESSURE		(6)	in Hg(abs)	104.4	104.4	78.9	55.1
EXHAUST TEMPERATURE - ENGINE OUTLET		(7)	°F	833	833	876	941
EXHAUST GAS FLOW (@engine outlet temp, 14.5 psia)	(WET)	(5)(8)	ft3/min	16088	16088	12616	9016
EXHAUST GAS MASS FLOW	(WET)	(5)(8)	lb/hr	28584	28584	21676	14760
EMISSIONS DATA - ENGINE OUT							
NOx (as NO2)		(9)(10)	g/bhp-hr	0.30	0.30	0.30	0.30
CO		(9)(10)	g/bhp-hr	2.50	2.50	2.50	2.50
THC (mol. wt. of 15.84)		(9)(10)	g/bhp-hr	4.42	4.42	4.69	4.76
NMHC (mol. wt. of 15.84)		(9)(10)	g/bhp-hr	0.41	0.41	0.43	0.44
NMNEHC (VOCs) (mol. wt. of 15.84)		(9)(10)(11)	g/bhp-hr	0.28	0.28	0.29	0.30
HCHO (Formaldehyde)		(9)(10)	g/bhp-hr	0.16	0.16	0.17	0.20
CO2		(9)(10)	g/bhp-hr	426	426	442	471
EXHAUST OXYGEN		(9)(12)	% DRY	11.3	11.3	11.1	10.7
HEAT REJECTION							
HEAT REJ. TO JACKET WATER (JW)		(13)	Btu/min	27698	27698	23042	18866
HEAT REJ. TO ATMOSPHERE		(13)	Btu/min	10994	10994	10961	10310
HEAT REJ. TO LUBE OIL (OC)		(13)	Btu/min	12553	12553	11937	10886
HEAT REJ. TO A/C - STAGE 1 (1AC)		(13)(14)	Btu/min	19561	19561	9599	2375
HEAT REJ. TO A/C - STAGE 2 (2AC)		(13)(14)	Btu/min	7683	7683	4956	2595
COOLING SYSTEM SIZING CRITERIA							
TOTAL JACKET WATER CIRCUIT (JW+1AC)		(14)(15)	Btu/min	51006			
TOTAL STAGE 2 AFTERCOOLER CIRCUIT (OC+2AC)		(14)(15)	Btu/min	23131			

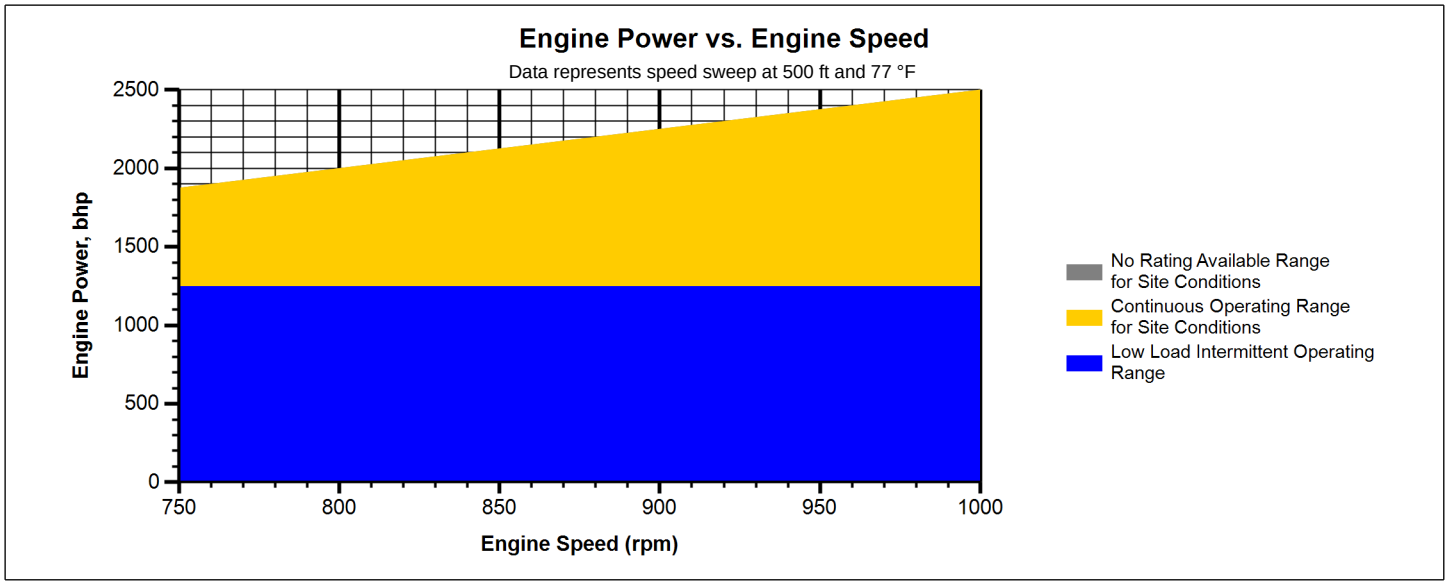
A cooling system safety factor of 0% has been added to the cooling system sizing criteria.

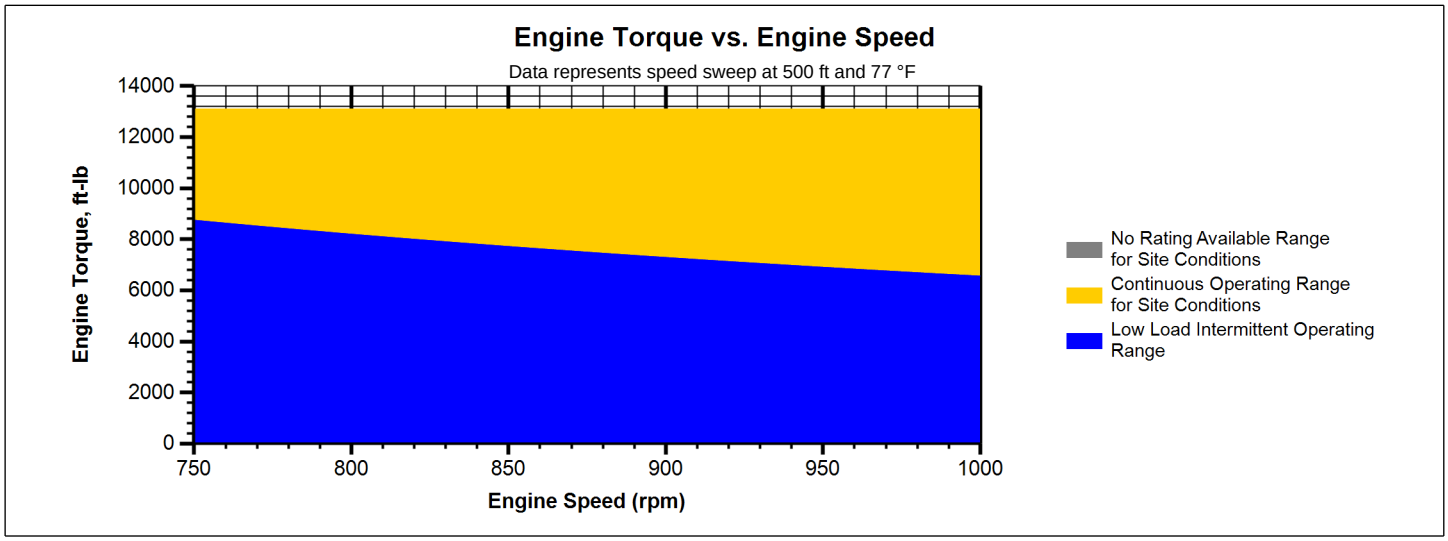
CONDITIONS AND DEFINITIONS

Engine rating obtained and presented in accordance with ISO 3046/1, adjusted for fuel, site altitude and site inlet air temperature. 100% rating at maximum inlet air temperature is the maximum engine capability for the specified fuel at site altitude and maximum site inlet air temperature. Maximum rating is the maximum capability at the specified aftercooler inlet temperature for the specified fuel at site altitude and reduced inlet air temperature. Refer to product O&M manual for details on additional lower load capability. No overload permitted at rating shown.

For notes information consult page three.







Note:
At site conditions of 500 ft and 77°F inlet air temp., constant torque can be maintained down to 750 rpm. The minimum speed for loading at these conditions is 750 rpm.

NOTES:

1. Fuel pressure range specified is to the engine gas shutoff valve (GSOV). Additional fuel train components should be considered in pressure and flow calculations.

2. Engine rating is with two engine driven water pumps. Tolerance is ± 3% of full load.

3. Fuel consumption tolerance is ± 2.5% of full load data.

4. Air flow value is on a 'wet' basis. Flow is a nominal value with a tolerance of ± 5 %.

5. Inlet and Exhaust Restrictions must not exceed A&I limits based on full load flow rates from the standard technical data sheet.

6. Inlet manifold pressure is a nominal value with a tolerance of ± 5 %.

7. Exhaust temperature is a nominal value with a tolerance of (+)63°F, (-)54°F.

8. Exhaust flow value is on a "wet" basis. Flow is a nominal value with a tolerance of ± 6 %.

9. Emissions data is at engine exhaust flange prior to any after treatment.

10. Values listed are higher than nominal levels to allow for instrumentation, measurement, and engine-to-engine variations. They indicate the maximum values expected under steady state conditions. Fuel methane number cannot vary more than ± 3. THC, NMHC, and NMNEHC do not include aldehydes. An oxidation catalyst may be required to meet Federal, State or local CO or HC requirements.

11. VOCs - Volatile organic compounds as defined in US EPA 40 CFR 60, subpart JJJJ

12. Exhaust Oxygen level is the result of adjusting the engine to operate at the specified NOx level. Tolerance is ± 0.5.

13. Heat rejection values are nominal. Tolerances, based on treated water, are ± 10% for jacket water circuit, ± 50% for radiation, ± 20% for lube oil circuit, and ± 5% for aftercooler circuit.

14. Aftercooler heat rejection includes an aftercooler heat rejection factor for the site elevation and inlet air temperature specified. Aftercooler heat rejection values at part load are for reference only. Do not use part load data for heat exchanger sizing.

15. Cooling system sizing criteria are maximum circuit heat rejection for the site, with applied tolerances.

GAS ENGINE SITE SPECIFIC TECHNICAL DATA
Cat 3608 A4 2,500-hp

Constituent	Abbrev	Mole %	Norm
Water Vapor	H2O	0.0000	0.0000
Methane	CH4	92.2700	92.2700
Ethane	C2H6	2.5000	2.5000
Propane	C3H8	0.5000	0.5000
Isobutane	iso-C4H10	0.0000	0.0000
Norbutane	nor-C4H10	0.2000	0.2000
Isopentane	iso-C5H12	0.0000	0.0000
Norpentane	nor-C5H12	0.1000	0.1000
Hexane	C6H14	0.0500	0.0500
Heptane	C7H16	0.0000	0.0000
Nitrogen	N2	3.4800	3.4800
Carbon Dioxide	CO2	0.9000	0.9000
Hydrogen Sulfide	H2S	0.0000	0.0000
Carbon Monoxide	CO	0.0000	0.0000
Hydrogen	H2	0.0000	0.0000
Oxygen	O2	0.0000	0.0000
Helium	HE	0.0000	0.0000
Neopentane	neo-C5H12	0.0000	0.0000
Octane	C8H18	0.0000	0.0000
Nonane	C9H20	0.0000	0.0000
Ethylene	C2H4	0.0000	0.0000
Propylene	C3H6	0.0000	0.0000
TOTAL (Volume %)		100.0000	100.0000

Fuel Makeup:	Nat Gas
Unit of Measure:	English

Calculated Fuel Properties

Caterpillar Methane Number:	84.7
Lower Heating Value (Btu/scf):	905
Higher Heating Value (Btu/scf):	1004
WOBBE Index (Btu/scf):	1168
THC: Free Inert Ratio:	21.83
Total % Inerts (% N2, CO2, He):	4.38%
RPC (%) (To 905 Btu/scf Fuel):	100%
Compressibility Factor:	0.998
Stoich A/F Ratio (Vol/Vol):	9.45
Stoich A/F Ratio (Mass/Mass):	15.75
Specific Gravity (Relative to Air):	0.600
Fuel Specific Heat Ratio (K):	1.313

CONDITIONS AND DEFINITIONS

Caterpillar Methane Number represents the knock resistance of a gaseous fuel. It should be used with the Caterpillar Fuel Usage Guide for the engine and rating to determine the rating for the fuel specified. A Fuel Usage Guide for each rating is included on page 2 of its standard technical data sheet.

RPC always applies to naturally aspirated (NA) engines, and turbocharged (TA or LE) engines only when they are derated for altitude and ambient site conditions.

Project specific technical data sheets generated by the Caterpillar Gas Engine Rating Pro program take the Caterpillar Methane Number and RPC into account when generating a site rating.

Fuel properties for Btu/scf calculations are at 60F and 14.696 psia.

Caterpillar shall have no liability in law or equity, for damages, consequently or otherwise, arising from use of program and related material or any part thereof.

FUEL LIQUIDS

Field gases, well head gases, and associated gases typically contain liquid water and heavy hydrocarbons entrained in the gas. To prevent detonation and severe damage to the engine, hydrocarbon liquids must not be allowed to enter the engine fuel system. To remove liquids, a liquid separator and coalescing filter are recommended, with an automatic drain and collection tank to prevent contamination of the ground in accordance with local codes and standards.

To avoid water condensation in the engine or fuel lines, limit the relative humidity of water in the fuel to 80% at the minimum fuel operating temperature.

ICE Catalyst Sizing Program

ENGINE INPUT (Manufacturer, Model, Type) - Caterpillar G3612 A4 Caterpillar G3612 A4 3750 BHP @ 1000 RPM - EXPERT MODE

Input Mass Flow Rate

	lbs/hr	"scfm"	"scfh"	"acfm"	"acfh"
lb/hr(Estimated):	44,538	9,728	583,700	23797	1,427,820
Brake Horse Power:	3750				
			Maximum Pressure Drop (in)		
Molecular weight:	28.50		0.031	Exhaust Density (lbs/ft3)	
			mol% propane in fuel gas:		<5

Estimated Exhaust Gas Composition

N2	74.5	vol%
O2	10	vol%
H2O	10	vol%
CO2	6	vol%

Inlet Temperature

Process Temperature (F): 812

Enter permitted grams per brake horse power hour (g/bhp-hr)

NOx**	CO**	VOC(NMNE)**	H2CO**
0.3	0.3	0.25	0.03

Catalyst Type

CO/DOC Catalyst

Catalyst Module Details

Module Shape		Module/Layer	6	Layers	1
Square				cpsi	300
Guard Bed - No	X&Y (inch)	15.44	24.75	Depth	3.5

Part Number MCC-7140-2

Open area for gas flow (ft2):	14.29
Linear Velocity(ft/min):	1,665
Foil thickness (inches):	0.002

Calculated Space Velocity: 140,050

Safety Value: 2

Pressure Drop

300	2.77

Inlet Pollutants

	g/bhp-hr	lb/hr	tons/year	ppmv	ppmvd%O2*
NOx	0.30	2.48	10.86	35.01	21.06
CO	2.95	24.39	106.82	565.56	340.14
VOC	0.73	6.04	26.43	88.86	53.44
H2CO	0.19	1.57	6.88	34.00	20.45

Target Conversions

NOx	0.0%
CO	89.8%
VOC(NMNE)	65.8%
H2CO	84.2%

Required Output Pollutants

	g/bhp-hr	lb/hr	tons/year	ppmv	ppmvd%O2*
NOx	0.3	2.48	10.86	35.01	21.06
CO	0.3	2.48	10.86	57.51	34.59
VOC	0.25	2.07	9.05	30.43	18.30
H2CO	0.03	0.25	1.09	5.37	3.23

Conversions Catalyst Design

NOx	0.0%
CO	89.8%
VOC(NMNE)	65.8%
H2CO	84.2%

Output Pollutants with Catalyst Sizing

	g/bhp-hr	lb/hr	tons/year	ppmv	ppmvd%O2*
NOx	0.3	2.48	10.86	35.01	21.06
CO	0.3	2.48	10.86	57.51	34.59
VOC	0.25	2.07	9.05	30.43	18.30
H2CO	0.03	0.25	1.09	5.37	3.23

Notes:

Customer:	Enlink Midstream			Project:	G3612A4
Sales Person:	KW	Date:	4/10/2019	Contact:	Travis Burke
Housing:		Element:	MCC-7140-2	Description:	Element, Catalyst, Oxidation, 15.44 x 24.75

G3612

GAS ENGINE SITE SPECIFIC TECHNICAL DATA
3,750-hp Cat 3612 A4

CATERPILLAR®

GAS COMPRESSION APPLICATION	
ENGINE SPEED (rpm):	1000
COMPRESSION RATIO:	7.6
AFTERCOOLER TYPE:	SCAC
AFTERCOOLER - STAGE 2 INLET (°F):	130
AFTERCOOLER - STAGE 1 INLET (°F):	174
JACKET WATER OUTLET (°F):	190
ASPIRATION:	TA
COOLING SYSTEM:	JW+1AC, OC+2AC
CONTROL SYSTEM:	ADEM4
EXHAUST MANIFOLD:	DRY
COMBUSTION:	LOW EMISSION
NOx EMISSION LEVEL (g/bhp-hr NOx):	0.3
SET POINT TIMING:	18

RATING STRATEGY:	STANDARD
RATING LEVEL:	CONTINUOUS
FUEL SYSTEM:	GAV WITH AIR FUEL RATIO CONTROL
SITE CONDITIONS:	
FUEL:	Nat Gas
FUEL PRESSURE RANGE(psig): (See note 1)	58.0-70.3
FUEL METHANE NUMBER:	84.7
FUEL LHV (Btu/scf):	905
ALTITUDE(ft):	500
INLET AIR TEMPERATURE(°F):	77
STANDARD RATED POWER:	3750 bhp@1000rpm

				MAXIMUM RATING	SITE RATING AT MAXIMUM INLET AIR TEMPERATURE		
RATING		**NOTES**	**LOAD**	**100%**	**100%**	**75%**	**50%**
ENGINE POWER	(WITHOUT FAN)	(2)	bhp	3750	3750	2813	1875
INLET AIR TEMPERATURE			°F	77	77	77	77
ENGINE DATA							
FUEL CONSUMPTION (LHV)		(3)	Btu/bhp-hr	6800	6800	7003	7465
FUEL CONSUMPTION (HHV)		(3)	Btu/bhp-hr	7543	7543	7768	8280
AIR FLOW (@inlet air temp, 14.7 psia)	(WET)	(4)(5)	ft3/min	9251	9251	7013	4802
AIR FLOW	(WET)	(4)(5)	lb/hr	41017	41017	31095	21293
FUEL FLOW (60°F, 14.7 psia)			scfm	470	470	363	258
INLET MANIFOLD PRESSURE		(6)	in Hg(abs)	99.2	99.2	75.7	53.1
EXHAUST TEMPERATURE - ENGINE OUTLET		(7)	°F	840	840	894	957
EXHAUST GAS FLOW (@engine outlet temp, 14.5 psia)	(WET)	(5)(8)	ft3/min	23936	23936	18904	13581
EXHAUST GAS MASS FLOW	(WET)	(5)(8)	lb/hr	42304	42304	32089	21999
EMISSIONS DATA - ENGINE OUT							
NOx (as NO2)		(9)(10)	g/bhp-hr	0.30	0.30	0.30	0.30
CO		(9)(10)	g/bhp-hr	2.50	2.50	2.50	2.50
THC (mol. wt. of 15.84)		(9)(10)	g/bhp-hr	4.49	4.49	4.65	4.67
NMHC (mol. wt. of 15.84)		(9)(10)	g/bhp-hr	0.42	0.42	0.43	0.43
NMNEHC (VOCs) (mol. wt. of 15.84)		(9)(10)(11)	g/bhp-hr	0.28	0.28	0.29	0.29
HCHO (Formaldehyde)		(9)(10)	g/bhp-hr	0.19	0.19	0.19	0.21
CO2		(9)(10)	g/bhp-hr	423	423	438	468
EXHAUST OXYGEN		(9)(12)	% DRY	11.5	11.5	11.3	10.9
HEAT REJECTION							
HEAT REJ. TO JACKET WATER (JW)		(13)	Btu/min	40888	40888	32639	27887
HEAT REJ. TO ATMOSPHERE		(13)	Btu/min	17674	17674	16883	13955
HEAT REJ. TO LUBE OIL (OC)		(13)	Btu/min	18701	18701	17070	15164
HEAT REJ. TO A/C - STAGE 1 (1AC)		(13)(14)	Btu/min	30425	30425	14447	2708
HEAT REJ. TO A/C - STAGE 2 (2AC)		(13)(14)	Btu/min	7352	7352	5372	3527
COOLING SYSTEM SIZING CRITERIA							
TOTAL JACKET WATER CIRCUIT (JW+1AC)		(14)(15)	Btu/min	76923			
TOTAL STAGE 2 AFTERCOOLER CIRCUIT (OC+2AC)		(14)(15)	Btu/min	30160			

A cooling system safety factor of 0% has been added to the cooling system sizing criteria.

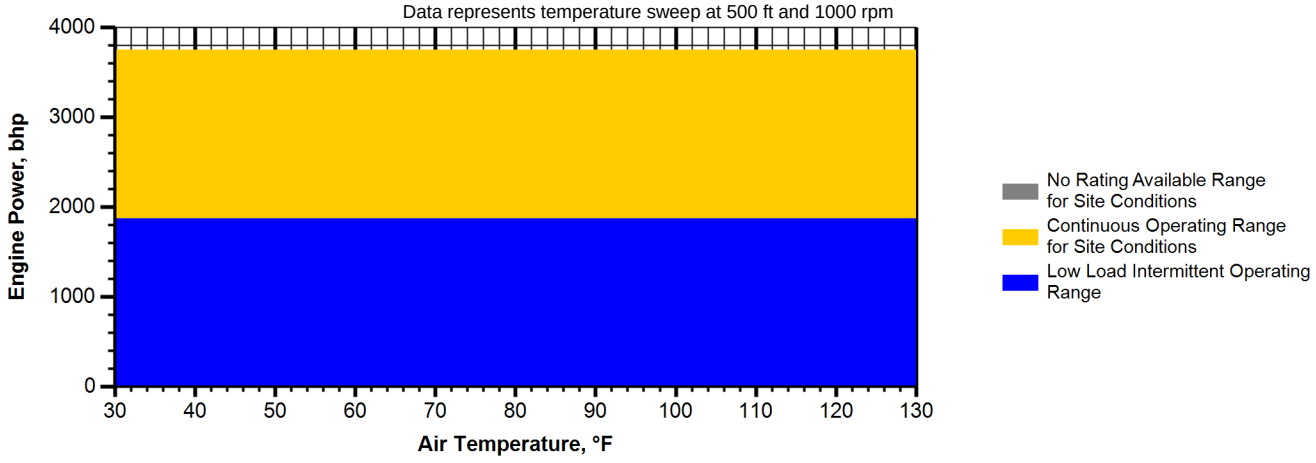
CONDITIONS AND DEFINITIONS

Engine rating obtained and presented in accordance with ISO 3046/1, adjusted for fuel, site altitude and site inlet air temperature. 100% rating at maximum inlet air temperature is the maximum engine capability for the specified fuel at site altitude and maximum site inlet air temperature. Maximum rating is the maximum capability at the specified aftercooler inlet temperature for the specified fuel at site altitude and reduced inlet air temperature. Refer to product O&M manual for details on additional lower load capability. No overload permitted at rating shown.

For notes information consult page three.

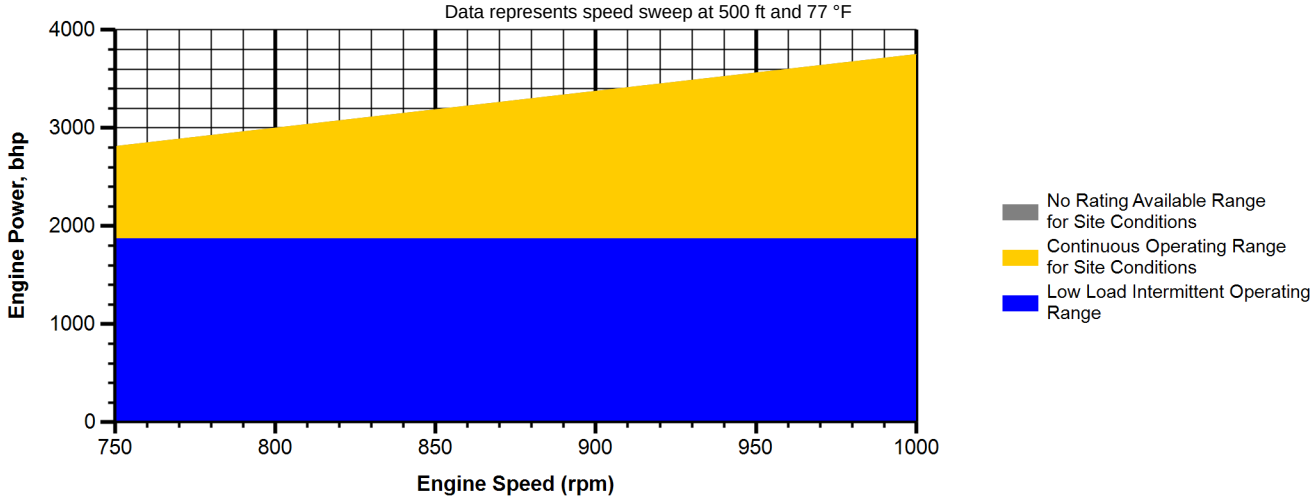
Engine Power vs. Inlet Air Temperature

Data represents temperature sweep at 500 ft and 1000 rpm



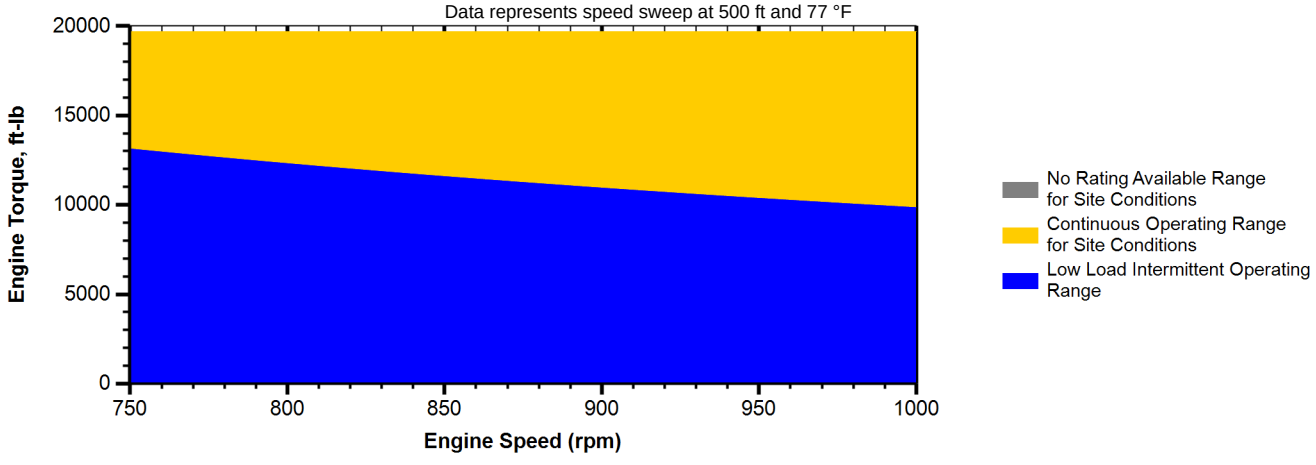
Engine Power vs. Engine Speed

Data represents speed sweep at 500 ft and 77 °F



Engine Torque vs. Engine Speed

Data represents speed sweep at 500 ft and 77 °F



Note:
At site conditions of 500 ft and 77°F inlet air temp., constant torque can be maintained down to 750 rpm. The minimum speed for loading at these conditions is 750 rpm.

NOTES:

1. Fuel pressure range specified is to the engine gas shutoff valve (GSOV). Additional fuel train components should be considered in pressure and flow calculations.

2. Engine rating is with two engine driven water pumps. Tolerance is ± 3% of full load.

3. Fuel consumption tolerance is ± 2.5% of full load data.

4. Air flow value is on a 'wet' basis. Flow is a nominal value with a tolerance of ± 5 %.

5. Inlet and Exhaust Restrictions must not exceed A&I limits based on full load flow rates from the standard technical data sheet.

6. Inlet manifold pressure is a nominal value with a tolerance of ± 5 %.

7. Exhaust temperature is a nominal value with a tolerance of (+)63°F, (-)54°F.

8. Exhaust flow value is on a "wet" basis. Flow is a nominal value with a tolerance of ± 6 %.

9. Emissions data is at engine exhaust flange prior to any after treatment.

10. Values listed are higher than nominal levels to allow for instrumentation, measurement, and engine-to-engine variations. They indicate the maximum values expected under steady state conditions. Fuel methane number cannot vary more than ± 3. THC, NMHC, and NMNEHC do not include aldehydes. An oxidation catalyst may be required to meet Federal, State or local CO or HC requirements.

11. VOCs - Volatile organic compounds as defined in US EPA 40 CFR 60, subpart JJJJ

12. Exhaust Oxygen level is the result of adjusting the engine to operate at the specified NOx level. Tolerance is ± 0.5.

13. Heat rejection values are nominal. Tolerances, based on treated water, are ± 10% for jacket water circuit, ± 50% for radiation, ± 20% for lube oil circuit, and ± 5% for aftercooler circuit.

14. Aftercooler heat rejection includes an aftercooler heat rejection factor for the site elevation and inlet air temperature specified. Aftercooler heat rejection values at part load are for reference only. Do not use part load data for heat exchanger sizing.

15. Cooling system sizing criteria are maximum circuit heat rejection for the site, with applied tolerances.

GAS ENGINE SITE SPECIFIC TECHNICAL DATA
3,750-hp Cat 3612 A4

Constituent	Abbrev	Mole %	Norm
Water Vapor	H2O	0.0000	0.0000
Methane	CH4	92.2700	92.2700
Ethane	C2H6	2.5000	2.5000
Propane	C3H8	0.5000	0.5000
Isobutane	iso-C4H10	0.0000	0.0000
Norbutane	nor-C4H10	0.2000	0.2000
Isopentane	iso-C5H12	0.0000	0.0000
Norpentane	nor-C5H12	0.1000	0.1000
Hexane	C6H14	0.0500	0.0500
Heptane	C7H16	0.0000	0.0000
Nitrogen	N2	3.4800	3.4800
Carbon Dioxide	CO2	0.9000	0.9000
Hydrogen Sulfide	H2S	0.0000	0.0000
Carbon Monoxide	CO	0.0000	0.0000
Hydrogen	H2	0.0000	0.0000
Oxygen	O2	0.0000	0.0000
Helium	HE	0.0000	0.0000
Neopentane	neo-C5H12	0.0000	0.0000
Octane	C8H18	0.0000	0.0000
Nonane	C9H20	0.0000	0.0000
Ethylene	C2H4	0.0000	0.0000
Propylene	C3H6	0.0000	0.0000
TOTAL (Volume %)		100.0000	100.0000

Fuel Makeup:	Nat Gas
Unit of Measure:	English

Calculated Fuel Properties

Caterpillar Methane Number:	84.7
Lower Heating Value (Btu/scf):	905
Higher Heating Value (Btu/scf):	1004
WOBBE Index (Btu/scf):	1168
THC: Free Inert Ratio:	21.83
Total % Inerts (% N2, CO2, He):	4.38%
RPC (%) (To 905 Btu/scf Fuel):	100%
Compressibility Factor:	0.998
Stoich A/F Ratio (Vol/Vol):	9.45
Stoich A/F Ratio (Mass/Mass):	15.75
Specific Gravity (Relative to Air):	0.600
Fuel Specific Heat Ratio (K):	1.313

CONDITIONS AND DEFINITIONS

Caterpillar Methane Number represents the knock resistance of a gaseous fuel. It should be used with the Caterpillar Fuel Usage Guide for the engine and rating to determine the rating for the fuel specified. A Fuel Usage Guide for each rating is included on page 2 of its standard technical data sheet.

RPC always applies to naturally aspirated (NA) engines, and turbocharged (TA or LE) engines only when they are derated for altitude and ambient site conditions.

Project specific technical data sheets generated by the Caterpillar Gas Engine Rating Pro program take the Caterpillar Methane Number and RPC into account when generating a site rating.

Fuel properties for Btu/scf calculations are at 60F and 14.696 psia.

Caterpillar shall have no liability in law or equity, for damages, consequently or otherwise, arising from use of program and related material or any part thereof.

FUEL LIQUIDS

Field gases, well head gases, and associated gases typically contain liquid water and heavy hydrocarbons entrained in the gas. To prevent detonation and severe damage to the engine, hydrocarbon liquids must not be allowed to enter the engine fuel system. To remove liquids, a liquid separator and coalescing filter are recommended, with an automatic drain and collection tank to prevent contamination of the ground in accordance with local codes and standards.

To avoid water condensation in the engine or fuel lines, limit the relative humidity of water in the fuel to 80% at the minimum fuel operating temperature.

September 26, 2016

Emission Control Application Data Sheet

Maxim Silencers
10635 Brighton Lane
Stafford, Texas 77477
Phone: 832 554-0980
Fax: 832 554-0990

Customer: **AG EQUIPMENT** Project: **ENLINK** Date: **4/26/2019**

Customer Contact Powertherm Contact: Order/Quote #: **0**

Engine Data:

Engine Model:	**WAUK 12V275GL+**		Speed:	**1000**	RPM
Fuel & Operating Type:	**Natural Gas Lean Burn**		Engine Power:	**3750**	Hp
				2704	KW
Exhaust Flow Rate:	**25925**	**acfm**	Exhaust Temperature:	**836**	°F
	44047	**m^3/hr**		**447**	°C
	47529	**lbs/hr**			

Catalyst Data:

Number of Core layers:	**1**				
Model:	**MCC3-G8-3428-C3**		Inlet Size:	**28**	in
Grade:	**Critical**		Outlet Size:	**34**	in
Body Diameter:	**68**	in	Body Length:	**303**	in
Estimated weight:	**6598**	lbs	Estimated Back Pressure of the unit:	**4.88**	in of WC
	2994	Kg		**12.1**	mbar
Core Part Number:	**MCC-7140-2 (15.44 X 24.75) SIZE** Qty **6**		Speed through inlet:	**4235**	ft/min
Cell Density	300	cpsi	Back Pressure across Element(s) only	2.72	in of WC
				6.8	mbar

Emission:

Min. Temp. at Core Face: **752** °F **400** °C
Max. Temp. at Core Face: **763** °F **406** °C

Catalyst Type: **Oxidation**

O_2 in Exhaust vol %
H_2O in Exhaust vol %

	Pollutant					
	NOx	CO	NMNEHC/VOC	CH_2O/CHCO	ORGANIC PM10	
Engine Out / Pre Emission:	**0.3**	**2.4**	**0.504**	**0.05**	**0**	g/bhp-hr
	67.28	**538.22**	**113.03**	**11.21**	**0.00**	mg/Nm3
Post Emission:	**0.300**	**0.168**	**0.252**	**0.010**	**0.000**	g/bhp-hr
	67.28	**37.68**	**56.51**	**2.24**	**0.00**	mg/Nm3
	0.0	***93.0***	***50.0***	***80.0***	***50.0***	% Reduction
	2.48	1.39	2.08	0.08		lb/hr
	10.86	6.08	9.13	0.36		tons/year operation **8760** hr/year
	32.3	18.1	27.1	1.1		ppmv
						ppmvd @ 15% O2

Acoustics:

Frequency Band (Hz):	31.5	63	125	250	500	1000	2000	4000	8000	
Raw Noise SPL (dB) at 3.28 ft.:	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	7 dBA
Estimated Attenuation (dB):	**24**	**35**	**37**	**31**	**28**	**24**	**25**	**29.5**	**30**	No Element
Plus:	**24**	**36**	**39**	**33**	**32**	**29**	**31**	**35.5**	**35**	One Element Layer
Silenced SPL (dB) at 3.28 ft.:	**-24**	**-36**	**-39**	**-33**	**-32**	**-29**	**-31**	**-35.5**	**-35**	-24.8 dBA

Warranty & Notes:

- **If Pre-Emission levels are not as noted above, contact Maxim Silencers for a re-quote.**
- To achieve Post Emissions levels detailed above, exhaust temperature and Pre-Emission data must be as specified.
- Maximum allowable exhaust temperature at core face is 1350°F.
- If applicable, the engine will require an air/fuel ratio controller to meet above emission levels. For Rich Burn engines λ must be 0.96 - 0.99.
- Catalyst cleaning/regeneration required, if initial backpressure increases by 2" of WC.
- Engine operation to be stable and reproducible.
- QAC is not designed to withstand a backfire, therefore measures should be taken prior to QAC unit to alleviate backfire pressure.
- Maximum lubrication oil consumption rate to be less than 0.0015 lb/bhp/hr.
- Lube oil sulfate ash contents should not exceed 0.5%.
- Phosphorus and/or Zinc should not exceed 5 ppmv in the exhaust stream.
- A high temperature alarm/shutdown to be maintained at downstream of catalyst at 1300°F.
- Fuel not to contain heavy or transition metals such as Pb, Ar, Zn, Cu, Sn, Fe, Ba, Ni, Cr etc.
- Chlorinated or Silicone containing compounds in the exhaust not to exceed 1 ppmv.
- Sulfur compounds in the exhaust gas stream not to exceed 25 ppmv.
- Performance guarantee is voided should the catalyst become masked or de-activated by any contaminant in the exhaust stream.
- Engine to be maintained and operated in accordance within manufacturer's recommended practice.
- Under no condition will Maxim Silencers assume any contingent liabilities.
- Operating manual is available online at www.maximsilencers.com or contact a Maxim sales representative.
- Nomenclature: QAC4-292-8, 4 is grade (Super Critical), 29 is catalyst block size, 2 is no. of catalyst(s) and 8 is flange diameter.
- Organic PM10 are estimate only and not a guarantee because of the variability in fuels and additives which change PM10.
- Maxim Silencers standard one year warranty applies.

Rev level: 86

275GL Series 12V 275GL+ Fuel Flex

Gas Engine with ESM*2

Constant Torque Ratings

3,750 bhp (2,796 kWb) @ 1,000 rpm

Technical Data

Cylinders	12V
Piston displacement	13,048 cu. in. (214 L)
Compression ratio	8:1
Bore & stroke	10.83" x 11.81" (275 x 300 mm)
Jacket water system capacity	100 gal. (379 L)
Lube oil capacity	220 gal. (883 L)
Fuel pressure range	50 – 60 psi (3.4 – 4.1 bar)
Starting system	150 psi (10.3 bar)

Dimensions l x w x h inch (mm)
188.8 (4,796) x 91.3 (2,320) x 126.4 (3,211)

Weights lb (kg)
54,000 (24,493)

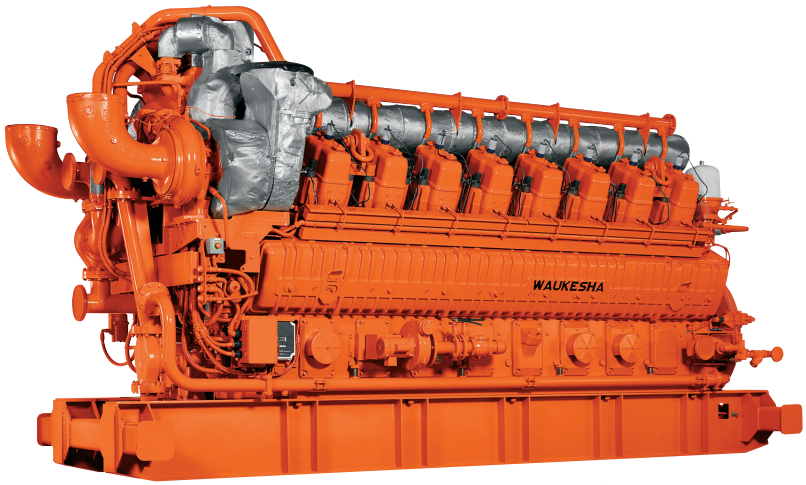


Image is representative of engine model.

INNIO's Waukesha 275GL+ represents the most advanced generation of high-horsepower engines designed for optimum performance in gas compression and other mechanical drive applications. A unique combination of robust construction and innovative technology, the 275GL+ lean-burn engine delivers the fuel flexibility, reliability, power output, and emissions demanded by the oil and gas industry.

The 275GL+ features Waukesha's ESM2 control, which integrates engine functionality into a single, closed-loop system with direct NOx measurement.

Key components such as the oil filters, oil cooler, pre-lube pump, and jacket water and auxiliary thermostats have been mounted on the engine, simplifying the packaging process and skid layout.

Technical Features

Feature	Description	Advantages
Excellent fuel efficiency	Optimized to achieve excellent fuel efficiency while running on a wide variety of field gases and load profiles.	Minimize fuel costs and maximize profits across the entire range of speed and load combinations.
Single, closed-loop engine control system	Waukesha's proven ESM2 control integrates the following into a single, closed-loop system: • Air/Fuel Ratio Control • Wastegate Control • Turbocharger Bypass Control • Ignition Timing • Knock Detection • Fault Monitoring	Directly measures NOx emissions and automatically adjusts operating parameters to maintain desired NOx setting.
Wide range of fuel flexibility	Operation on a broad range of fuels with full power from 850-1,550 BTU/ft³ and capability up to 2,300 BTU/ft³.	More power on more fuels means more profits without the additional costs associated with fuel treatment skids.
High reliability with long maintenance intervals	Achieves up to 36,000 hours before top-end overhaul and 72,000 hours before bottom end.	With low lifecycle costs and the ability to run up to 5 years continuously before overhaul, the 275GL+ is the best choice for the most remote, rugged, and demanding applications.

Performance Data

Intercooler Water Temperature 130°F (54°C)		1000 RPM	
		0.3 NOx	0.5 NOx
	Power bhp (kWb)	3,750 (2,796)	
	BSFC (LHV) Btu/bhp-hr (kJ/kWh)	6,805 (10,225)	6,665 (10,014)
	WKI* (before derate)	50	50
	Altitude (before derate) ft (m)	4,900 (1,493)	5,700 (1,737)
Emissions	NOx g/bhp-hr (mg/Nm³ @ 5% O_2)	0.3 (121)	0.5 (202)
Emissions	CO g/bhp-hr (mg/Nm³ @ 5% O_2)	1.99 (806)	1.57 (636)
Emissions	NMHC g/bhp-hr (mg/Nm³ @ 5% 0_2)	0.32 (131)	0.80 (326)
Emissions	THC g/bhp-hr (mg/Nm³ @ 5% O_2)	5.14 (2,080)	4.37 (1,780)
Emissions	Methane g/bhp-hr (mg/Nm³ @ 5% O_2)	4.27 (1,730)	3.56 (1,445)

All information provided is subject to change without notice. All technical and performance data to be released via SAA - please contact Application Engineering.

Consult your local Waukesha representative for system application assistance. The manufacturer reserves the right to change or modify without notice, the design or equipment specifications as herein set forth without incurring any obligation either with respect to equipment previously sold or in the process of construction except where otherwise specifically guaranteed by the manufacturer.

INNIO* is a leading solutions provider of gas engines, power equipment, a digital platform and related services for power generation and gas compression at or near the point of use. With our Jenbacher* and Waukesha* product brands, INNIO pushes beyond the possible and looks boldly toward tomorrow. Our diverse portfolio of reliable, economical and sustainable industrial gas engines generates 200 kW to 10 MW of power for numerous industries globally. We can provide life cycle support to the more than 48,000 delivered gas engines worldwide. And, backed by our service network in more than 100 countries, INNIO connects with you locally for rapid response to your service needs. Headquartered in Jenbach, Austria, the business also has primary operations in Welland, Ontario, Canada, and Waukesha, Wisconsin, US.

Find your local support online:
www.innio.com/en/company/providers

IWK-119017-EN

*Indicates a trademark
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Generator Gas

400kW Rich Burn Gas data sheet

Document No: G08000870
Revision: B
Created By: C. McGregor
Approved By: A. Blackford
Approval Date: 15/09/2022

Model

Model reference	GG0400GASCON
Model size and rating	400 kVA
Bill of Material reference number	611039 B

Manufacturer

Model Reference	NHC20 H24SE - EPA CGT

Performance Data

Maximum Ambient Before Derate (LTA)	41.0°C (105.8°F) COP

Electrical (ISO 8528-1) *

Continuous Power (COP)	kW (kVA)	359.0	(448.75)
LPG Continuous Power (COP)	kW (kVA)	255.0	(318.75)
Prime Power (PRP)	kW (kVA)	394.0	(492.5)
Single Step Load Application		44%	
Max Parasitic Load		17kW	

Gas Energy Input - LHV (ISO 3046-1) **

100% KW PRP	1296kW
100% KW COP	1181kW

Alternator

Class F Temp Rise (105°C) Three Phase	kW (kVA)	540.0	(675)
Ends Out		12	
Make & Type		HCI534 E13 or S5L1S-E4	
AVR		MX341	
Regulation		/- 1	
Number of Bearings		1	

Circuit Breaker

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Make & Model		Schneider NS100N
Number of Poles		3
Rating	Amp (Amp)	1000.0 (1000)
Trip Unit Type		Micrologic 6.0
Overload Protection Range		400-1000 Amps (Adjustable by selector)
Short Circuit Protection Range		1500-10000 Amps (Adjustable by selector)

Load Terminals

Type	Busbar M12

Engine

Make & Type	Waukesha VGF H24SE-EPA
Cylinders & Form	8 In-Line
Aspiration	Turbocharged Intercooled
Governor Make & Type	Electronic
Steady State Frequency	/- 1% (/-0.6Hz)
Battery Voltage	24V

Generator Gas Supply Pressures

Allowable Gas Supply Pressure (Natural Gas)	10 - 100 psi
Allowable Gas Supply Pressure (LPG)	30 - 300 psi

Engine Gas Supply Pressures

Allowable Gas Supply Pressure (Natural Gas)	1.5 - 5 psi

Exhaust Emissions

Specific Load	75% - 100%
Stationary Part 1048 HC NOx g/kW-hr	0.8 g/kW-hr
Stationary Part 1048 CO g/kW-hr	20.6 g/kW-hr

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Stationary Part 1048 NMHC NOx g/kW-hr	0.8 g/kW-hr
Mobile Part 1048 HC NOx g/kW-hr	1.3 g/kW-hr
Mobile Part 1048 CO g/kW-hr	11.1 g/kW-hr
Mobile Part 1048 NMHC NOx g/kW-hr	1.3 g/kW-hr
Part 60 Subpart JJJJ Table 1 NOx g/Hp-hr	1.0 g/HP-hr
Part 60 Subpart JJJJ Table 1 VOC g/Hp-hr	0.7 g/HP-hr
Part 60 Subpart JJJJ Table 1 CO g/Hp-hr	2.0 g/HP-hr
Fuel	LPG/Propane or Natural Gas (CNG/LNG)

Exhaust Silencer

Make & Type	DCL International 2-DC18-8 CRIT GR CATALYTIC SILENCER (PN: D304-01-1Y18-32)
Certificate Number	JDRSB24.0VGF-002
Permissible Back Pressure	28 (1.1) mm (in) Hg
Current back pressure	17 (0.67) mm (in) Hg

Noise

Sound Pressure at 1m/3ft	81.4 dBA
Sound Pressure at 7m/21ft	71.7 dBA

Gas Supply

Minimum Methane Index	33.0

Other Capacities and Dimensions

Lube Oil Capacity - Total	L (US gal)	338.0	(89.232)
Lube Oil Capacity Sump	L (US gal)	212.8	(56.179)
Lube Oil Capacity Additional Oil Top Up	L (US gal)	125.0	(33)
Coolant Capacity	L (US gal)	300.0	(79.2)

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Generator Gas

400kW Rich Burn Gas data sheet

Physical Characteristics

Length	6.06 m	19.88 ft
Width	2.44 m	8 ft
Height	2.62 m	8.6 ft
Gross Weight	13870 kg	30578.11 lbs
Net Weight	13430 kg	29608.08 lbs
Gross Fuel	0 lit	0 US gal
Net Fuel	0 lit	0 US gal

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Cimarron's product and service offering has greatly expanded following the recent acquisitions of HY-BON and Aereon and their associated brands of products:

Products and Services

Emissions Control	Oil and Gas Processing	Services
Vapor Recovery Units: • Compression-base: Screw, Vane Compressors, Plunger Lift Pumps • Activated Carbon-based Vapor Recovery Systems **Enclosed Combustion:** • Quad O Combustors (98% DRE), Thermal Oxidizers, Vapor Combustion Units (99.9% DRE), CEB™ (99.99% DRE, low NOx) **Smokeless Flares:** • High Efficiency Assisted (air, steam, gas), Utility, Derrick, Ground Flares, DreamDuo. ABUTEC A CIMARRON BRAND AEREON A CIMARRON COMPANY JORDAN TECHNOLOGIES A CIMARRON COMPANY FLARE INDUSTRIES A CIMARRON COMPANY HY-BON EDI A CIMARRON COMPANY	**Production and processing:** • Modular Production Packages • Separator • Gas Filtration • Glycol Dehydration • Gas Production Units • Oil and Gas Heaters • Heater Treaters • Vapor Recovery Towers • BTEX Eliminators • Plunger Lift Pumps • API Tanks CIMARRON CREATING A CLEANER ENVIRONMENT™	**Field Services:** • Startup & Maintenance • Spare parts • Lease/Rentals • LDAR Detection **Automation:** • Burner Management Systems • Emissions Control Real-time Monitoring • DRE optimization (DRE-Max™) ARCONTROL™ DRE MAX™ Sytelink 360™

Segments and Applications

Oil & Gas Focus Areas	Expanded Focus Areas for Combustion Applications
Upstream: • Wellhead Oil and Gas Handling Production equipment to include separator packages, heater treaters, gas production units (GPUs), Line Heaters, Tanks, Tank Vapor Combustors, Flares, Mechanical Vapor Recovery **Midstream:** • Gas Processing applications to include gas dehydration, gas filtration, gas line heaters, flares combustion, BTEX Eliminators **Downstream:** • Loading Terminal Vapor Combustors, Carbon Vapor Recovery, Refinery spec Flares & Combustors	• Biogas • Agricultural • Landfill • Wastewater Treatment • Coal Mines • Industrial • Aerospace

Table 3.2-2. UNCONTROLLED EMISSION FACTORS FOR 4-STROKE LEAN-BURN ENGINES[a]
(SCC 2-02-002-54)

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
Criteria Pollutants and Greenhouse Gases		
NO_x[c] 90 - 105% Load	4.08 E+00	B
NO_x[c] <90% Load	8.47 E-01	B
CO[c] 90 - 105% Load	3.17 E-01	C
CO[c] <90% Load	5.57 E-01	B
CO_2[d]	1.10 E+02	A
SO_2[e]	5.88 E-04	A
TOC[f]	1.47 E+00	A
Methane[g]	1.25 E+00	C
VOC[h]	1.18 E-01	C
PM10 (filterable)[i]	7.71 E-05	D
PM2.5 (filterable)[i]	7.71 E-05	D
PM Condensable[j]	9.91 E-03	D
Trace Organic Compounds		
1,1,2,2-Tetrachloroethane[k]	<4.00 E-05	E
1,1,2-Trichloroethane[k]	<3.18 E-05	E
1,1-Dichloroethane	<2.36 E-05	E
1,2,3-Trimethylbenzene	2.30 E-05	D
1,2,4-Trimethylbenzene	1.43 E-05	C
1,2-Dichloroethane	<2.36 E-05	E
1,2-Dichloropropane	<2.69 E-05	E
1,3,5-Trimethylbenzene	3.38 E-05	D
1,3-Butadiene[k]	2.67E-04	D
1,3-Dichloropropene[k]	<2.64 E-05	E
2-Methylnaphthalene[k]	3.32 E-05	C
2,2,4-Trimethylpentane[k]	2.50 E-04	C
Acenaphthene[k]	1.25 E-06	C

Table 3.2-2. UNCONTROLLED EMISSION FACTORS FOR 4-STROKE LEAN-BURN ENGINES (Continued)

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
Acenaphthylene[k]	5.53 E-06	C
Acetaldehyde[k,l]	8.36 E-03	A
Acrolein[k,l]	5.14 E-03	A
Benzene[k]	4.40 E-04	A
Benzo(b)fluoranthene[k]	1.66 E-07	D
Benzo(e)pyrene[k]	4.15 E-07	D
Benzo(g,h,i)perylene[k]	4.14 E-07	D
Biphenyl[k]	2.12 E-04	D
Butane	5.41 E-04	D
Butyr/Isobutyraldehyde	1.01 E-04	C
Carbon Tetrachloride[k]	<3.67 E-05	E
Chlorobenzene[k]	<3.04 E-05	E
Chloroethane	1.87 E-06	D
Chloroform[k]	<2.85 E-05	E
Chrysene[k]	6.93 E-07	C
Cyclopentane	2.27 E-04	C
Ethane	1.05 E-01	C
Ethylbenzene[k]	3.97 E-05	B
Ethylene Dibromide[k]	<4.43 E-05	E
Fluoranthene[k]	1.11 E-06	C
Fluorene[k]	5.67 E-06	C
Formaldehyde[k,l]	5.28 E-02	A
Methanol[k]	2.50 E-03	B
Methylcyclohexane	1.23 E-03	C
Methylene Chloride[k]	2.00 E-05	C
n-Hexane[k]	1.11 E-03	C
n-Nonane	1.10 E-04	C

Table 3.2-2. UNCONTROLLED EMISSION FACTORS FOR 4-STROKE LEAN-BURN ENGINES
(Continued)

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
n-Octane	3.51 E-04	C
n-Pentane	2.60 E-03	C
Naphthalene[k]	7.44 E-05	C
PAH[k]	2.69 E-05	D
Phenanthrene[k]	1.04 E-05	D
Phenol[k]	2.40 E-05	D
Propane	4.19 E-02	C
Pyrene[k]	1.36 E-06	C
Styrene[k]	<2.36 E-05	E
Tetrachloroethane[k]	2.48 E-06	D
Toluene[k]	4.08 E-04	B
Vinyl Chloride[k]	1.49 E-05	C
Xylene[k]	1.84 E-04	B

[a] Reference 7. Factors represent uncontrolled levels. For NO_x, CO, and PM10, "uncontrolled" means no combustion or add-on controls; however, the factor may include turbocharged units. For all other pollutants, "uncontrolled" means no oxidation control; the data set may include units with control techniques used for NOx control, such as PCC and SCR for lean burn engines, and PSC for rich burn engines. Factors are based on large population of engines. Factors are for engines at all loads, except as indicated. SCC = Source Classification Code. TOC = Total Organic Compounds. PM-10 = Particulate Matter ≤ 10 microns (μm) aerodynamic diameter. A "<" sign in front of a factor means that the corresponding emission factor is based on one-half of the method detection limit.

[b] Emission factors were calculated in units of (lb/MMBtu) based on procedures in EPA Method 19. To convert from (lb/MMBtu) to (lb/10^6 scf), multiply by the heat content of the fuel. If the heat content is not available, use 1020 Btu/scf. To convert from (lb/MMBtu) to (lb/hp-hr) use the following equation:

$$\text{lb/hp-hr} = (\text{lb/MMBtu})\ (\text{heat input, MMBtu/hr})\ (\text{1/operating HP, 1/hp})$$

[c] Emission tests with unreported load conditions were not included in the data set.

[d] Based on 99.5% conversion of the fuel carbon to CO_2. CO_2 [lb/MMBtu] = (3.67)(%CON)(C)(D)(1/h), where %CON = percent conversion of fuel carbon to CO_2, C = carbon content of fuel by weight (0.75), D = density of fuel, 4.1 E+04 lb/10^6 scf, and

h = heating value of natural gas (assume 1020 Btu/scf at 60°F).

[e] Based on 100% conversion of fuel sulfur to SO_2. Assumes sulfur content in natural gas of 2,000 gr/10^6scf.

[f] Emission factor for TOC is based on measured emission levels from 22 source tests.

[g] Emission factor for methane is determined by subtracting the VOC and ethane emission factors from the TOC emission factor. Measured emission factor for methane compares well with the calculated emission factor, 1.31 lb/MMBtu vs. 1.25 lb/MMBtu, respectively.

[h] VOC emission factor is based on the sum of the emission factors for all speciated organic compounds less ethane and methane.

[i] Considered $\leq$ 1 μm in aerodynamic diameter. Therefore, for filterable PM emissions, PM10(filterable) = PM2.5(filterable).

[j] PM Condensable = PM Condensable Inorganic + PM-Condensable Organic

[k] Hazardous Air Pollutant as defined by Section 112(b) of the Clean Air Act.

[l] For lean burn engines, aldehyde emissions quantification using CARB 430 may reflect interference with the sampling compounds due to the nitrogen concentration in the stack. The presented emission factor is based on FTIR measurements. Emissions data based on CARB 430 are available in the background report.

Table 3.2-3. UNCONTROLLED EMISSION FACTORS FOR 4-STROKE RICH-BURN ENGINES[a]
(SCC 2-02-002-53)

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
Criteria Pollutants and Greenhouse Gases		
NO_x[c] 90 - 105% Load	2.21 E+00	A
NO_x[c] <90% Load	2.27 E+00	C
CO[c] 90 - 105% Load	3.72 E+00	A
CO[c] <90% Load	3.51 E+00	C
CO_2[d]	1.10 E+02	A
SO_2[e]	5.88 E-04	A
TOC[f]	3.58 E-01	C
Methane[g]	2.30 E-01	C
VOC[h]	2.96 E-02	C
PM10 (filterable)[i,j]	9.50 E-03	E
PM2.5 (filterable)[j]	9.50 E-03	E
PM Condensable[k]	9.91 E-03	E
Trace Organic Compounds		
1,1,2,2-Tetrachloroethane[l]	2.53 E-05	C
1,1,2-Trichloroethane[l]	<1.53 E-05	E
1,1-Dichloroethane	<1.13 E-05	E
1,2-Dichloroethane	<1.13 E-05	E
1,2-Dichloropropane	<1.30 E-05	E
1,3-Butadiene[l]	6.63 E-04	D
1,3-Dichloropropene[l]	<1.27 E-05	E
Acetaldehyde[l,m]	2.79 E-03	C
Acrolein[l,m]	2.63 E-03	C
Benzene[l]	1.58 E-03	B
Butyr/isobutyraldehyde	4.86 E-05	D
Carbon Tetrachloride[l]	<1.77 E-05	E

Table 3.2-3. UNCONTROLLED EMISSION FACTORS FOR 4-STROKE RICH-BURN ENGINES (Concluded)

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
Chlorobenzene[l]	<1.29 E-05	E
Chloroform[l]	<1.37 E-05	E
Ethane[n]	7.04 E-02	C
Ethylbenzene[l]	<2.48 E-05	E
Ethylene Dibromide[l]	<2.13 E-05	E
Formaldehyde[l,m]	2.05 E-02	A
Methanol[l]	3.06 E-03	D
Methylene Chloride[l]	4.12 E-05	C
Naphthalene[l]	<9.71 E-05	E
PAH[l]	1.41 E-04	D
Styrene[l]	<1.19 E-05	E
Toluene[l]	5.58 E-04	A
Vinyl Chloride[l]	<7.18 E-06	E
Xylene[l]	1.95 E-04	A

[a] Reference 7. Factors represent uncontrolled levels. For NO_x, CO, and PM-10, "uncontrolled" means no combustion or add-on controls; however, the factor may include turbocharged units. For all other pollutants, "uncontrolled" means no oxidation control; the data set may include units with control techniques used for NOx control, such as PCC and SCR for lean burn engines, and PSC for rich burn engines. Factors are based on large population of engines. Factors are for engines at all loads, except as indicated. SCC = Source Classification Code. TOC = Total Organic Compounds. PM10 = Particulate Matter ≤ 10 microns (μm) aerodynamic diameter. A "<" sign in front of a factor means that the corresponding emission factor is based on one-half of the method detection limit.

[b] Emission factors were calculated in units of (lb/MMBtu) based on procedures in EPA Method 19. To convert from (lb/MMBtu) to (lb/10^6 scf), multiply by the heat content of the fuel. If the heat content is not available, use 1020 Btu/scf. To convert from (lb/MMBtu) to (lb/hp-hr) use the following equation:

$$\text{lb/hp-hr} = (\text{lb/MMBtu})(\text{heat input, MMBtu/hr})(\text{1/operating HP, 1/hp})$$

[c] Emission tests with unreported load conditions were not included in the data set.

[d] Based on 99.5% conversion of the fuel carbon to CO_2. CO_2 [lb/MMBtu] = (3.67)(%CON)(C)(D)(1/h), where %CON = percent conversion of fuel carbon to CO_2,

TABLE 1.4-2. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM NATURAL GAS COMBUSTION[a]

Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
CO_2[b]	120,000	A
Lead	0.0005	D
N_2O (Uncontrolled)	2.2	E
N_2O (Controlled-low-NO_X burner)	0.64	E
PM (Total)[c]	7.6	D
PM (Condensable)[c]	5.7	D
PM (Filterable)[c]	1.9	B
SO_2[d]	0.6	A
TOC	11	B
Methane	2.3	B
VOC	5.5	C

[a] Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. Data are for all natural gas combustion sources. To convert from $lb/10^6$ scf to $kg/10^6$ m^3, multiply by 16. To convert from $lb/10^6$ scf to 1b/MMBtu, divide by 1,020. The emission factors in this table may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to this average heating value. TOC = Total Organic Compounds. VOC = Volatile Organic Compounds.

[b] Based on approximately 100% conversion of fuel carbon to CO_2. $CO_2[lb/10^6 \text{ scf}] = (3.67)(CON)(C)(D)$, where CON = fractional conversion of fuel carbon to CO_2, C = carbon content of fuel by weight (0.76), and D = density of fuel, 4.2×10^4 $lb/10^6$ scf.

[c] All PM (total, condensible, and filterable) is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors presented here may be used to estimate PM_{10}, $PM_{2.5}$ or PM_1 emissions. Total PM is the sum of the filterable PM and condensible PM. Condensible PM is the particulate matter collected using EPA Method 202 (or equivalent). Filterable PM is the particulate matter collected on, or prior to, the filter of an EPA Method 5 (or equivalent) sampling train.

[d] Based on 100% conversion of fuel sulfur to SO_2. Assumes sulfur content is natural gas of 2,000 grains/10^6 scf. The SO_2 emission factor in this table can be converted to other natural gas sulfur contents by multiplying the SO_2 emission factor by the ratio of the site-specific sulfur content (grains/10^6 scf) to 2,000 grains/10^6 scf.

Waste Stream[5]	Destruction/Removal Efficiency (DRE)
VOC	98 percent (generic)
	99 percent for compounds containing no more than 3 carbons that contain no elements other than carbon and hydrogen in addition to the following compounds: methanol, ethanol, propanol, ethylene oxide and propylene oxide.
H_2S	98 percent
NH_3	case-by-case
CO	case-by-case

Air Contaminants	Emission Factors	Btu	lb/MMBtu
Thermal NO_x	Steam-assist	High Btu	0.0485 lb/MMBtu
		Low Btu	0.068 lb/MMBtu
	Other	High Btu	0.138 lb/MMBtu
		Low Btu	0.0641 lb/MMBtu

Air Contaminants	Emission Factors
Fuel NO_x	NO_x is 0.5 wt percent of inlet NH_3 in the sample calculations. The actual conversion of ammonia and other fuels to Fuel NO_x are subject to case-by-case review.

Air Contaminants	Emission Factors	Btu	lb/MMBtu
CO	Steam-assist	High Btu	0.3503 lb/MMBtu
		Low Btu	0.3465 lb/MMBtu
	Other	High Btu	0.2755 lb/MMBtu
		Low Btu	0.5496 lb/MMBtu

Air Contaminants	Emission Factors
PM	None, required to be smokeless
SO_2	100 percent S in fuel to SO_2

[5]The only exception of this is if inorganics might be emitted from the flare. In the case of landfills, the AP-42 PM factor may be used. In other cases, the emissions should be based on the composition of the waste stream routed to the flare.

Table 1.4-1. EMISSION FACTORS FOR NITROGEN OXIDES (NO_x) AND CARBON MONOXIDE (CO) FROM NATURAL GAS COMBUSTION[a]

Combustor Type (MMBtu/hr Heat Input) [SCC]	NO_x[b]		CO	
	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
Large Wall-Fired Boilers (>100) [1-01-006-01, 1-02-006-01, 1-03-006-01]				
Uncontrolled (Pre-NSPS)[c]	280	A	84	B
Uncontrolled (Post-NSPS)[c]	190	A	84	B
Controlled - Low NO_x burners	140	A	84	B
Controlled - Flue gas recirculation	100	D	84	B
Small Boilers (<100) [1-01-006-02, 1-02-006-02, 1-03-006-02, 1-03-006-03]				
Uncontrolled	100	B	84	B
Controlled - Low NO_x burners	50	D	84	B
Controlled - Low NO_x burners/Flue gas recirculation	32	C	84	B
Tangential-Fired Boilers (All Sizes) [1-01-006-04]				
Uncontrolled	170	A	24	C
Controlled - Flue gas recirculation	76	D	98	D
Residential Furnaces (<0.3) [No SCC]				
Uncontrolled	94	B	40	B

[a] Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. To convert from $lb/10^6$ scf to $kg/10^6$ m^3, multiply by 16. Emission factors are based on an average natural gas higher heating value of 1,020 Btu/scf. To convert from $1b/10^6$ scf to lb/MMBtu, divide by 1,020. The emission factors in this table may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to this average heating value. SCC = Source Classification Code. ND = no data. NA = not applicable.

[b] Expressed as NO_2. For large and small wall fired boilers with SNCR control, apply a 24 percent reduction to the appropriate NO_x emission factor. For tangential-fired boilers with SNCR control, apply a 13 percent reduction to the appropriate NO_x emission factor.

[c] NSPS=New Source Performance Standard as defined in 40 CFR 60 Subparts D and Db. Post-NSPS units are boilers with greater than 250 MMBtu/hr of heat input that commenced construction modification, or reconstruction after August 17, 1971, and units with heat input capacities between 100 and 250 MMBtu/hr that commenced construction modification, or reconstruction after June 19, 1984.

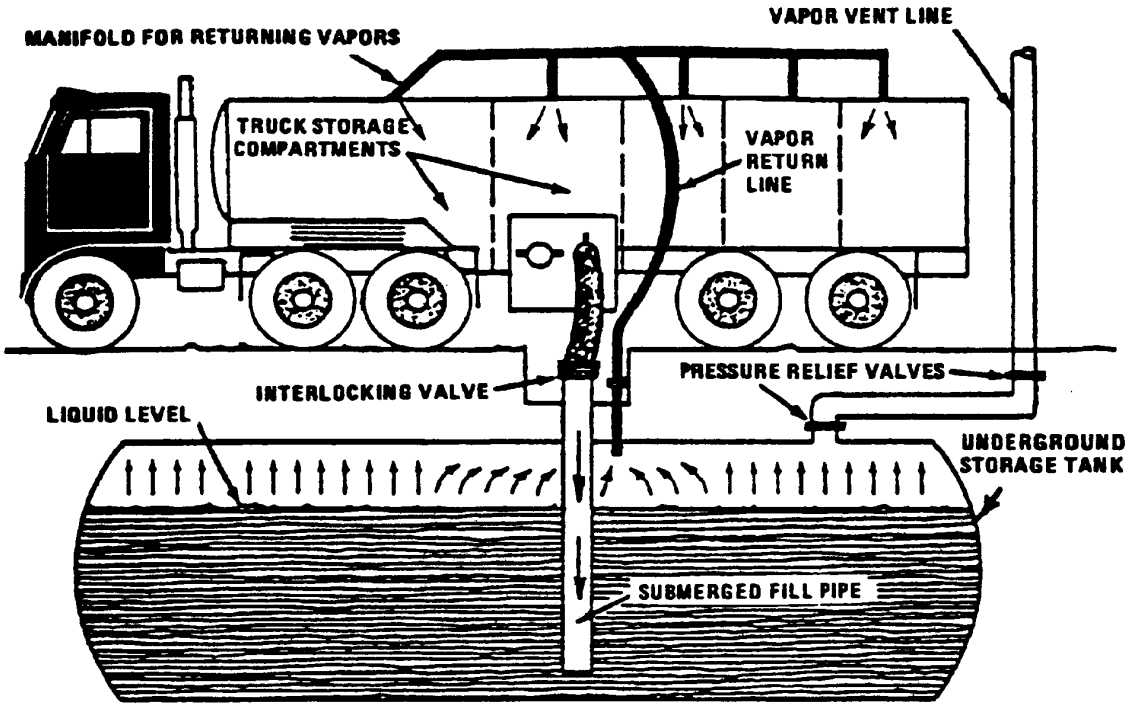

Figure 5.2-5. Tank truck unloading into a service station underground storage tank and practicing "vapor balance" form of emission control.

Table 5.2-1. SATURATION (S) FACTORS FOR CALCULATING PETROLEUM LIQUID LOADING LOSSES

Cargo Carrier	Mode Of Operation	S Factor
Tank trucks and rail tank cars	Submerged loading of a clean cargo tank	0.50
	Submerged loading: dedicated normal service	0.60
	Submerged loading: dedicated vapor balance service	1.00
	Splash loading of a clean cargo tank	1.45
	Splash loading: dedicated normal service	1.45
	Splash loading: dedicated vapor balance service	1.00
Marine vessels[a]	Submerged loading: ships	0.2
	Submerged loading: barges	0.5

[a] For products other than gasoline and crude oil. For marine loading of gasoline, use factors from Table 5.2-2. For marine loading of crude oil, use Equations 2 and 3 and Table 5.2-3.

TABLE 2-4. OIL AND GAS PRODUCTION OPERATIONS AVERAGE EMISSION FACTORS (kg/hr/source)

Equipment Type	Service[a]	Emission Factor (kg/hr/source)[b]
Valves	Gas	4.5E-03
	Heavy Oil	8.4E-06
	Light Oil	2.5E-03
	Water/Oil	9.8E-05
Pump seals	Gas	2.4E-03
	Heavy Oil	NA
	Light Oil	1.3E-02
	Water/Oil	2.4E-05
Others[c]	Gas	8.8E-03
	Heavy Oil	3.2E-05
	Light Oil	7.5E-03
	Water/Oil	1.4E-02
Connectors	Gas	2.0E-04
	Heavy Oil	7.5E-06
	Light Oil	2.1E-04
	Water/Oil	1.1E-04
Flanges	Gas	3.9E-04
	Heavy Oil	3.9E-07
	Light Oil	1.1E-04
	Water/Oil	2.9E-06
Open-ended lines	Gas	2.0E-03
	Heavy Oil	1.4E-04
	Light Oil	1.4E-03
	Water/Oil	2.5E-04

[a]Water/Oil emission factors apply to water streams in oil service with a water content greater than 50%, from the point of origin to the point where the water content reaches 99%. For water streams with a water content greater than 99%, the emission rate is considered negligible.

[b]These factors are for total organic compound emission rates (including non-VOC's such as methane and ethane) and apply to light crude, heavy crude, gas plant, gas production, and off shore facilities. "NA" indicates that not enough data were available to develop the indicated emission factor.

[c]The "other" equipment type was derived from compressors, diaphrams, drains, dump arms, hatches, instruments, meters, pressure relief valves, polished rods, relief valves, and vents. This "other" equipment type should be applied for any equipment type other than connectors, flanges, open-ended lines, pumps, or valves.

and outer diameter greater than or equal to 2.375 inch.

Tubing systems means piping equal to or less than one half inch diameter as per nominal pipe size.

Turbine meter means a flow meter in which a gas or liquid flow rate through the calibrated tube spins a turbine from which the spin rate is detected and calibrated to measure the fluid flow rate.

Vented emissions means intentional or designed releases of CH_4 or CO_2 containing natural gas or hydrocarbon gas (not including stationary combustion flue gas), including process designed flow to the atmosphere through seals or vent pipes, equipment blowdown for maintenance, and direct venting of gas used to power equipment (such as pneumatic devices).

Vertical well means a well bore that is primarily vertical but has some unintentional deviation or one or more intentional deviations to enter one or more subsurface targets that are offset horizontally from the surface location, intercepting the targets either vertically or at an angle.

Well testing venting and flaring means venting and/or flaring of natural gas at the time the production rate of a well is determined for regulatory, commercial, or technical purposes. If well testing is conducted immediately after well completion or workover, then it is considered part of well completion or workover.

[75 FR 74488, Nov. 30, 2010, as amended at 76 FR 80590, Dec. 23, 2011]

TABLE W–1A OF SUBPART W—DEFAULT WHOLE GAS EMISSION FACTORS FOR ONSHORE PETROLEUM AND NATURAL GAS PRODUCTION

Onshore petroleum and natural gas production	Emission factor (scf/hour/component)
Eastern U.S.	
Population Emission Factors—All Components, Gas Service [1]	
Valve	0.640
Connector	0.083
Open-ended Line	1.46
Pressure Relief Valve	0.97
Low Continuous Bleed Pneumatic Device Vents [2]	1.39
High Continuous Bleed Pneumatic Device Vents [2]	37.3
Intermittent Bleed Pneumatic Device Vents [2]	13.5
Pneumatic Pumps [3]	10.3
Population Emission Factors—All Components, Light Crude Service [4]	
Valve	0.04
Flange	0.002
Connector	0.005
Open-ended Line	0.04
Pump	0.01
Other [5]	0.23
Population Emission Factors—All Components, Heavy Crude Service [6]	
Valve	0.0004
Flange	0.0007
Connector (other)	0.0002
Open-ended Line	0.004
Other [5]	0.002
Western U.S.	
Population Emission Factors—All Components, Gas Service [1]	
Valve	2.903
Connector	0.396
Open-ended Line	0.748
Pressure Relief Valve	4.631
Low Continuous Bleed Pneumatic Device Vents [2]	1.77
High Continuous Bleed Pneumatic Device Vents [2]	47.4
Intermittent Bleed Pneumatic Device Vents [2]	17.1
Pneumatic Pumps [3]	10.3

Onshore petroleum and natural gas production	Emission factor (scf/hour/component)
Population Emission Factors—All Components, Light Crude Service [4]	
Valve	0.04
Flange	0.002
Connector	0.005
Open-ended Line	0.04
Pump	0.01
Other [5]	0.23
Population Emission Factors—All Components, Heavy Crude Service [6]	
Valve	0.0004
Flange	0.0007
Connector (other)	0.0002
Open-ended Line	0.004
Other [5]	0.002

[1] For multi-phase flow that includes gas, use the gas service emissions factors.
[2] Emission Factor is in units of ''scf/hour/device.''
[3] Emission Factor is in units of ''scf/hour/pump.''
[4] Hydrocarbon liquids greater than or equal to 20°API are considered ''light crude.''
[5] ''Others'' category includes instruments, loading arms, pressure relief valves, stuffing boxes, compressor seals, dump lever arms, and vents.
[6] Hydrocarbon liquids less than 20°API are considered ''heavy crude.''

[76 FR 80591, Dec. 23, 2011]

TABLE W–1B TO SUBPART W OF PART 98—DEFAULT AVERAGE COMPONENT COUNTS FOR MAJOR ONSHORE NATURAL GAS PRODUCTION EQUIPMENT

Major equipment	Valves	Connectors	Open-ended lines	Pressure relief valves
Eastern U.S.				
Wellheads	8	38	0.5	0
Separators	1	6	0	0
Meters/piping	12	45	0	0
Compressors	12	57	0	0
In-line heaters	14	65	2	1
Dehydrators	24	90	2	2
Western U.S.				
Wellheads	11	36	1	0
Separators	34	106	6	2
Meters/piping	14	51	1	1
Compressors	73	179	3	4
In-line heaters	14	65	2	1
Dehydrators	24	90	2	2

TABLE W–1C TO SUBPART W OF PART 98—DEFAULT AVERAGE COMPONENT COUNTS FOR MAJOR CRUDE OIL PRODUCTION EQUIPMENT

Major equipment	Valves	Flanges	Connectors	Open-ended lines	Other components
Eastern U.S.					
Wellhead	5	10	4	0	1
Separator	6	12	10	0	0
Heater-treater	8	12	20	0	0
Header	5	10	4	0	0
Western U.S.					
Wellhead	5	10	4	0	1
Separator	6	12	10	0	0
Heater-treater	8	12	20	0	0
Header	5	10	4	0	0

TABLE W–1D OF SUBPART W OF PART 98—DESIGNATION OF EASTERN AND WESTERN U.S.

Eastern U.S.	Western U.S.
Connecticut	Alabama
Delaware	Alaska
Florida	Arizona
Georgia	Arkansas
Illinois	California
Indiana	Colorado
Kentucky	Hawaii
Maine	Idaho
Maryland	Iowa
Massachusetts	Kansas
Michigan	Louisiana
New Hampshire	Minnesota
New Jersey	Mississippi
New York	Missouri
North Carolina	Montana
Ohio	Nebraska
Pennsylvania	Nevada
Rhode Island	New Mexico
South Carolina	North Dakota
Tennessee	Oklahoma
Vermont	Oregon
Virginia	South Dakota
West Virginia	Texas
Wisconsin	Utah
	Washington
	Wyoming

TABLE W–2 OF SUBPART W—DEFAULT TOTAL HYDROCARBON EMISSION FACTORS FOR ONSHORE NATURAL GAS PROCESSING

Onshore natural gas processing plants	Emission factor (scf/hour/component)
Leaker Emission Factors—Compressor Components, Gas Service	
Valve [1]	14.84
Connector	5.59
Open-Ended Line	17.27
Pressure Relief Valve	39.66
Meter	19.33
Leaker Emission Factors—Non-Compressor Components, Gas Service	
Valve [1]	6.42
Connector	5.71
Open-Ended Line	11.27
Pressure Relief Valve	2.01
Meter	2.93

[1] Valves include control valves, block valves and regulator valves.

[76 FR 80592, Dec. 23, 2011]

TABLE W–3 OF SUBPART W—DEFAULT TOTAL HYDROCARBON EMISSION FACTORS FOR ONSHORE NATURAL GAS TRANSMISSION COMPRESSION

Onshore natural gas transmission compression	Emission factor (scf/hour/component)
Leaker Emission Factors—Compressor Components, Gas Service	
Valve [1]	14.84
Connector	5.59
Open-Ended Line	17.27
Pressure Relief Valve	39.66
Meter	19.33
Leaker Emission Factors—Non-Compressor Components, Gas Service	
Valve [1]	6.42
Connector	5.71
Open-Ended Line	11.27
Pressure Relief Valve	2.01
Meter	2.93
Population Emission Factors—Gas Service	
Low Continuous Bleed Pneumatic Device Vents [2]	1.37
High Continuous Bleed Pneumatic Device Vents [2]	18.20

The following empirical expressions may be used to estimate the quantity in pounds (lb) of size-specific particulate emissions from an unpaved road, per vehicle mile traveled (VMT):

For vehicles traveling on unpaved surfaces at industrial sites, emissions are estimated from the following equation:

$$E = k\ (s/12)^a (W/3)^b \qquad (1a)$$

and, for vehicles traveling on publicly accessible roads, dominated by light duty vehicles, emissions may be estimated from the following:

$$E = \frac{k\ (s/12)^a (S/30)^d}{(M/0.5)^c} - C \qquad (1b)$$

where k, a, b, c and d are empirical constants (Reference 6) given below and

E = size-specific emission factor (lb/VMT)
s = surface material silt content (%)
W = mean vehicle weight (tons)
M = surface material moisture content (%)
S = mean vehicle speed (mph)
C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear.

The source characteristics s, W and M are referred to as correction parameters for adjusting the emission estimates to local conditions. The metric conversion from lb/VMT to grams (g) per vehicle kilometer traveled (VKT) is as follows:

1 lb/VMT = 281.9 g/VKT

The constants for Equations 1a and 1b based on the stated aerodynamic particle sizes are shown in Tables 13.2.2-2 and 13.2.2-4. The PM-2.5 particle size multipliers (k-factors) are taken from Reference 27.

Table 13.2.2-2. CONSTANTS FOR EQUATIONS 1a AND 1b

Constant	Industrial Roads (Equation 1a)			Public Roads (Equation 1b)		
	PM-2.5	PM-10	PM-30*	PM-2.5	PM-10	PM-30*
k (lb/VMT)	0.15	1.5	4.9	0.18	1.8	6.0
a	0.9	0.9	0.7	1	1	1
b	0.45	0.45	0.45	-	-	-
c	-	-	-	0.2	0.2	0.3
d	-	-	-	0.5	0.5	0.3
Quality Rating	B	B	B	B	B	B

*Assumed equivalent to total suspended particulate matter (TSP)
"-" = not used in the emission factor equation

Table 13.2.2-2 also contains the quality ratings for the various size-specific versions of Equation 1a and 1b. The equation retains the assigned quality rating, if applied within the ranges of source conditions, shown in Table 13.2.2-3, that were tested in developing the equation:

Table 13.2.2-3. RANGE OF SOURCE CONDITIONS USED IN DEVELOPING EQUATION 1a AND 1b

Emission Factor	Surface Silt Content, %	Mean Vehicle Weight		Mean Vehicle Speed		Mean No. of Wheels	Surface Moisture Content, %
		Mg	ton	km/hr	mph		
Industrial Roads (Equation 1a)	1.8-25.2	1.8-260	2-290	8-69	5-43	4-17[a]	0.03-13
Public Roads (Equation 1b)	1.8-35	1.4-2.7	1.5-3	16-88	10-55	4-4.8	0.03-13

[a] See discussion in text.

As noted earlier, the models presented as Equations 1a and 1b were developed from tests of traffic on unpaved surfaces. Unpaved roads have a hard, generally nonporous surface that usually dries quickly after a rainfall or watering, because of traffic-enhanced natural evaporation. (Factors influencing how fast a road dries are discussed in Section 13.2.2.3, below.) The quality ratings given above pertain to the mid-range of the measured source conditions for the equation. A higher mean vehicle weight and a higher than normal traffic rate may be justified when performing a worst-case analysis of emissions from unpaved roads.

The emission factors for the exhaust, brake wear and tire wear of a 1980's vehicle fleet (*C*) was obtained from EPA's MOBILE6.2 model [23]. The emission factor also varies with aerodynamic size range

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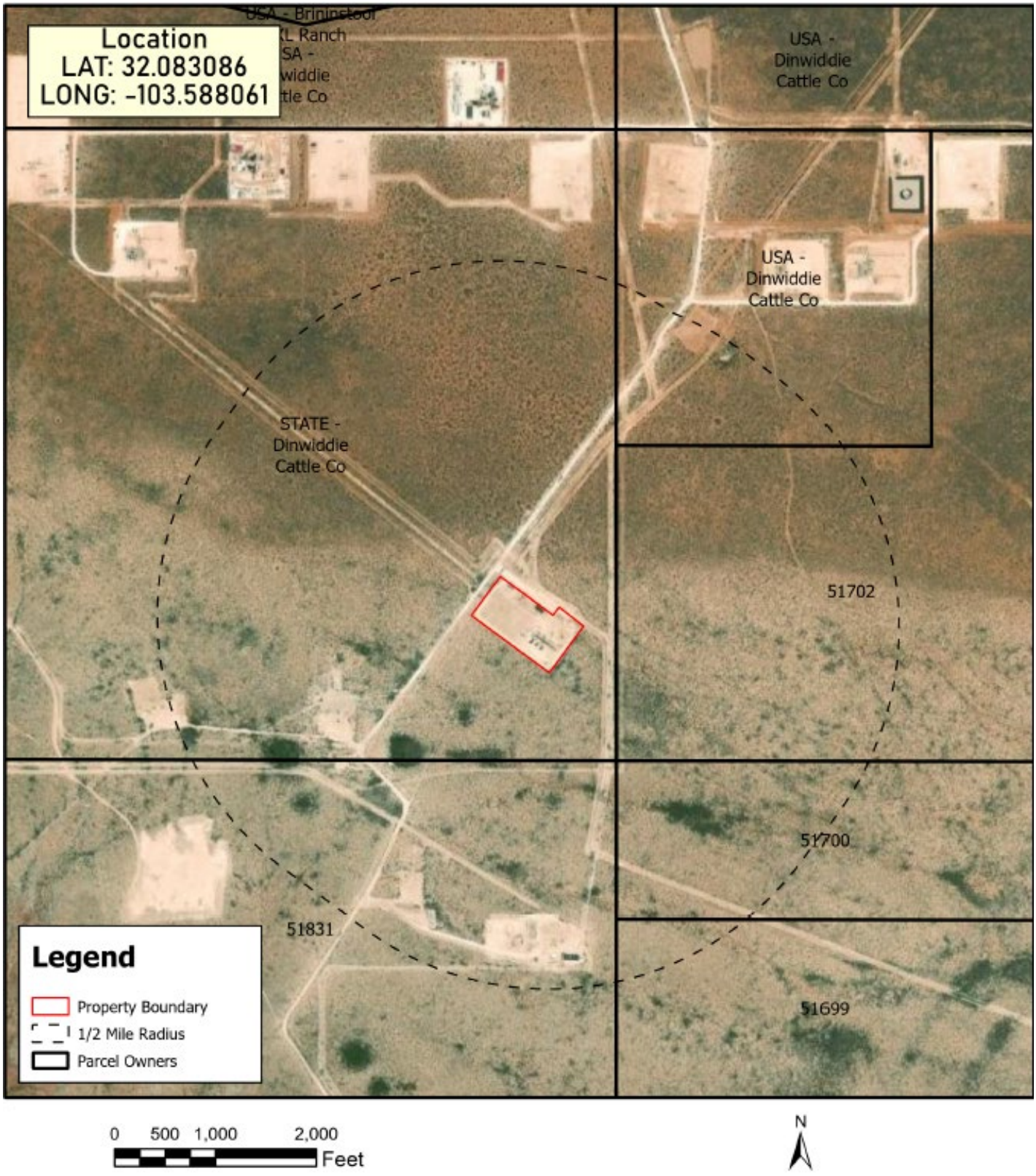
Section 8

Map(s)

A map such as a 7.5 minute topographic quadrangle showing the exact location of the source. The map shall also include the following:

The UTM or Longitudinal coordinate system on both axes	An indicator showing which direction is north
A minimum radius around the plant of 0.8km (0.5 miles)	Access and haul roads
Topographic features of the area	Facility property boundaries
The name of the map	The area which will be restricted to public access
A graphical scale	

A topographical map is attached to this section.



RESOLUTE COMPLIANCE, LLC Purposeful Solutions. Unwavering Service.	**Delaware G&P, LLC** **Horned Frog Compressor Station** **Lea County, NM** **Site Location Map**	**Project No.** Env-EnLink-Horned Frog **Report No.** NSR-0254 **Date:** May 2024 **Figure 2**

Section 9

Proof of Public Notice

(for NSR applications submitting under 20.2.72 or 20.2.74 NMAC)

(This proof is required by: 20.2.72.203.A.14 NMAC "Documentary Proof of applicant's public notice")

☒ **I have read the AQB "Guidelines for Public Notification for Air Quality Permit Applications"**

This document provides detailed instructions about public notice requirements for various permitting actions. It also provides public notice examples and certification forms. Material mistakes in the public notice will require a re-notice before issuance of the permit.

Unless otherwise allowed elsewhere in this document, the following items document proof of the applicant's Public Notification. Please include this page in your proof of public notice submittal with checkmarks indicating which documents are being submitted with the application.

New Permit and **Significant Permit Revision** public notices must include all items in this list.

Technical Revision public notices require only items 1, 5, 9, and 10.

Per the Guidelines for Public Notification document mentioned above, include:

1. ☒ A copy of the certified letter receipts with post marks (20.2.72.203.B NMAC)
2. ☒ A list of the places where the public notice has been posted in at least four publicly accessible and conspicuous places, including the proposed or existing facility entrance. (e.g: post office, library, grocery, etc.)
3. ☒ A copy of the property tax record (20.2.72.203.B NMAC).
4. ☒ A sample of the letters sent to the owners of record.
5. ☒ A sample of the letters sent to counties, municipalities, and Indian tribes.
6. ☒ A sample of the public notice posted and a verification of the local postings.
7. ☒ A table of the noticed citizens, counties, municipalities and tribes and to whom the notices were sent in each group.
8. ☒ A copy of the public service announcement (PSA) sent to a local radio station and documentary proof of submittal.
9. ☒ A copy of the classified or legal ad including the page header (date and newspaper title) or its affidavit of publication stating the ad date, and a copy of the ad. When appropriate, this ad shall be printed in both English and Spanish.
10. ☒ A copy of the display ad including the page header (date and newspaper title) or its affidavit of publication stating the ad date, and a copy of the ad. When appropriate, this ad shall be printed in both English and Spanish.
11. ☒ A map with a graphic scale showing the facility boundary and the surrounding area in which owners of record were notified by mail. This is necessary for verification that the correct facility boundary was used in determining distance for notifying land owners of record.

Sample of Posted Notice and Proof of Posting
Horned Frog Compressor Station
Delaware G&P, LLC

Facility entrance

Woolworth Community Library – 100 E Utah Ave, Jal, NM 88252

Jal City Hall – 710 W Wyoming Ave, Jal, NM 88525

Post Office 111 S 4th St., Jal, NM 88252

NOTICE

Delaware G&P, LLC announces its application to the New Mexico Environment Department for an air quality permit for the **modification** of its **oil and gas** facility. The expected date of application submittal to the Air Quality Bureau is **May 2024.**

The exact location for the proposed facility, known as **Horned Frog Compressor Station**, is located at latitude **32.083086** dec deg North and longitude **-103.588061** dec deg West. The approximate location of this facility is **23.5** miles **West** of **Jal** in **Lea** County.

The proposed **modification** consists of nine compressor engines, two generator engines, six condensate tanks, two produced water tanks, one gunbarrel separator, two glycol reboilers, two TEG dehydrators, condensate loadout, produced water loadout, one combustor, haul road fugitives, facility piping fugitives, and startup, shutdown, maintenance emissions.

The estimated maximum quantities of any regulated air contaminants will be as follows in pounds per hour (pph) and tons per year (tpy). These reported emissions could change slightly during the course of the Department's review:

Pollutant:	Pounds per hour	Tons per year
PM_{10}	3.5 pph	11.5 tpy
$PM_{2.5}$	3.0 pph	11.0 tpy
Sulfur Dioxide (SO_2)	1.0 pph	4.0 tpy
Nitrogen Oxides (NO_x)	20.0 pph	82.0 tpy
Carbon Monoxide (CO)	25.0 pph	106.5 tpy
Volatile Organic Compounds (VOC)	1768.0 pph	128.5 tpy
Total sum of all Hazardous Air Pollutants (HAPs)	60.5 pph	20.0 tpy
Green House Gas Emissions as Total CO_2e	n/a	296,463.0 tpy

The standard and maximum operating schedules of the facility will be from 12:00 a.m. to 11:59 p.m. 7 days a week and a maximum of 52 weeks per year.

The owner and/or operator of the Facility is: **Delaware G&P, LLC; 1722 Routh Street, Suite 1300, Dallas, TX 75201**

If you have any comments about the construction or operation of this facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to this address: Permit Programs Manager; New Mexico Environment Department; Air Quality Bureau; 525 Camino de los Marquez, Suite 1; Santa Fe, New Mexico; 87505-1816. Other comments and questions may be submitted verbally. (505) 476-4300; 1 800 224-7009.

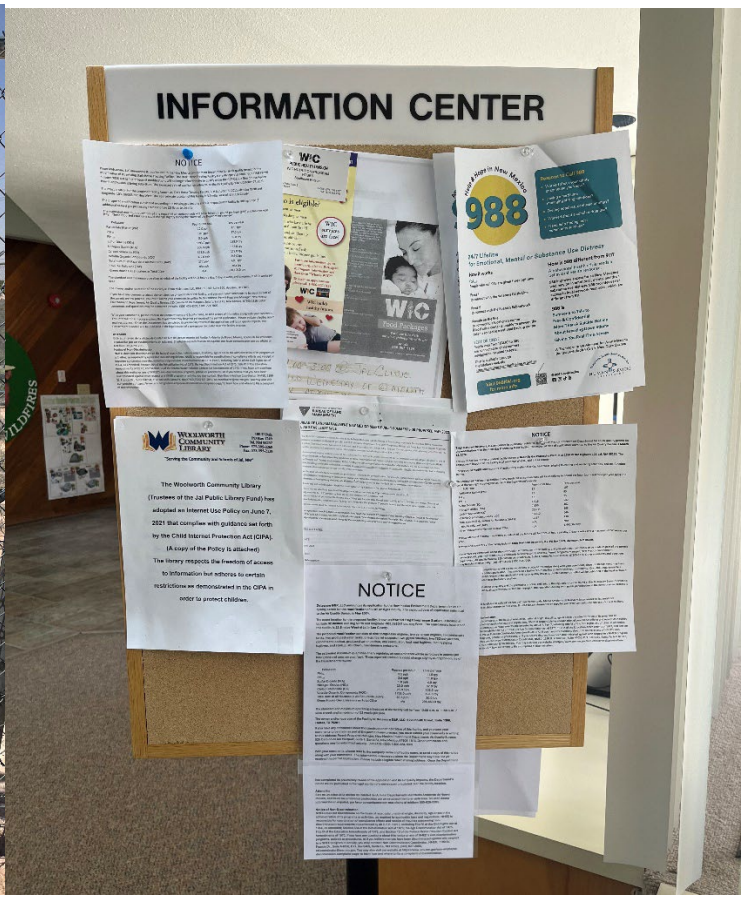
With your comments, please refer to the company name and facility name, or send a copy of this notice along with your comments. This information is necessary since the Department may have not yet received the permit application. Please include a legible return mailing address. Once the Department

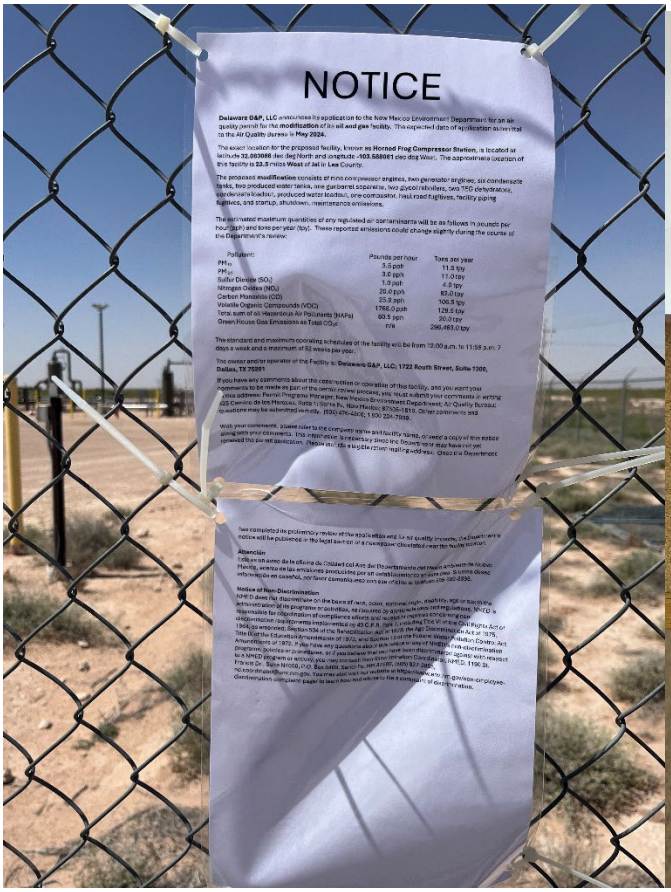
has completed its preliminary review of the application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location.

Attención
Este es un aviso de la oficina de Calidad del Aire del Departamento del Medio Ambiente de Nuevo México, acerca de las emisiones producidas por un establecimiento en esta área. Si usted desea información en español, por favor comuníquese con esa oficina al teléfono 505-629-3395.

Notice of Non-Discrimination
NMED does not discriminate on the basis of race, color, national origin, disability, age or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Part 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this notice or any of NMED's non-discrimination programs, policies or procedures, or if you believe that you have been discriminated against with respect to a NMED program or activity, you may contact: Non-Discrimination Coordinator, NMED, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@env.nm.gov. You may also visit our website at https://www.env.nm.gov/non-employee-discrimination-complaint-page/ to learn how and where to file a complaint of discrimination.


NOTICE
ENLINK
MIDSTREAM
HORNED FROG COMPRESSOR STATION
1404 BATTLE AXE ROAD
JAL, NEW MEXICO 88252
IN CASE OF EMERGENCY CALL
1-877-593-0822


INFORMATION CENTER
NOTICE
WIC
988
Woolworth Community Library
The Woolworth Community Library (Trustees of the Jal Public Library Fund) has adopted an Internet Use Policy on June 7, 2021 that complies with guidance set forth by the Child Internet Protection Act (CIPA).
(A copy of the Policy is attached)
The library respects the freedom of access to information but adheres to certain restrictions as demonstrated in the CIPA in order to protect children.
NOTICE


NOTICE
Delaware G&P, LLC announces its application to the New Mexico Environment Department for an air quality permit for the modification of its oil and gas facility. The expected date of application submittal to the Air Quality Bureau is May 2024.
The exact location for the proposed facility, known as Horned Frog Compressor Station, is located at latitude 32.083086 dec deg North and longitude -103.588061 dec deg West. The approximate location of this facility is 23.5 miles West of Jal in Lea County.
The proposed modification consists of nine compressor engines, two generator engines, six condensate tanks, two produced water tanks, one gunbarrel separator, two glycol reboilers, two TEG dehydrators, condensate loadout, produced water loadout, one combustor, haul road fugitives, facility piping fugitives, and startup, shutdown, maintenance emissions.
The estimated maximum quantities of any regulated air contaminants will be as follows in pounds per hour (pph) and tons per year (tpy). These reported emissions could change slightly during the course of the Department's review:
Pollutant: Pounds per hour Tons per year
PM10 3.5 pph 11.5 tpy
PM2.5 3.0 pph 11.0 tpy
Sulfur Dioxide (SO2) 1.0 pph 4.0 tpy
Nitrogen Oxides (NOx) 20.0 pph 82.0 tpy
Carbon Monoxide (CO) 25.0 pph 106.5 tpy
Volatile Organic Compounds (VOC) 1768.0 pph 128.5 tpy
Total sum of all Hazardous Air Pollutants (HAPs) 60.5 pph 20.0 tpy
Green House Gas Emissions as Total CO2e n/a 296,463.0 tpy
The standard and maximum operating schedules of the facility will be from 12:00 a.m. to 11:59 p.m. 7 days a week and a maximum of 52 weeks per year.
The owner and/or operator of the Facility is: Delaware G&P, LLC; 1722 Routh Street, Suite 1300, Dallas, TX 75201
If you have any comments about the construction or operation of this facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to this address: Permit Programs Manager; New Mexico Environment Department; Air Quality Bureau; 525 Camino de los Marquez, Suite 1; Santa Fe, New Mexico; 87505-1816. Other comments and questions may be submitted verbally. (505) 476-4300; 1 800 224-7009.
With your comments, please refer to the company name and facility name, or send a copy of this notice along with your comments. This information is necessary since the Department may have not yet received the permit application. Please include a legible return mailing address. Once the Department has completed its preliminary review of the application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location.
Atención
Este es un aviso de la oficina de Calidad del Aire del Departamento del Medio Ambiente de Nuevo México, acerca de las emisiones producidas por un establecimiento en esta área. Si usted desea información en español, por favor comuníquese con esa oficina al teléfono 505-629-3395.
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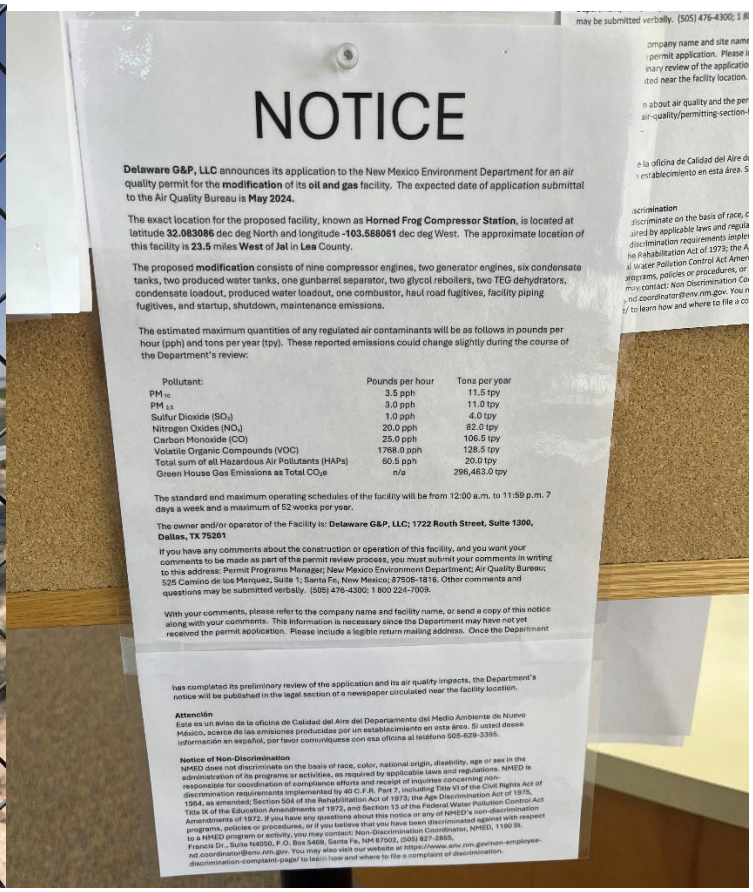
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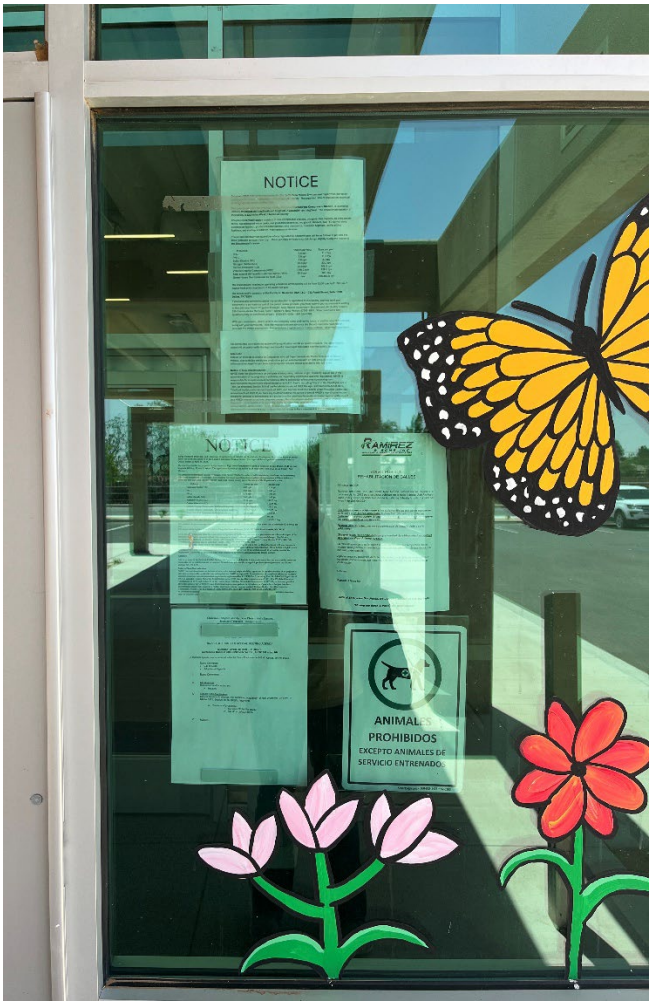
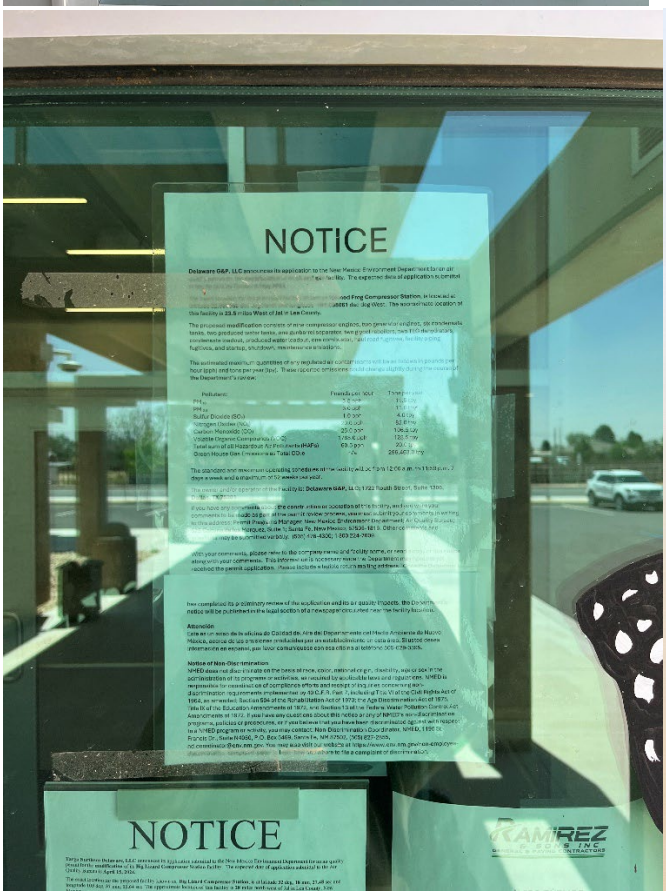

NOTICE
NOTICE
ANIMALES
PROHIBIDOS
EXCEPTO ANIMALES DE
SERVICIO ENTRENADOS


NOTICE
Full Service Hours:
Mon. - Fri. 8:30am - 4:30pm
Closed for Lunch 11:30am - 12:30pm
Saturday Closed
Sunday & Holidays Closed
P.O. Box Section Hours:
24 Hours A Day/7 Days A Week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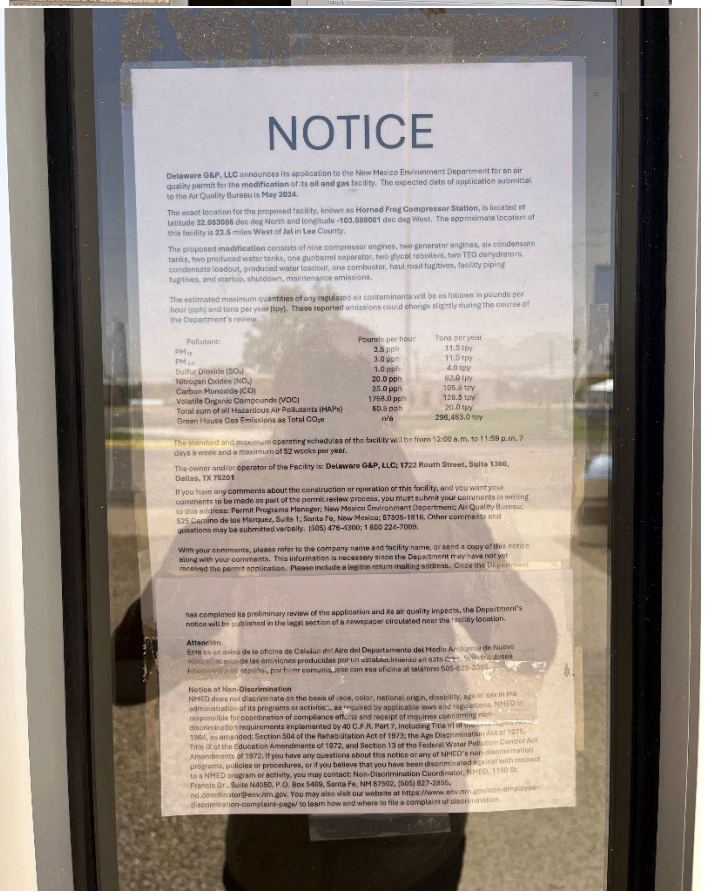
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Nitrogen Oxides (NOx) 20.0 pph 82.0 tpy
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General Posting of Notices – Certification

I, Breanne Halfmann, the undersigned, certify that on **DATE,** posted a true and correct copy of the attached Public Notice in the following publicly accessible and conspicuous places in the **City** of **Jal** in **Lea** County, State of New Mexico on the following dates:

1. Facility entrance –5/6/2024
2. Woolworth Community Library – 100 E Utah Ave, Jal, NM 88252 – 5/6/2024
3. Jal City Hall – 710 W Wyoming Ave, Jal, NM 88525 – 5/6/2024
4. Post Office 111 S 4th St., Jal, NM 88252 – 5/6/2024

Signed this 6th day of May, 2024.

Breanne Halfmann
Signature

5/6/2024
Date

Breanne Halfmann
Printed Name

Table of Notified Owners, Counties, Municipalities, Indian Tribes
Horned Frog Compressor Station
Delaware G&P, LLC

Owners within ½ mile of the Property Boundary	
Occidental Permian Ltd – Oil and Gas	5 Greenway Plaza, Suite 110 Houston, TX 77046-0521
USA- Dinwiddie Cattle Co -agricultural	1893 Cross Y Rd Roswell, NM 88202
Basin Properties Ranches, LLC	P.O. Box 5677 Abilene, TX 79608
Intrepid Potash – NM LLC	101 17th Street, Suite 1050 Denver, CO 80202
BLM	301 Dinosaur Trail Santa Fe, NM 87508
State Land Office	310 Old Santa Fe Trail Santa Fe, NM 87508
Municipalities within 10 miles of the Property Boundary	
Lea County Clerk's Office	PO Box 1507 Lovington, NM 88260
Eddy County Clerk's Office	101 W Greene Street Carlsbad, NM 88220

Sample of Letter Sent to Owners, Counties, Municipalities, Indian Tribes

CERTIFIED MAIL XXXX XXXX XXXX XXXX
RETURN RECEIPT REQUESTED *(certified mail is required, **return receipt is optional**)*

To Whom it May Concern,
Delaware G&P, LLC announces its application to the New Mexico Environment Department for an air quality permit for the **modification** of its **oil and gas** facility. The expected date of application submittal to the Air Quality Bureau is **May 2024.**

The exact location for the proposed facility, known as **Horned Frog Compressor Station**, is located at latitude **32.083086** dec deg North and longitude **-103.588061** dec deg West. The approximate location of this facility is **23.5** miles **West** of **Jal** in **Lea** County.

The proposed **modification** consists of nine compressor engines, two generator engines, six condensate tanks, two produced water tanks, one gunbarrel separator, two glycol reboilers, two TEG dehydrators, condensate loadout, produced water loadout, one combustor, haul road fugitives, facility piping fugitives, and startup, shutdown, maintenance emissions.

The estimated maximum quantities of any regulated air contaminants will be as follows in pounds per hour (pph) and tons per year (tpy). These reported emissions could change slightly during the course of the Department's review:

Pollutant:	Pounds per hour	Tons per year
PM_{10}	3.5 pph	11.5 tpy
$PM_{2.5}$	3.0 pph	11.0 tpy
Sulfur Dioxide (SO_2)	1.0 pph	4.0 tpy
Nitrogen Oxides (NO_x)	20.0 pph	82.0 tpy
Carbon Monoxide (CO)	25.0 pph	106.5 tpy
Volatile Organic Compounds (VOC)	1768.0 pph	128.5 tpy
Total sum of all Hazardous Air Pollutants (HAPs)	60.5 pph	20.0 tpy
Green House Gas Emissions as Total CO_2e	n/a	296,463.0 tpy

The standard and maximum operating schedules of the facility will be from 12:00 a.m. to 11:59 p.m. 7 days a week and a maximum of 52 weeks per year.

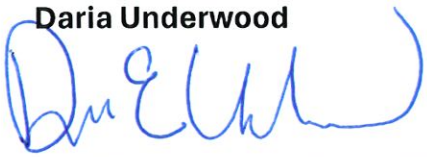
The owner and/or operator of the Facility is:
Delaware G&P, LLC
1722 Routh Street, Suite 1300
Dallas, TX 75201

If you have any comments about the construction or operation of this facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to this address: Permit Programs Manager; New Mexico Environment Department; Air Quality Bureau; 525 Camino de los Marquez, Suite 1; Santa Fe, New Mexico; 87505-1816. Other comments and questions may be submitted verbally. (505) 476-4300; 1 800 224-7009.

Please refer to the company name and facility name, or send a copy of this notice along with your comments, since the Department may have not yet received the permit application. Please include a legible return mailing address with your comments. Once the Department has performed a preliminary review of the application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location.

Attención
Este es un aviso de la oficina de Calidad del Aire del Departamento del Medio Ambiente de Nuevo México, acerca de las emisiones producidas por un establecimiento en esta área. Si usted desea información en español, por favor comuníquese con esa oficina al teléfono 505-629-3395.

Sincerely,
Daria Underwood



303 W Wall Street, Suite 202
Midland, TX 79701

Notice of Non-Discrimination
NMED does not discriminate on the basis of race, color, national origin, disability, age or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Part 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this notice or any of NMED's non-discrimination programs, policies or procedures, or if you believe that you have been discriminated against with respect to a NMED program or activity, you may contact: Non-Discrimination Coordinator, NMED, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@env.nm.gov. You may also visit our website at https://www.env.nm.gov/non-employee-discrimination-complaint-page/ to learn how and where to file a complaint of discrimination.

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Carlsbad, NM 88220

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Certified Mail Fee	$4.40
Extra Services & Fees (check box, add fee as appropriate)	$3.65
☑ Return Receipt (hardcopy)	$0.00
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Postage	$0.68
Total Postage and Fees	$8.73

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Street and Apt. No., or PO Box No.: 101 W. Greene St.
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PS Form 3800, January 2023 PSN 7530-02-000-9047 See Reverse for Instructions

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☑ Return Receipt (hardcopy)	$0.00
☐ Return Receipt (electronic)	$0.00
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☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$0.68
Total Postage and Fees	$8.73

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05/06/2024

Sent To: Lea County Clerk's Office
Street and Apt. No., or POBox No.: PO Box 1507
City, State, ZIP+4®: Lovington, NM 88260-1507

PS Form 3800, January 2023 PSN 7530-02-000-9047 See Reverse for Instructions

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For delivery information, visit our website at *www.usps.com®*.
Santa Fe, NM 87501

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Certified Mail Fee	$4.40
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☐ Return Receipt (hardcopy)	$0.00
☐ Return Receipt (electronic)	$0.00
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☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$0.68
Total Postage and Fees	$8.73

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05/06/2024

Sent To: Nm State Land Office
Street and Apt. No., or PO Box No.: 310 Old Santa Fe Trail
City, State, ZIP+4®: Santa Fe, NM 87501-2708

PS Form 3800, January 2023 PSN 7530-02-000-9047 See Reverse for Instructions

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For delivery information, visit our website at *www.usps.com®*.
Santa Fe, NM 87508

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Extra Services & Fees (check box, add fee as appropriate)	$3.65
☑ Return Receipt (hardcopy)	$0.00
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$0.68
Total Postage and Fees	$8.73

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05/06/2024

Sent To: Bureau of Land Management
Street and Apt. No., or PO Box No.: 301 Dinosaur Trail
City, State, ZIP+4®: Santa Fe, NM 87508-1560

PS Form 3800, January 2023 PSN 7530-02-000-9047 See Reverse for Instructions

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For delivery information, visit our website at *www.usps.com®*.
Abilene, TX 79608

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Certified Mail Fee	$4.40
Extra Services & Fees (check box, add fee as appropriate)	$3.65
☐ Return Receipt (hardcopy)	$0.00
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$0.68
Total Postage and Fees	$8.73

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05/06/2024

Sent To: Basin Properties Ranches, LLC
Street and Apt. No., or PO Box No.: PO Box 5677
City, State, ZIP+4®: Abilene, TX 79608-5677

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For delivery information, visit our website at *www.usps.com®*.
Denver, CO 80202

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Certified Mail Fee	$4.40
Extra Services & Fees (check box, add fee as appropriate)	$3.65
☑ Return Receipt (hardcopy)	$0.00
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$0.68
Total Postage and Fees	$8.73

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05/06/2024

Sent To: Intrepid Potash NM LLC
Street and Apt. No., or PO Box No.: 707 17th St, Suite 4200
City, State, ZIP+4®: Denver, CO 80202-3432

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Roswell, NM 88202

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Certified Mail Fee	$4.40
$	$0.00
Extra Services & Fees (check box, add fee as appropriate)	
☑ Return Receipt (hardcopy)	$1.00
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$0.68
$	
Total Postage and Fees	$6.08
$	

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07/01/2024

Sent To: Dinwiddie Cattle Co
Street and Apt. No., or PO Box No.: 1893 Cross Y Rd
City, State, ZIP+4®: Roswell, NM 88202

PS Form 3800, January 2023 PSN 7530-02-000-9047 See Reverse for Instructions

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U.S. Postal Service™
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For delivery information, visit our website at *www.usps.com®*.
Houston, TX 77046

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Certified Mail Fee	$4.40
$	$0.00
Extra Services & Fees (check box, add fee as appropriate)	
☐ Return Receipt (hardcopy)	$0.00
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$0.68
$	
Total Postage and Fees	$8.08
$	

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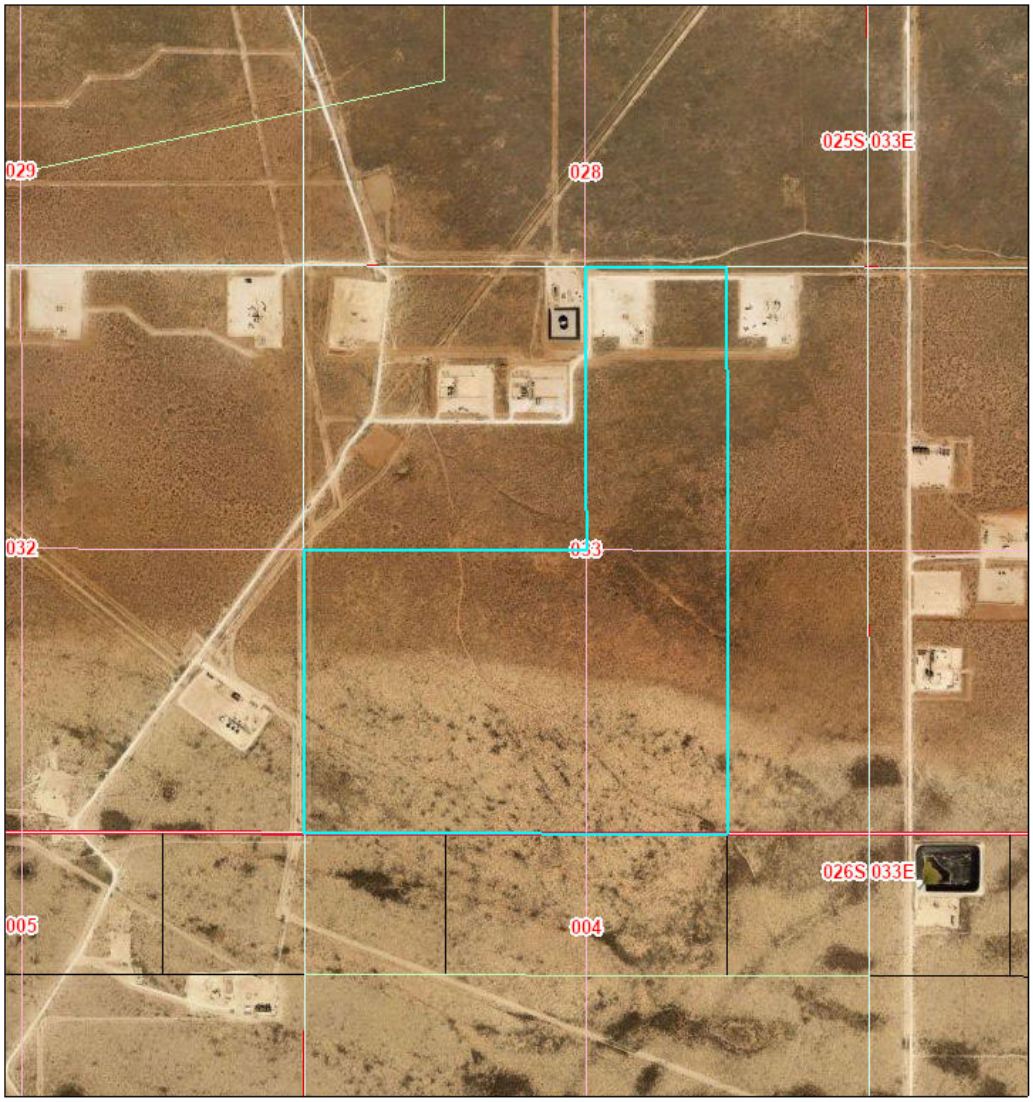
07/01/2024

Sent To: Occidental Permian Ltd
Street and Apt. No., or PO Box No.: 5 Greenway Plaza, Suite 110
City, State, ZIP+4®: Houston, Tx 77046-0521

PS Form 3800, January 2023 PSN 7530-02-000-9047 See Reverse for Instructions

Lea County Parcel Report



Sections

Parcels

1:18,056

0 0.13 0.25 0.5 mi

0 0.2 0.4 0.8 km

Esri Community Maps Contributors, Texas Parks & Wildlife, CONANP, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS

Parcel Details

OWNER NUMBER: 51702 **UPC CODE:** 4194150233331
PARCEL NUMBER: 4000517020001

Owner Information	
Owner:	INTREPID POTASH-NEW MEXICO LLC
Mailing Address:	707 17TH ST
Property Address:	

Subdivision Information	
Name:	
Unit:	
Block:	
Lot:	

Legal Information
320.00 AC BEING W2E2, SW4

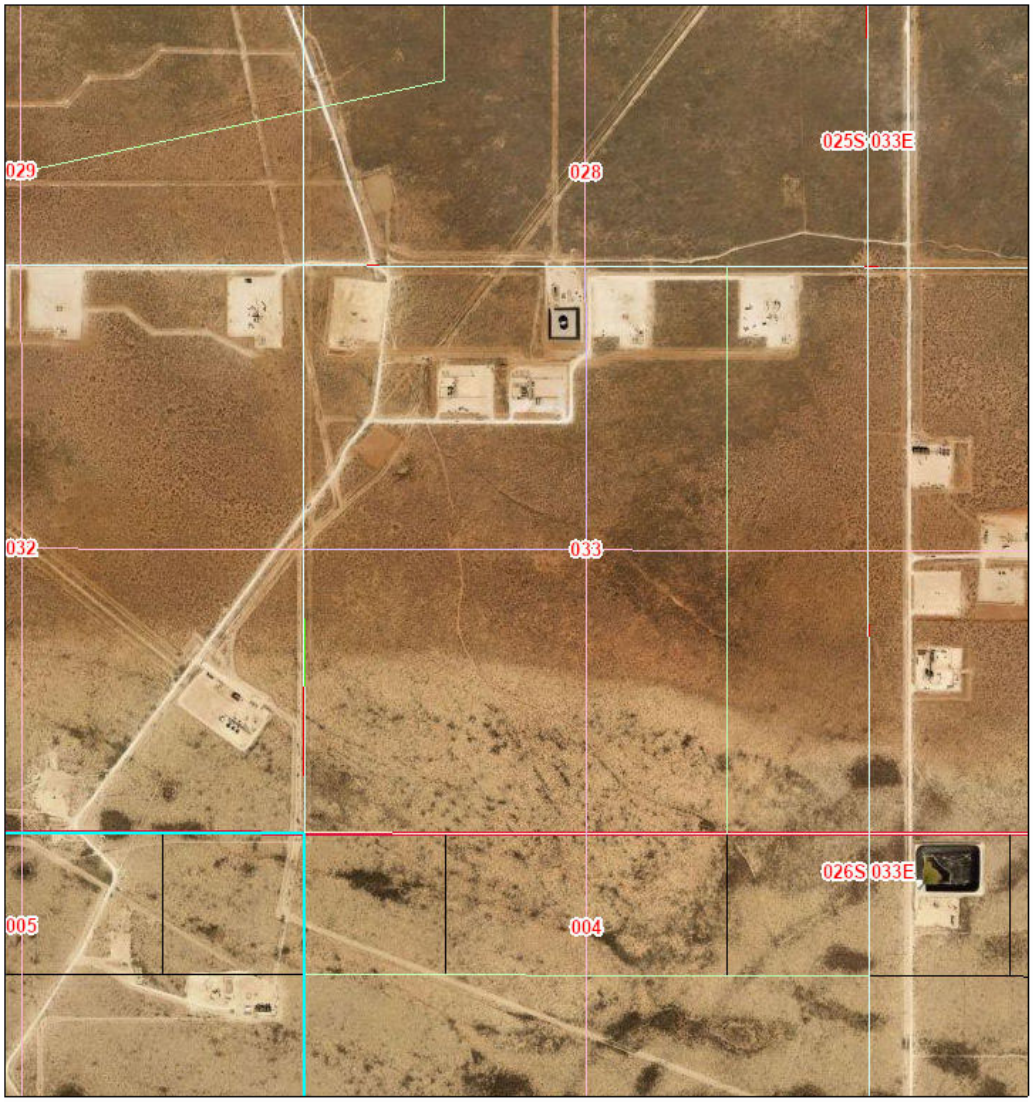
Other Information			
Taxable Value:	$16974	**Deed Book:**	2150
Exempt Value:	$0	**Deed Page:**	23
Net Value:	$16974	**District:**	190
Livestock Value:	$0	**Section:**	33
Manufactured Home Value:	$0	**Township:**	25
Personal Property:	$0	**Range:**	33
Land Value:	$50922	**Date Filed:**	20190501
Improvement Value:	$0	**Most Current Tax:**	391
Full Value:	$50922	**Year Recorded:**	

Square Foot and Year Built listed only to be used for comparative purposes, NOT to be used for commerce.

Building Information			
Year Built:		**Number of Stories:**	
Basement SQFT:		**First Floor SQFT:**	
Second Floor SQFT:			

Lea County, New Mexico Disclaimer
Information deeded reliable but not guaranteed. Copyright © 2023
MAP TO BE USED FOR TAX PURPOSES ONLY. NOT TO BE USED FOR CONVEYANCE.

Lea County Parcel Report



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Esri Community Maps Contributors, Texas Parks & Wildlife, CONANP, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS

Parcel Details

OWNER NUMBER: 51831 **UPC CODE:** 4193151265265
PARCEL NUMBER: 4000518310001

Owner Information	
Owner:	BASIN PROPERTIES RANCHES LLC
Mailing Address:	PO BOX 5677
Property Address:	

Subdivision Information	
Name:	
Unit:	
Block:	
Lot:	

Legal Information
640.00 AC ALL

Other Information			
Taxable Value:	$6898	**Deed Book:**	2140
Exempt Value:	$0	**Deed Page:**	578
Net Value:	$6898	**District:**	190
Livestock Value:	$7257	**Section:**	05
Manufactured Home Value:	$0	**Township:**	26
Personal Property:	$0	**Range:**	33
Land Value:	$8436	**Date Filed:**	20181011
Improvement Value:	$5001	**Most Current Tax:**	431
Full Value:	$20694	**Year Recorded:**	

Square Foot and Year Built listed only to be used for comparative purposes, NOT to be used for commerce.

Building Information			
Year Built:		**Number of Stories:**	
Basement SQFT:		**First Floor SQFT:**	
Second Floor SQFT:			

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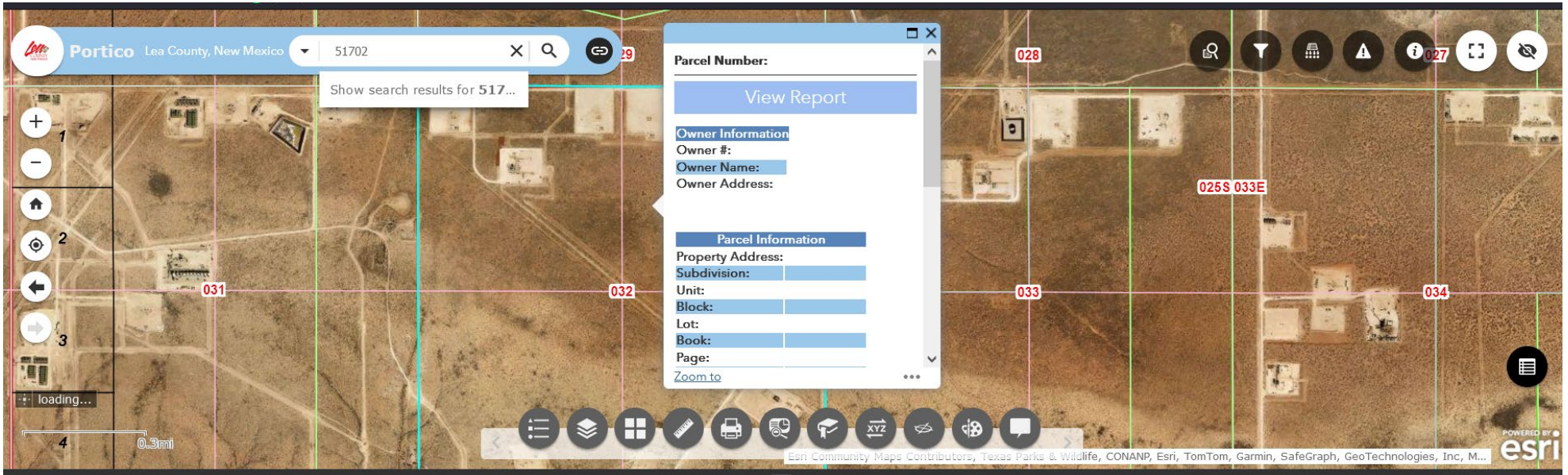

Lea County Addresses | Parcel Lines | Lot Lines | Subdivisions | City Limits | School Districts | Lea County Roads | City of Hobbs Roads | **Parcels** | Lea County Boundary

Options | Filter by map extent | Zoom to | Clear selection | Refresh

Triadic	UPC XY	Calculated Acres	Township	Range	Fcode	Parcel Code	Year Built	Number of Stories	SQFT Basement	SQFT 1st Floor	SQFT 2nd Floor	Date Modified	Time Modified	Total SQFT
STATE - Dinwiddie Cattle Co	41931502662	640.31	25	33	500									

NOTICE OF AIR QUALITY PERMIT APPLICATION

Delaware G&P, LLC announces its application to the New Mexico Environment Department for an air quality permit for the **modification** of its **oil and gas** facility. The expected date of application submittal to the Air Quality Bureau is **May 2024.**

The exact location for the proposed facility, known as **Horned Frog Compressor Station**, is located at latitude **32.083086** dec deg North and longitude **-103.588061** dec deg West. The approximate location of this facility is **23.5** miles **West** of **Jal** in **Lea** County.

The proposed **modification** consists of nine compressor engines, two generator engines, six condensate tanks, two produced water tanks, one gunbarrel separator, two glycol reboilers, two TEG dehydrators, condensate loadout, produced water loadout, one combustor, haul road fugitives, facility piping fugitives, and startup, shutdown, maintenance emissions.

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Volatile Organic Compounds (VOC)	1768.0 pph	128.5 tpy
Total sum of all Hazardous Air Pollutants (HAPs)	60.5 pph	20.0 tpy
Green House Gas Emissions as Total CO_2e	n/a	296,463.0 tpy

The standard and maximum operating schedules of the facility will be from 12:00 a.m. to 11:59 p.m. 7 days a week and a maximum of 52 weeks per year.

The owner and/or operator of the Facility is:
Delaware G&P, LLC
1722 Routh Street, Suite 1300
Dallas, TX 75201

If you have any comments about the construction or operation of this facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to this address: Permit Programs Manager; New Mexico Environment Department; Air Quality Bureau; 525 Camino de los Marquez, Suite 1; Santa Fe, New Mexico; 87505-1816. Other comments and questions may be submitted verbally. (505) 476-4300; 1 800 224-7009.

Please refer to the company name and site name, or send a copy of this notice along with your comments, since the Department may have not yet received the permit application. Please include a legible return mailing address with your comments. Once the Department has performed a preliminary review of the application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location.

General information about air quality and the permitting process, and links to the regulations can be found at the Air Quality Bureau's website: www.env.nm.gov/air-quality/permitting-section-home-page/. The regulation dealing with public participation in the permit review process is 20.2.72.206 NMAC.

Attención
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Affidavit of Publication

STATE OF NEW MEXICO
COUNTY OF LEA

I, Daniel Russell, Publisher of the Hobbs News-Sun, a newspaper published at Hobbs, New Mexico, solemnly swear that the clipping attached hereto was published in the regular and entire issue of said newspaper, and not a supplement thereof for a period of 1 issue(s).

Beginning with the issue dated
May 05, 2024
and ending with the issue dated
May 05, 2024.

Publisher

Sworn and subscribed to before me this 5th day of May 2024.

Business Manager

My commission expires
January 29, 2027
(Seal)

STATE OF NEW MEXICO
NOTARY PUBLIC
GUSSIE RUTH BLACK
COMMISSION # 1087526
COMMISSION EXPIRES 01/29/2027

This newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Laws of 1937 and payment of fees for said publication has been made.

NOTICE OF AIR QUALITY PERMIT APPLICA

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Attención
Este es un aviso de la oficina de Calidad del Aire del Departamento del Medio Am México, acerca de las emisiones producidas por un establecimiento en esta área información en español, por favor comuníquese con esa oficina al teléfono 505-

Affidavit of Publicatio

STATE OF NEW MEXICO
COUNTY OF LEA

I, Daniel Russell, Publisher of the Hobbs News-Sun, a newspaper published at Hobbs, New Mexico, solemnly swear that the clipping attached hereto was publishe in the regular and entire issue of said newspaper, and not a supplement thereo for a period of 1 issue(s).

Beginning with the issue dated
May 05, 2024
and ending with the issue dated
May 05, 2024.

Publisher

Sworn and subscribed to before me this 5th day of May 2024.

Business Manager

My commission expires
January 29, 2027

(Seal) STATE OF NEW MEXICO
NOTARY PUBLIC
GUSSIE RUTH BLACK
COMMISSION # 1087526
COMMISSION EXPIRES 01/29/2027

This newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Laws of 1937 and payment of fees for said publication has been made.

LEGAL NOTICE
May 5, 2024

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Volatile Organic Compounds (VOC)	1768.0 pph	128.5 tpy
Total sum of all Hazardous Air Pollutants (HAPs)	60.5 pph	20.0 tpy
Green House Gas Emissions as Total CO_2e	n/a	296,463.0 tpy

The standard and maximum operating schedules of the facility will be from 12:00 a.m. to 11:59 p.m. 7 days a week and a maximum of 52 weeks per year.

The owner and/or operator of the Facility is:
Delaware G&P, LLC
1722 Routh Street, Suite 1300
Dallas, TX 75201

If you have any comments about the construction or operation of this facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to this address: Permit Programs Manager; New Mexico Environment Department; Air Quality Bureau; 525 Camino de los Marquez, Suite 1; Santa Fe, New Mexico; 87505-1816. Other comments and questions may be submitted verbally. (505) 476-4300; 1 800 224-7009.

Please refer to the company name and site name, or send a copy of this notice along with your comments, since the Department may have not yet received the permit application. Please include a legible return mailing address with your comments. Once the Department has performed a preliminary review of the application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location.

General information about air quality and the permitting process, and links to the regulations can be found at the Air Quality Bureau's website: www.env.nm.gov/air-quality/permitting-section-home-page/. The regulation dealing with public participation in the permit review process is 20.2.72.206 NMAC.

Atención
Este es un aviso de la oficina de Calidad del Aire del Departamento del Medio Ambiente de Nuevo México, acerca de las emisiones producidas por un establecimiento en esta área. Si usted desea información en español, por favor comuníquese con esa oficina al teléfono 505-629-3395.

Notice of Non-Discrimination
NMED does not discriminate on the basis of race, color, national origin, disability, age or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Part 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this notice or any of NMED's non-discrimination programs, policies or procedures, or if you believe that you have been discriminated against with respect to a NMED program or activity, you may contact: Non-Discrimination Coordinator, NMED, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@env.nm.gov. You may also visit our website at https://www.env.nm.gov/non-employee-discrimination-complaint-page/ to learn how and where to file a complaint of discrimination.
#00290064

67116752 00290064

JEFF JACKSON
RESOLUTE COMPLIANCE, LLC
PO BOX 970
ROYSE CITY, TX 75189

Leslee Kimbrell

From: Leslee Kimbrell
Sent: Tuesday, May 7, 2024 11:16 AM
To: aaron@1radiosquare.com
Cc: Lance Green; Daria Underwood; Jeff Jackson; Kayla Curtis
Subject: Public Service Announcement

To Whom It May Concern,

Delaware G&P, LLC (EnLink) requests a public service announcement on KZOR Radio, for its intention to modify a compressor station in Lea County. The State of New Mexico requires that any company that desires to construct or modify an oil and gas facility must have a public service announcement. EnLink has written out the following to be aired as soon as practical:

"Delaware G&P, LLC is an oil and gas gathering company planning to modify and operate the Horned Frog Compressor Station in Lea County. The location for the proposed facility will be at latitude 32 degrees, 4 minutes, 59.1 seconds and longitude -103 degrees, 35 minutes, 17.02 seconds. The approximate location of this facility is 23.5 miles Southwest of Jal in Lea County. More information about this facility can be found at the Woolworth Community Library, Jal City Hall, and the Post Office on 111 S 4th St. in Jal. For any comments about the construction or operation of the proposed facility, the New Mexico Air Quality Bureau can be contacted by phone at (505) 476-4300 or by mail at 525 Camino de los Marquez, Suite 1, Santa Fe, New Mexico 87505-1816."

Please respond to this email and provide an electronic version of the affidavit immediately after airing this announcement. You can also reply to this email with the invoice.

Thank you,

Leslee Kimbrell
Senior Environmental Specialist

RESOLUTE COMPLIANCE, LLC
Purposeful Solutions. Unwavering Service.
115 FM 2453, Suite A | Royse City, TX 75189
Cell: 505.369.6572
Email: lk@resolutecompliance.com

Submittal of Public Service Announcement – Certification

I, __Jeff Jackson____, the undersigned, certify that on **May 7, 2024**, submitted a public service announcement to **KZOR FM Station** that serves the town of **Jal**, **Lea** County, New Mexico, in which the source is or is proposed to be located and that **KZOR RESPONDED THAT IT WOULD AIR THE ANNOUNCEMENT.**

Signed this ____ day of _____, _____,

_____ _____
Signature Date

___Jeff Jackson_____
Printed Name

__Consultant to Delaware G&P LLC_____
Title {APPLICANT OR RELATIONSHIP TO APPLICANT}

Section 10

Written Description of the Routine Operations of the Facility

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A written description of the routine operations of the facility. Include a description of how each piece of equipment will be operated, how controls will be used, and the fate of both the products and waste generated. For modifications and/or revisions, explain how the changes will affect the existing process. In a separate paragraph describe the major process bottlenecks that limit production. The purpose of this description is to provide sufficient information about plant operations for the permit writer to determine appropriate emission sources.

The Facility receives natural gas from natural gas wells located in Lea County and adjacent countries through a network of gathering pipelines. The inlet natural gas enters the Facility and is routed to an inlet separator where liquids are separated. The condensate and produced water are routed to one (1) 750 bbl gunbarrel separator (Source ID GB-1). Condensate is then routed to six (6) 400 bbl condensate tanks (Source IDs TK-1, TK-2, TK-3, TK-5, TK-6, TK-7). Produced water is transferred to the two (2) 400 bbl produced water tanks (Source IDs TK-4, TK-8). The condensate and produced water tank emissions are 98% captured by a vapor recovery unit (VRU) which is routed to an enclosed combustor device (ECD) during 5% VRU downtime. Uncaptured emissions are vented from the tanks. Liquids collected in the tanks are periodically transported off-site via truck (Source IDs CONDLOAD and PWLOAD). Emissions from truck loading are routed back to VRU and routed to the ECD during VRU downtime. From the inlet separator, gas is routed to nine (9) compressor engines (Source IDs E-1, E-2, E-4, E-5, E-6, E-7, E-8, E-9, E-10).

The following engine options for Unit E-9 and E-10 are being requested. The worst-case emissions per pollutant are represented in all emission tables.

Unit #	Description	HP
E-9a	Caterpillar G3608 A4	2500
E-9b	Waukesha P9394GSI S5	2500
E-10a	Caterpillar G3612 A4	3750
E-10b	Waukesha 12V275GL	3750

The compressed gas is routed to two (2) glycol dehydration units (Source IDs DEHY1, DEHY2), which remove water from the gas through contact with glycol. The rich glycol (water saturated) is routed to the reboilers (Source ID H-1, H-2), which heats the glycol and vaporizes water from the stream. The lean glycol is then recycled back to the dehydration units. The dehydration units are equipped with a flash tank and condenser. Flash gas is captured 98% by the VRU with 5% routed to the ECD with a 98% DRE. Uncaptured emissions are vented from the Dehys. Emissions from the regenerator still vent are controlled by a BTEX condenser and remaining gas is controlled by the reboiler glow plug for a total control efficiency of 98%. The dry gas is transported off-site via pipeline.

Two (2) natural gas-fired generator engines (Source IDs GEN-4, GEN-5) supply electricity to the Facility. Additional sources of emissions include fugitive components (Source ID FUG), unpaved road dust (Source ID UR-01), and start-up, shutdown, maintenance operations (Source ID SSM).

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Section 11

Source Determination

Source submitting under 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC

Sources applying for a construction permit, PSD permit, or operating permit shall evaluate surrounding and/or associated sources (including those sources directly connected to this source for business reasons) and complete this section. Responses to the following questions shall be consistent with the Air Quality Bureau's permitting guidance, Single Source Determination Guidance, which may be found on the Applications Page in the Permitting Section of the Air Quality Bureau website.

Typically, buildings, structures, installations, or facilities that have the same SIC code, that are under common ownership or control, and that are contiguous or adjacent constitute a single stationary source for 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC applicability purposes. Submission of your analysis of these factors in support of the responses below is optional, unless requested by NMED.

A. Identify the emission sources evaluated in this section (list and describe)**:**
All sources listed in Table 2-A of this application.

B. Apply the 3 criteria for determining a single source:

SIC Code: Surrounding or associated sources belong to the same 2-digit industrial grouping (2-digit SIC code) as this facility OR surrounding or associated sources that belong to different 2-digit SIC codes are support facilities for this source.

☒ **Yes** ☐ **No**

Common Ownership or Control: Surrounding or associated sources are under common ownership or control as this source.

☐ **Yes** ☒ **No**

Contiguous or Adjacent: Surrounding or associated sources are contiguous or adjacent with this source.

☐ **Yes** ☒ **No**

C. Make a determination:

☒ The source, as described in this application, constitutes the entire source for 20.2.70, 20.2.72, 20.2.73, or 20.2.74 NMAC applicability purposes. If in "A" above you evaluated only the source that is the subject of this application, all "**YES**" boxes should be checked. If in "A" above you evaluated other sources as well, you must check **AT LEAST ONE** of the boxes "**NO**" to conclude that the source, as described in the application, is the entire source for 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC applicability purposes.

☐ The source, as described in this application, **does not** constitute the entire source for 20.2.70, 20.2.72, 20.2.73, or 20.2.74 NMAC applicability purposes (A permit may be issued for a portion of a source). The entire source consists of the following facilities or emissions sources (list and describe):

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Section 12

Section 12.A

PSD Applicability Determination for All Sources

(Submitting under 20.2.72, 20.2.74 NMAC)

A PSD applicability determination for all sources. For sources applying for a significant permit revision, apply the applicable requirements of 20.2.74.AG and 20.2.74.200 NMAC and to determine whether this facility is a major or minor PSD source, and whether this modification is a major or a minor PSD modification. It may be helpful to refer to the procedures for Determining the Net Emissions Change at a Source as specified by Table A-5 (Page A.45) of the EPA New Source Review Workshop Manual to determine if the revision is subject to PSD review.

A. This facility is:

- ☐ **a minor PSD source before and after this modification (if so, delete C and D below).**
- ☐ **a major PSD source before this modification. This modification will make this a PSD minor source.**
- ☐ **an existing PSD Major Source that has never had a major modification requiring a BACT analysis.**
- ☐ **an existing PSD Major Source that has had a major modification requiring a BACT analysis**
- ☐ **a new PSD Major Source after this modification.**

N/A – This application is being submitted under 20.2.70.300.A.(2) NMAC.

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Section 13

Determination of State & Federal Air Quality Regulations

This section lists each state and federal air quality regulation that may apply to your facility and/or equipment that are stationary sources of regulated air pollutants.

Not all state and federal air quality regulations are included in this list. Go to the Code of Federal Regulations (CFR) or to the Air Quality Bureau's regulation page to see the full set of air quality regulations.

Required Information for Specific Equipment:
For regulations that apply to specific source types, in the 'Justification' column **provide any information needed to determine if the regulation does or does not apply**. **For example**, to determine if emissions standards at 40 CFR 60, Subpart IIII apply to your three identical stationary engines, we need to know the construction date as defined in that regulation; the manufacturer date; the date of reconstruction or modification, if any; if they are or are not fire pump engines; if they are or are not emergency engines as defined in that regulation; their site ratings; and the cylinder displacement.

Required Information for Regulations that Apply to the Entire Facility:
See instructions in the 'Justification' column for the information that is needed to determine if an 'Entire Facility' type of regulation applies (e.g. 20.2.70 or 20.2.73 NMAC).

Regulatory Citations for Regulations That Do Not, but Could Apply:
If there is a state or federal air quality regulation that does not apply, but you have a piece of equipment in a source category for which a regulation has been promulgated, you must **provide the low level regulatory citation showing why your piece of equipment is not subject to or exempt from the regulation. For example** if you have a stationary internal combustion engine that is not subject to 40 CFR 63, Subpart ZZZZ because it is an existing 2 stroke lean burn stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, your citation would be 40 CFR 63.6590(b)(3)(i). **We don't want a discussion of every non-applicable regulation, but if it is possible a regulation could apply, explain why it does not. For example,** if your facility is a power plant, you do not need to include a citation to show that 40 CFR 60, Subpart OOO does not apply to your non-existent rock crusher.

Regulatory Citations for Emission Standards:
For each unit that is subject to an emission standard in a source specific regulation, such as 40 CFR 60, Subpart OOO or 40 CFR 63, Subpart HH, include the low level regulatory citation of that emission standard. Emission standards can be numerical emission limits, work practice standards, or other requirements such as maintenance. **Here are examples:** a glycol dehydrator is subject to the general standards at 63.764C(1)(i) through (iii); an engine is subject to 63.6601, Tables 2a and 2b; a crusher is subject to 60.672(b), Table 3 and all transfer points are subject to 60.672(e)(1)

Federally Enforceable Conditions:
All federal regulations are federally enforceable. All Air Quality Bureau State regulations are federally enforceable except for the following: affirmative defense portions at 20.2.7.6.B, 20.2.7.110(B)(15), 20.2.7.11 through 20.2.7.113, 20.2.7.115, and 20.2.7.116; 20.2.37; 20.2.42; 20.2.43; 20.2.62; 20.2.63; 20.2.86; 20.2.89; and 20.2.90 NMAC. Federally enforceable means that EPA can enforce the regulation as well as the Air Quality Bureau and federally enforceable regulations can count toward determining a facility's potential to emit (PTE) for the Title V, PSD, and nonattainment permit regulations.

INCLUDE ANY OTHER INFORMATION NEEDED TO COMPLETE AN APPLICABILITY DETERMINATION OR THAT IS RELEVENT TO YOUR FACILITY'S NOTICE OF INTENT OR PERMIT.

EPA Applicability Determination Index for 40 CFR 60, 61, 63, etc: http://cfpub.epa.gov/adi/

Example of a Table for State Regulations:

State Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification: (You may delete instructions or statements that do not apply in the justification column to shorten the document.)
20.2.1 NMAC	General Provisions	Yes	Facility	General Provisions apply to Notice of Intent, Construction, and Title V permit applications.
20.2.3 NMAC	Ambient Air Quality Standards NMAAQS	Yes	Facility	20.2.3 NMAC is a State Implementation Plan (SIP) approved regulation that limits the maximum allowable concentration of, Sulfur Compounds, Carbon Monoxide and Nitrogen Dioxide. The TSP NM ambient air quality standard was repealed by the EIB effective November 30, 2018.
20.2.7 NMAC	Excess Emissions	Yes	Facility	This regulation establishes requirements for the facility if operations at the facility result in any excess emissions. The owner or operator will operate the source at the facility having an excess emission, to the extent practicable, including associated air pollution control equipment, in a manner consistent with good air pollution control practices for minimizing emissions. The facility will also notify the NMED of any excess emission per 20.2.7.110 NMAC.
20.2.23 NMAC	Fugitive Dust Control	No	N/A	This regulation does not apply because this application is not for a Notice of Intent.
20.2.33 NMAC	Gas Burning Equipment - Nitrogen Dioxide	No	N/A	This facility does not have gas burning equipment having a heat input of greater than 1,000,000 million British Thermal Units per year per unit; therefore, this regulation does not apply.
20.2.34 NMAC	Oil Burning Equipment: NO_2	No	N/A	This facility does not have oil burning equipment having a heat input of greater than 1,000,000 million British Thermal Units per year per unit; therefore, this unit does not apply.
20.2.35 NMAC	Natural Gas Processing Plant – Sulfur	No	N/A	This facility does not meet the definition of a natural gas processing plant; therefore, this regulation does not apply.
20.2.37 and 20.2.36 NMAC	Petroleum Processing Facilities and Petroleum Refineries	N/A	N/A	**These regulations were repealed by the Environmental Improvement Board. If you had equipment subject to 20.2.37 NMAC before the repeal, your combustion emission sources are now subject to 20.2.61 NMAC.**
20.2.38 NMAC	Hydrocarbon Storage Facility	Yes	TK-1 thru TK-8	The storage vessels have a capacity greater than 20,000 gallons; therefore, this regulation is subject.
20.2.39 NMAC	Sulfur Recovery Plant - Sulfur	No	N/A	This facility does not meet the definition of a sulfur recovery plant; therefore, this regulation does not apply.
20.2.50 NMAC	Oil and Gas Sector – Ozone Precursor Pollutants	Yes	E-1, E-2, E-4 thru E-10, VRU, ECD-1, FUG, DEHY1, DEHY2	This regulation establishes emission standards for volatile organic compounds (VOC) and oxides of nitrogen (NOx) for oil and gas production, processing, compression, and transmission sources. 20.2.50 NMAC subparts below: Include the construction status of applicable units as “New”, “Existing”, “Relocation of Existing”, or “Reconstructed” as defined by this Part in your justification: Check the box for the subparts that are applicable: ☒113 – Engines and Turbines: E-1, E-2, E-4-E-10 are existing, and existing relocated. GEN-4 and GEN-5 are existing less than 1000 hp ☒114 – Compressor Seals: Reciprocating compressors for E-1, E-2, E-4-E-10 ☒115 – Control Devices and Closed Vent Systems: VRU, ECD-1 ☒116 – Equipment Leaks and Fugitive Emissions: FUG ☐ 117 – Natural Gas Well Liquid Unloading ☒ 118 – Glycol Dehydrators: DEHY1 DEHY2 are controlled 95% by the VRU and 98% by the ECD ☐ 119 – Heaters: H-1 & H-2 are <20 MMBTU/Hr ☐ 120 – Hydrocarbon Liquid Transfers

State Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification: (You may delete instructions or statements that do not apply in the justification column to shorten the document.)
				☐121 – Pig Launching and Receiving ☐122 – Pneumatic Controllers and Pumps ☐ 123 – Storage Vessels: TK-1 thru TK-8 are existing with a PTE <3tpy ☐124 – Well Workovers ☐ 125 – Small Business Facilities ☐126 – Produced Water Management Unit ☐127 – Flowback Vessels and Preproduction Operations
20.2.61.109 NMAC	Smoke & Visible Emissions	Yes	E-1, E-2, E-4 thru E-10 GEN-4, GEN-5, H-1, H-2 ECD-1	This regulation that limits opacity to 20% applies to Stationary Combustion Equipment, such as engines, boilers, heaters, and flares unless your equipment is subject to another state regulation that limits particulate matter such as 20.2.19 NMAC (see 20.2.61.109 NMAC). **If equipment at your facility was subject to the repealed regulation 20.2.37 NMAC it is now subject to 20.2.61 NMAC.**
20.2.70 NMAC	Operating Permits	Yes	Facility	The facility has the potential to emit more than 100 tpy of carbon monoxide and VOCs; therefore, this regulation is subject.
20.2.71 NMAC	Operating Permit Fees	Yes	Facility	This facility is subject to 20.2.70 NMAC; therefore, this regulation is subject.
20.2.72 NMAC	Construction Permits	Yes	Facility	This facility is subject to 20.2.72 NMAC.
20.2.73 NMAC	NOI & Emissions Inventory Requirements	Yes	Facility	This regulation establishes emission inventory requirements. The facility meets the applicability requirements of 20.2.73.300 NMAC. The facility will meet all applicable reporting requirements under 20.2.73.300.B.1 NMAC.
20.2.74 NMAC	Permits – Prevention of Significant Deterioration (PSD)	No	Facility	This facility is not a PSD source; therefore, this regulation does not apply.
20.2.75 NMAC	Construction Permit Fees	Yes	Facility	This facility is subject to 20.2.72 NMAC; therefore, this regulation applies.
20.2.77 NMAC	New Source Performance	Yes	FUG, E-1, E-2, E-4 through E-10	This regulation establishes state authority to implement new source performance standards (NSPS) for stationary sources, as amended through January 15, 2017. FUG are subject to NSPS OOOOa, and Units E-1, E-2, E-4 through E-10 are subject to NSPS JJJJ.
20.2.78 NMAC	Emission Standards for HAPS	No	N/A	This regulation establishes state authority to implement emission standards for hazardous air pollutants subject to 40 CFR Part 61. This facility does not emit hazardous air pollutants which are subject to the requirements of 40 CFR Part 61 and is therefore not subject to this regulation
20.2.79 NMAC	Permits – Nonattainment Areas	No	Facility	This regulation establishes the requirements for obtaining a nonattainment area permit. The facility is not located in a non-attainment area and therefore is not subject to this regulation.

State Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification: (You may delete instructions or statements that do not apply in the justification column to shorten the document.)
20.2.80 NMAC	Stack Heights	No	N/A	This regulation establishes requirements for the evaluation of stack heights and other dispersion techniques. This regulation does not apply, as all stacks at the facility will follow good engineering practice.
20.2.82 NMAC	MACT Standards for source categories of HAPS	Yes	DEHY1, DEHY2 E-1, E-2, E-4 through E-10, GEN-4, GEN-5	This regulation applies to all sources emitting hazardous air pollutants, which are subject to the requirements of 40 CFR Part 63.

Example of a Table for Applicable Federal Regulations (Note: This is not an exhaustive list):

Federal Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification:
40 CFR 50	NAAQS	Yes	Facility	This regulation defines national ambient air quality standards. The facility meets all applicable national ambient air quality standards for NOx, CO, SO2, H2S, PM10, and PM2.5 under this regulation.
NSPS 40 CFR 60, Subpart A	General Provisions	Yes	E-1, E-2, E-4 through E-10, GEN-4, GEN-5 FUG	This regulation defines general provisions for relevant standards that have been set under this part. The facility is subject to this regulation because the following subparts apply: - Units E-1, E-2, E-4 through E-10, GEN-4, GEN-5 are subject to NSPS JJJJ. - Unit FUG is subject to NSPS OOOOa - Units E-4 through E-10, FUG, TK-1 through TK-8 are potentially subject to OOOOb.
NSPS 40 CFR60.40a, Subpart Da	Subpart Da, Performance Standards for **Electric Utility Steam Generating Units**	No	N/A	There are no electric utility steam generating units located at this facility; therefore, the facility is not subject to this regulation.
NSPS 40 CFR60.40b Subpart Db	**Electric Utility Steam Generating Units**	No	N/A	There are no electric utility steam generating units located at this facility; therefore, the facility is not subject to this regulation.
40 CFR 60.40c, Subpart Dc	Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units	No	N/A	There are no small industrial commercial institutional steam generating units located at this facility; therefore, the facility is not subject to this regulation.

Federal Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification:
NSPS 40 CFR 60, Subpart Ka	Standards of Performance for **Storage Vessels for Petroleum Liquids** for which Construction, Reconstruction, or Modification Commenced After May 18, 1978, and **Prior** to July 23, 1984	Yes	TK-1 thru TK-8	Tanks TK-1 through TK-8 have a storage capacity greater than 151,416 liters (40,000 gallons) that are used to store petroleum liquids for which construction commenced after May 18, 1978.
NSPS 40 CFR 60, Subpart Kb	Standards of Performance for **Volatile Organic Liquid Storage Vessels** (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced **After** July 23, 1984	No	TK-1 thru TK-8	TK-1 through TK-8 were constructed after July 23, 1984 but are not subject because they store "Petroleum (other than crude oil) or condensate stored, processed, and/or treated prior to custody transfer" and are less than 420,000-gal capacity (10,000-bbl) per §60.110b(d)(4).
NSPS 40 CFR 60.330 Subpart GG	**Stationary Gas Turbines**	No	N/A	There are no turbines located at this facility; therefore, this regulation does not apply.
NSPS 40 CFR 60, Subpart KKK	Leaks of VOC from **Onshore Gas Plants**	No	N/A	This is not a natural gas processing plant; therefore, this regulation does not apply.
NSPS 40 CFR Part 60 Subpart LLL	Standards of Performance for **Onshore Natural Gas Processing**: SO_2 Emissions	No	N/A	This is not a natural gas processing plant; therefore, this regulation does not apply.
NSPS 40 CFR 60 Subpart IIII	Standards of performance for Stationary Compression Ignition Internal Combustion Engines	No	N/A	This facility does not have any compression internal combustion engines. Thus, it is not subject to this regulation.
NSPS 40 CFR Part 60 Subpart JJJJ	Standards of Performance for Stationary Spark Ignition Internal Combustion Engines	Yes	E-1, E-2, E-4 through E-10, GEN-4, GEN-5	E-1, E-2, E-4 through E-10, GEN-4, GEN-5 are manufactured after June 12, 2006, and have maximum engine power greater than 500 HP, therefore are subject to this subpart.
NSPS 40 CFR Part 60 Subpart OOOO	Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution for	No	N/A	The facility was constructed after September 18, 2015.

Federal Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification:
	which construction, modification or reconstruction commenced after August 23, 2011 and before September 18, 2015			
NSPS 40 CFR Part 60 Subpart OOOOa	Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015	Yes	E-1, E-2, E-4 through E-10, FUG	Standards apply to storage vessels constructed, modified or reconstructed after September 18, 2015, with VOC emissions equal to or greater than 6 tons per year (TPY). Storage tank TK-1 through TK-8 VOC emissions are less than 6 TPY. Therefore; the storage tanks are not subject to the requirements of this rule. Reciprocating compressors for E-1, E-2, E-4 through E-10 manufactured after September 18, 2015 will comply with this rule accordingly. Pneumatic controllers installed at the Station after September 18, 2015 will operate at a natural gas bleed rate less than 6 standard cubic feet per hour (SCFH). Delaware G&P will prepare a fugitive monitoring plan and will conduct fugitive monitoring as required by this rule. Additionally, the VRU will comply with 60.5411a.
NSPS 40 CFR Part 60 Subpart OOOOb	Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After November 15, 2021	Yes	E-4 through E-10, FUG, TK-1 through TK-8	The facility is a natural gas compressor station constructed or modified after November 15, 2021, therefore the compressors associated with E-4 through E-10, fugitives, and TK-1 through TK-8 are potentially affected sources under this subpart and will comply with all applicable requirements.
NSPS 40 CFR 60 Subpart TTTT	Standards of Performance for Greenhouse Gas Emissions for Electric Generating Units	No	N/A	This facility does not have any steam generating units and is therefore not subject to this regulation.
NSPS 40 CFR 60 Subpart UUUU	Emissions Guidelines for Greenhouse Gas Emissions and Compliance Times for Electric Utility Generating Units	No	N/A	This facility does not operate any sources that are applicable to this subpart.
NSPS 40 CFR 60, Subparts WWW, XXX, Cc, and Cf	Standards of performance for Municipal Solid Waste (MSW) Landfills	No	N/A	This facility is not a municipal solid waste landfill and is therefore not subject to this regulation.
NESHAP 40 CFR 61 Subpart A	General Provisions	No	N/A	This facility is not subject to any subparts of 40 CFR 61.
NESHAP 40 CFR 61 Subpart E	National Emission Standards for **Mercury**	No	N/A	The provisions of this subpart are applicable to those stationary sources which process mercury ore to recover mercury, use mercury chlor-alkali cells to produce chlorine gas and alkali metal hydroxide, and incinerate or dry wastewater treatment plant sludge

Federal Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification:
NESHAP 40 CFR 61 Subpart V	National Emission Standards for **Equipment Leaks** (Fugitive Emission Sources)	No	N/A	Not applicable as the facility equipment does not operate in VHAP service. VHAP service is a piece of equipment, which contains or encounters a fluid that is at least 10% weight of VHAP. VHAP is a substance regulated under this subpart for which a standard for equipment leaks of VHAPs has been promulgated
MACT 40 CFR 63, Subpart A	General Provisions	Yes	E-1, E-2, E-4 through E-10, GEN-4, GEN-5	Applies if any other Subpart in 40 CFR 63 applies.
MACT 40 CFR 63.760 Subpart HH	**Oil and Natural Gas Production Facilities**	Yes	DEHY1, DEHY2	The dehydrators (Unit DEHY1, DEHY2) are located at an area source of HAPS and have the potential to emit less than 1 tpy (0.90 megagram per year) of benzene. Therefore, it is subject to the operating and recordkeeping requirements of §63.764(e)(1)(ii).
MACT 40 CFR 63 Subpart HHH		No	N/A	This facility is not a natural gas transmission or storage facility; therefore, this subpart does not apply.
MACT 40 CFR 63 Subpart DDDDD	National Emission Standards for Hazardous Air Pollutants for Major Industrial, Commercial, and Institutional Boilers & Process Heaters	No	N/A	RBL-1 is a process heater that is located at a facility that is not a major source of HAPs; therefore, this subpart will apply.
MACT 40 CFR 63 Subpart UUUUU	National Emission Standards for Hazardous Air Pollutants Coal & Oil Fire Electric Utility Steam Generating Unit	No	N/A	This facility does not contain a coal or oil fire electric utility steam generating units; therefore, this regulation does not apply.
MACT 40 CFR 63 Subpart ZZZZ	National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (**RICE MACT**)	Yes	E-1, E-2, E-4 through E-10, GEN-4, GEN-5	E-1, E-2, E-4 through E-10, GEN-4, GEN-5 are stationary internal combustion engines that are operated at an area source of HAPs; therefore, these engines are subject to this subpart.
40 CFR 64	**Compliance Assurance Monitoring**	No	N/A	This facility is submitting an application pursuant of 20.2.72.200A.(1) NMAC for an NSR permit. Thus, this regulation does not apply.
40 CFR 68	**Chemical Accident Prevention**	No	Facility	The facility does not have a threshold quantity of a regulated substance in a process, as determined under §68.115; therefore, this regulation is not subject.
Title IV – Acid Rain 40 CFR 72	**Acid Rain**	No	N/A	This facility is not an acid rain source; therefore, this regulation is not subject.

Federal Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification:
Title IV – Acid Rain 40 CFR 73	**Sulfur Dioxide** Allowance Emissions	No	N/A	This facility is not an acid rain source; therefore, this regulation is not subject.
Title IV-Acid Rain 40 CFR 75	**Continuous Emissions Monitoring**	No	N/A	This facility does not generate commercial electric power or electric power for sale and is therefore not subject to this regulation.
Title IV – Acid Rain 40 CFR 76	**Acid Rain** Nitrogen Oxides **Emission Reduction Program**	No	N/A	This facility is not an acid rain source; therefore, this regulation is not subject.
Title VI – 40 CFR 82	Protection of **Stratospheric Ozone**	No	N/A	This facility will have appliances containing CFCs. The owner will use only certified technicians for the maintenance, service, repair and disposal of appliances to comply with this regulation.

Section 14

Operational Plan to Mitigate Emissions

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

☐ **Title V Sources** (20.2.70 NMAC)**:** By checking this box and certifying this application the permittee certifies that it has developed an **Operational Plan to Mitigate Emissions During Startups, Shutdowns, and Emergencies** defining the measures to be taken to mitigate source emissions during startups, shutdowns, and emergencies as required by 20.2.70.300.D.5(f) and (g) NMAC. This plan shall be kept on site to be made available to the Department upon request. This plan should not be submitted with this application.

☒ **NSR** (20.2.72 NMAC)**, PSD** (20.2.74 NMAC) **& Nonattainment** (20.2.79 NMAC) **Sources:** By checking this box and certifying this application the permittee certifies that it has developed an **Operational Plan to Mitigate Source Emissions During Malfunction, Startup, or Shutdown** defining the measures to be taken to mitigate source emissions during malfunction, startup, or shutdown as required by 20.2.72.203.A.5 NMAC. This plan shall be kept on site to be made available to the Department upon request. This plan should not be submitted with this application.

☒ **Title V** (20.2.70 NMAC)**, NSR** (20.2.72 NMAC)**, PSD** (20.2.74 NMAC) **& Nonattainment** (20.2.79 NMAC) **Sources:** By checking this box and certifying this application the permittee certifies that it has established and implemented a Plan to Minimize Emissions During Routine or Predictable Startup, Shutdown, and Scheduled Maintenance through work practice standards and good air pollution control practices as required by 20.2.7.14.A and B NMAC. This plan shall be kept on site or at the nearest field office to be made available to the Department upon request. This plan should not be submitted with this application.

Startup and shutdown procedures are either based on manufacturer's recommendations or based on Delaware G&P's experience with specific equipment. These procedures are designed to proactively address the potential for malfunction to minimize emissions from the facility during events that result in shutdown and subsequent startup.

Equipment located at this facility is equipped with various safety devices and features that aid in the prevention of excess emissions in the event of an operational emergency. If an operational emergency does occur and excess emissions occur, Delaware G&P will submit the required Excess Emissions Report as per 20.2.7 NMAC. Corrective action to eliminate the excess emissions and prevent recurrence in the future will be undertaken as quickly as safety allows.

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Section 15

Alternative Operating Scenarios

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

Alternative Operating Scenarios: Provide all information required by the department to define alternative operating scenarios. This includes process, material and product changes; facility emissions information; air pollution control equipment requirements; any applicable requirements; monitoring, recordkeeping, and reporting requirements; and compliance certification requirements. Please ensure applicable Tables in this application are clearly marked to show alternative operating scenario.

Construction Scenarios: When a permit is modified authorizing new construction to an existing facility, NMED includes a condition to clearly address which permit condition(s) (from the previous permit and the new permit) govern during the interval between the date of issuance of the modification permit and the completion of construction of the modification(s). There are many possible variables that need to be addressed such as: Is simultaneous operation of the old and new units permitted and, if so for example, for how long and under what restraints? In general, these types of requirements will be addressed in Section A100 of the permit, but additional requirements may be added elsewhere. Look in A100 of our NSR and/or TV permit template for sample language dealing with these requirements. Find these permit templates at: www.env.nm.gov/air-quality/permitting-section-procedures-and-guidance/. Compliance with standards must be maintained during construction, which should not usually be a problem unless simultaneous operation of old and new equipment is requested.

In this section, under the bolded title “Construction Scenarios”, specify any information necessary to write these conditions, such as: conservative-realistic estimated time for completion of construction of the various units, whether simultaneous operation of old and new units is being requested (and, if so, modeled), whether the old units will be removed or decommissioned, any PSD ramifications, any temporary limits requested during phased construction, whether any increase in emissions is being requested as SSM emissions or will instead be handled as a separate Construction Scenario (with corresponding emission limits and conditions, etc.

There are no alternative operating scenarios.

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Section 16

Air Dispersion Modeling

1) Minor Source Construction (20.2.72 NMAC) and Prevention of Significant Deterioration (PSD) (20.2.74 NMAC) ambient impact analysis (modeling): Provide an ambient impact analysis as required at 20.2.72.203.A(4) and/or 20.2.74.303 NMAC and as outlined in the Air Quality Bureau's Dispersion Modeling Guidelines found on the Planning Section's modeling website. If air dispersion modeling has been waived for one or more pollutants, attach the AQB Modeling Section modeling waiver approval documentation.
2) SSM Modeling: Applicants must conduct dispersion modeling for the total short term emissions during routine or predictable startup, shutdown, or maintenance (SSM) using realistic worst case scenarios following guidance from the Air Quality Bureau's dispersion modeling section. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.env.nm.gov/aqb/permit/app_form.html) for more detailed instructions on SSM emissions modeling requirements.
3) Title V (20.2.70 NMAC) ambient impact analysis: Title V applications must specify the construction permit and/or Title V Permit number(s) for which air quality dispersion modeling was last approved. Facilities that have only a Title V permit, such as landfills and air curtain incinerators, are subject to the same modeling required for preconstruction permits required by 20.2.72 and 20.2.74 NMAC.

What is the purpose of this application?	Enter an X for each purpose that applies
New PSD major source or PSD major modification (20.2.74 NMAC). See #1 above.	
New Minor Source or significant permit revision under 20.2.72 NMAC (20.2.72.219.D NMAC). See #1 above. **Note:** Neither modeling nor a modeling waiver is required for VOC emissions.	X
Reporting existing pollutants that were not previously reported.	
Reporting existing pollutants where the ambient impact is being addressed for the first time.	
Title V application (new, renewal, significant, or minor modification. 20.2.70 NMAC). See #3 above.	
Relocation (20.2.72.202.B.4 or 72.202.D.3.c NMAC)	
Minor Source Technical Permit Revision 20.2.72.219.B.1.d.vi NMAC for like-kind unit replacements.	
Other: i.e. SSM modeling. See #2 above.	
This application does not require modeling since this is a No Permit Required (NPR) application.	
This application does not require modeling since this is a Notice of Intent (NOI) application (20.2.73 NMAC).	
This application does not require modeling according to 20.2.70.7.E(11), 20.2.72.203.A(4), 20.2.74.303, 20.2.79.109.D NMAC and in accordance with the Air Quality Bureau's Modeling Guidelines.	

Check each box that applies:

☐ See attached, approved modeling **waiver for all** pollutants from the facility.

☐ See attached, approved modeling **waiver for some** pollutants from the facility.

☒ Attached in Universal Application Form 4 (UA4) is a **modeling report for all** pollutants from the facility.

☐ Attached in UA4 is a **modeling report for some** pollutants from the facility.

☐ No modeling is required.

Air Dispersion Modeling Summary for Permit No. 7868

Facility Identification:
Project: Horned Frog Compressor Station
Company: Delaware G&P, LLC
Permit number: 7868M5
TEMPO ID: 38473

Location Information:
The facility is located 23 miles West of Jal, in Lea County.
UTM Coordinates: 633,250.70 m East, 3,550,517.38 m North, zone 13, Datum: NAD83
(32.083086, -103.588061)
Elevation = 3,281 feet
Air Quality Control Region (AQCR): 155
Airshed: Pr

Project Description:
Brief: Delaware G&P, LLC has applied to the New Mexico Air Quality Bureau for a New Source Review air quality permit for the authorization of the Horned Frog Compressor Station facility (the facility). The facility is a compressor station.

Delaware G&P, LLC seeks to authorize a facility throughput of 120 MMSCFD of natural gas, the operation of two (2) CAT G3516B compressor engines (E-1, E-2), one (1) CAT G3606 A4 (E-4) compressor engine, five (5) Waukesha P9394GSI S5 compressor engines, one (1) CAT G3612 A4 compressor engine, two (2) Aggreko GG0400GASCON glycol reboilers, and one (1) Enclosed Combustion Unit (ECD-1).

The following types of emission sources are included in the project: CAT G3516B, CAT G3606 A4, Waukesha P9394GSI S5, CAT G3612A4, Waukesha 12V275GL, Aggreko GG0400GASCON, and Enclosed Combustion Unit. The emission units used in the modeling are described in the tables below.

For this permit, modeling was required for the following pollutants: Carbon Monoxide (CO), Nitrogen Dioxide (NO_2), Particulate Matter 10 micrometers or less in aerodynamic diameter (PM_{10}), Particulate Matter (2.5 microns or less) ($PM_{2.5}$), and Sulfur Dioxide (SO_2).

Table 1. Table of Total Facility Emissions

NO_2 Rate (lbs/hr)	CO Rate (lbs/hr)	SO_2 Rate (lbs/hr)	PM_{10} Rate (lbs/hr)	$PM_{2.5}$ Rate (lbs/hr)
19.51	24.61	0.83	3.13	2.57

Table 2. Table of Point Sources

Stack Number	Description	Stack Height (ft)	Diameter (ft)	Velocity (ft/s)	Temperature (°F)	NO_2 Rate (lbs/hr)	CO Rate (lbs/hr)	SO_2 Rate (lbs/hr)	PM_{10} Rate (lbs/hr)	$PM_{2.5}$ Rate (lbs/hr)
E-1	1380 hp Caterpillar Compressor Engine	25.00	1.33	109.49	993	1.67	9.46	0.06	0.11	0.11
E-2	1380 hp Caterpillar Compressor Engine	25.00	1.33	109.49	993	1.67	9.46	0.06	0.11	0.11
E-4	1875 hp Caterpillar Compressor Engine	27.25	2.00	63.70	809	2.07	9.09	0..06	0.12	0.12
E-5	2500 hp Waukesha Compressor Engine	24.50	2.00	55.30	1,066	65.97	33.40	0.09	0.34	0.34
E-6	2500 hp Waukesha Compressor Engine	24.50	2.00	55.30	1,066	65.97	33.40	0.09	0.34	0.34
E-7	2500 hp Waukesha Compressor Engine	24.50	2.00	55.30	1,066	65.97	33.40	0.09	0.34	0.34
E-8	2500 hp Waukesha Compressor Engine	24.50	2.00	55.30	1,066	65.97	33.40	0.09	0.34	0.34
E-9*	2500 hp Compressor Engine	24.50	2.00	55.30	1,066	65.97	33.40	0.09	0.34	0.34
E-10*	3750 hp Compressor Engine	34.92	2.50	88.02	836	2.48	19.84	0.13	0.25	0.25
GEN-4	536 hp Generator Engine	15.00	0.50	205.84	1,000	1.18	2.36	0.02	0.08	0.08
GEN-5	536 hp Generator Engine	15.00	0.50	205.84	1,000	1.18	2.36	0.02	0.08	0.08

H-1	0.5 MMBtu/hr Reboiler	11.20	0.50	12.69	500	0.05	0.04	0.003	0.00	0.00
H-2	1 MMBtu/hr Reboiler	20.00	1.00	6.34	500	0.09	0.08	0.005	0.01	0.01
ECD-1	Enclosed Combustion Device	25.00	4	7.3	800	0.85	0.43	0.0003	--	--

**Represents worst-case scenario between both engine options.*

Modeling Assumptions:
The facility operates continuously all year long, 8760 hours per year.

Permit Conditions:
The facility has no additional permit conditions derived from these modeling analyses.

Conclusion:
This modeling analysis demonstrates that operation of the facility described in this report neither causes nor contributes to any exceedances of applicable air quality standards. The standards relevant at this facility are NAAQS for CO, NO_2, PM10, PM2.5, and SO_2.

Action: The permit can be issued based on this modeling analysis.
Modeling report submitted by Resolute Compliance, LLC (dated 5/9/2024).
The air quality analysis demonstrates compliance with applicable regulatory requirements. Model(s) Used: AERMOD VIEW Version 12.0.0 was used to run the modeling analysis.

Note: Complete modeling input and output files can be made available and are located in the Modeling Archives in the folder, "7868M5_Delaware G&P, LLC_Horned Frog Compressor Station".

Modeling Parameters:
The AERMOD regulatory default parameters were included in assumptions made by the model.

Building downwash produced by buildings at the facility was considered. The following buildings were included in the modeling.

Table 3. Table of Buildings

Building Name	Height (m)	Diagonal Length (m)
TK-1	6.096	3.658
TK-2	6.096	3.658
TK-3	6.096	3.658

TK-4	6.096	3.658
TK-5	6.096	3.658
TK-6	6.096	3.658
TK-7	6.096	3.658
TK-8	6.096	3.658
TK-9	6.096	3.658
GB-1	7.315	4.755

Complex Terrain Data:
Elevations of receptors, facility sources, and surrounding sources were obtained from USGS GeoTIFF files using AERMAP.
Elevated terrain was used to model the facility.

Receptor Grid: The following grids were used to determine the maximum concentration for each pollutant.

Table 4. Table of Receptors

Grid Type	Description	Shape	Spacing	Radius or Length
Cartesian	Intermediate	Square	1 kilometer	45 kilometers
Cartesian	Intermediate	Square	250 meters	4 kilometers
Cartesian	Fine	Square	100 meters	500 meters
Cartesian	Very fine	Square	50 meters	500 meters

Receptors outside of the radii of impact were discarded for the surrounding source runs.

Meteorological Data: HOBBS 2017_2021

Adjacent Sources: The Division 's Modeling Guidance was used to select surrounding sources for NO_2, CO, SO_2, PM_{10}, and $PM_{2.5}$ which were used in the AERMOD modeling analysis. The closest the facility is to another source is 1.12 km from Redhills Unit 16H.

PSD Increment Information:
The facility is a minor source (for PSD purposes) located in AQCR 155. The minor source baseline dates here are 3/16/1988 for NO_2, 7/28/1978 for SO_2, 2/20/1979 for PM10, and 11/13/2013 for PM2.5.
The facility is 75 km (via Google Earth) from the Class I area Carlsbad Caverns National Park.

Results Discussions:
CO Analysis:
The 1-hour CO concentration was below the significance level. No cumulative analysis is

required. The maximum source alone 1-hour CO concentration was 175.509 µg/m^3, which occurred 141 m southeast from the center of the facility. This was 8.78% of the NAAQS SIL.

The 8-hour CO concentration was below the significance level. No cumulative analysis is required. The maximum source alone 8-hour CO concentration was 89.55 µg/m^3, which occurred 139 m northeast from the center of the facility. This was 17.91% of the NAAQS SIL.

NO_2 Analysis:

The conversion of 100% NOX to NO2 was utilized for the analysis.

Compliance with 1-hour NO_2 NAAQS automatically demonstrates compliance with air quality standards of other periods. The 1-hour NOx concentration is above the significance level. The maximum source alone 1-hour NOx concentration was 112.534 µg/m^3, which occurred 143 m west from the center of the facility. A background concentration of 65.8 µg/m^3 was added from the monitor 5ZS (ID: 350250008), at 2320 N. Jefferson St., Hobbs NM. A cumulative concentration of 178.33 µg/m^3 was 94.01% of the NAAQS[1].

The maximum source alone 24-hr NO2 concentration was 32.37 µg/m^3, which occurred 114 m northwest from the center of the facility. This was above the NAAQS SIL of 5 µg/m^3 and is significant.

The maximum source alone annual NO2 concentration was 5.39 µg/m^3, which occurred 114 m northwest from the center of the facility. A background concentration of 9.3 µg/m^3 was added from the monitor 5ZS (ID: 350250008), at 2320 N. Jefferson St., Hobbs NM. A cumulative concentration of 14.69 µg/m^3 was 14.69% of the NAAQS[1].

PM_{10} Analysis:

The 24-hour PM10 concentration is above the significance level. A cumulative analysis is required. The maximum source alone annual PM10 concentration was 3.447 µg/m^3, which occurred 141 m southeast from the center of the facility. Surrounding source concentrations were included in the modeling analysis but did not impact the maximum concentration result. A background concentration of 37.3 µg/m^3 was added from the monitor 5ZS (ID: 350250008), at 2320 N. Jefferson St., Hobbs NM. A cumulative concentration of 40.74 µg/m^3 was 27.16% of the NAAQS[1].

The annual PM10 concentration was above the significance level. A cumulative analysis is required. The maximum source alone annual PM10 concentration was 0.086 µg/m^3, which occurred 99 m north from the center of the facility. Surrounding source concentrations were included in the modeling analysis but did not impact the maximum concentration result. A background concentration of 24.0 µg/m^3 was added from the monitor 5ZS (ID: 350250008), at 2320 N. Jefferson St., Hobbs NM. A cumulative concentration of 24.086 µg/m^3 was above the NAAQS SIL of 1 µg/m^3 and is significant.

$PM_{2.5}$ Analysis:

The PM2.5 analysis was represented as PM10 as a worst-case scenario.

The maximum total 24-hour PM2.5 concentration was 3.44 µg/m^3, which occurred 141 m southeast the center of the facility. Surrounding source concentrations were included in the modeling analysis but did not impact the maximum concentration result. A background concentration of 16.5 µg/m^3 was added from the monitor 5ZS (ID: 350250008), at 2320 N. Jefferson St., Hobbs NM. A cumulative concentration of 19.94 µg/m^3 was 56.97% of the NAAQS[1].

The maximum total annual PM2.5 concentration was 0.086 µg/m^3, which occurred 999 m north from the center of the facility. Surrounding source concentrations were included in the modeling analysis but did not impact the maximum concentration result. A background concentration of 7.1 µg/m^3 was added from the monitor 5ZS (ID: 350250008), at 2320 N. Jefferson St., Hobbs NM. A cumulative concentration of 7.186 µg/m^3 was 59.88% of the NAAQS[1].

SO_2 Analysis:

Compliance with 1-hour SO_2 NAAQS automatically demonstrates compliance with air quality standards of other periods. The 1-hour SO_2 concentration was below the significance level. No cumulative analysis is required. The maximum source alone 1-hour SO_2 concentration was 3.750 µg/m^3, which occurred 143 m west from the center of the facility. This was 48.08% of the NAAQS SIL.

The 3-hour SO_2 concentration was below the significance level. No cumulative analysis is required. The maximum source alone 3-hour SO_2 concentration was 2.754 µg/m^3, which occurred 137 m east from the center of the facility. This was 11.00% of the NAAQS SIL.

The annual SO_2 concentration was below the significance level. No cumulative analysis is required. The maximum source alone annual SO_2 concentration was 0.205 µg/m^3, which occurred 141 m northwest from the center of the facility. This was 20.60% of the NAAQS SIL.

Table 5. Table of Ambient Impact from Emissions

Pollutant	Period	Modeled Facility Concentration ($\mu g/m^3$)	Modeled Concentration with Surrounding Sources ($\mu g/m^3$)	Secondary Formation ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Cumulative Concentration ($\mu g/m^3$)	Standard	Value of Standard ($\mu g/m^3$)	Percent of Standard	UTM East (m)	UTM North (m)	Elevation (ft)
NO_2	1-hour	112.53	-	-	65.8	178.33	NAAQS[1]	188	94.86	633103.9	3550522.2	3380.217
NO_2	24-hour	32.37	-	-	-	32.37	NAAQS SIL	5	647.40	633103.9	3550522.2	3380.217
NO_2	Annual	5.39	-	-	9.3	14.69	NAAQS[1]	100	14.69	633176.9	3550623.5	3380.446
CO	1-hour	175.5	-	-	-	175.5	NAAQS SIL	2000	8.78	633304.6	3550380.1	3372.080
CO	8-hour	89.55	-	-	-	89.55	NAAQS SIL	500	17.91	633388.9	3550498.8	3371.457
SO_2	1-hour	3.75	-	-	-	3.75	NAAQS SIL	7.8	48.08	633103.9	3550522.2	3380.217
SO_2	3-hour	2.75	-	-	-	2.75	NAAQS SIL	25	11.00	633388.7	3550498.8	3371.457
SO_2	Annual	0.206	-	-	-	0.206	NAAQS SIL	1	20.60	633176.9	3550623.5	3380.446
PM_{10}	24-hour	3.44	3.44	-	37.3	40.74	NAAQS[1]	150	27.16	633304.6	3550380.5	3372.080
PM_{10}	Annual	0.086	0.086	-	24	24.086	NAAQS SIL	1	2408.60	633251.0	3551517.0	3392.913
$PM_{2.5}$	24-hour	3.44	3.44	-	16.5	19.94	NAAQS[1]	35	56.97	633304.6	3550380.5	3372.080
$PM_{2.5}$	Annual	0.086	0.086	-	7.1	7.186	NAAQS[1]	12	59.88	633251.0	3551517.0	3392.913

Universal Application 4

Air Dispersion Modeling Report

Refer to and complete Section 16 of the Universal Application form (UA3) to assist your determination as to whether modeling is required. If, after filling out Section 16, you are still unsure if modeling is required, e-mail the completed Section 16 to the AQB Modeling Manager for assistance in making this determination. If modeling is required, a modeling protocol would be submitted and approved prior to an application submittal. The protocol should be emailed to the modeling manager. A protocol is recommended but optional for minor sources and is required for new PSD sources or PSD major modifications. Fill out and submit this portion of the Universal Application form (UA4), the "Air Dispersion Modeling Report", only if air dispersion modeling is required for this application submittal. This serves as your modeling report submittal and should contain all the information needed to describe the modeling. No other modeling report or modeling protocol should be submitted with this permit application.

16-A: Identification

1	Name of facility:	Horned Frog Compressor Station
2	Name of company:	Delaware G&P, LLC
3	Current Permit number:	GCP No. 7867M5
4	Name of applicant's modeler:	Jeff Jackson, Resolute Compliance, LLC
5	Phone number of modeler:	972-842-4304
6	E-mail of modeler:	jj@resolutecompliance.com

16-B: Brief

1	Was a modeling protocol submitted and approved?	Yes☒	No☐
2	Why is the modeling being done?	Adding New Equipment	
3	Describe the permit changes relevant to the modeling.		
	Additional compression added which will increase emissions beyond GCP limits; existing equipment emissions changes to accommodate increase drive need for modeling site emissions to determine NAAQS compliance in this initial NSR application.		
4	What geodetic datum was used in the modeling?	NAD83	
5	How long will the facility be at this location?	Permanent Facility	
6	Is the facility a major source with respect to Prevention of Significant Deterioration (PSD)?	Yes☐	No☒

7	Identify the Air Quality Control Region (AQCR) in which the facility is located	155	
8	List the PSD baseline dates for this region (minor or major, as appropriate).		
	NO2	March 16, 1988	
	SO2	July 28, 1978	
	PM10	February 20, 1979	
	PM2.5	November 13, 2013	
9	Provide the name and distance to Class I areas within 50 km of the facility (300 km for PSD permits).		
	There are no Class 1 areas within 50 km of the Horned Frog Compressor Station		
10	Is the facility located in a non-attainment area? If so describe below	Yes☐	No☒
11	Describe any special modeling requirements, such as streamline permit requirements.		
	N/A		

16-C: Modeling History of Facility

1. Describe the modeling history of the facility, including the air permit numbers, the pollutants modeled, the National Ambient Air Quality Standards (NAAQS), New Mexico AAQS (NMAAQS), and PSD increments modeled. (Do not include modeling waivers).

Pollutant	Latest permit and modification number that modeled the pollutant facility-wide.	Date of Permit	Comments
CO	7864M5	4/25/2024	GCP-O&G Permit modeling
NO_2	7864M5	4/25/2024	GCP-O&G Permit modeling
SO_2	7864M5	4/25/2024	GCP-O&G Permit modeling
H_2S	N/A	N/A	N/A
PM2.5	7864M5	4/25/2024	GCP-O&G Permit modeling
PM10	7864M5	4/25/2024	GCP-O&G Permit modeling
Lead	N/A	N/A	Facility has no permitted lead emissions
Ozone (PSD only)	N/A	N/A	Not a PSD Permit
NM Toxic Air Pollutants (20.2.72.402 NMAC)	N/A	N/A	Facility does not require TAL modeling.

16-D: Modeling performed for this application

1. For each pollutant, indicate the modeling performed and submitted with this application.
Choose the most complicated modeling applicable for that pollutant, i.e., culpability analysis assumes ROI and cumulative analysis were also performed.

Pollutant	ROI	Cumulative analysis	Culpability analysis	Waiver approved	Pollutant not emitted or not changed.
CO	☒	☐	☐	☐	☐

	NO_2	☒	☒	☐	☐	☐
	SO_2	☒	☐	☐	☐	☐
	H_2S	☐	☐	☐	☐	☒
	PM2.5	☒	☒	☐	☐	☐
	PM10	☒	☒	☐	☐	☐
	Lead	☐	☐	☐	☐	☒
	Ozone	☐	☐	☐	☐	☒
	State air toxic(s) (20.2.72.402 NMAC)	☐	☐	☐	☐	☒

16-E: New Mexico toxic air pollutants modeling

1

List any New Mexico toxic air pollutants (NMTAPs) from Tables A and B in 20.2.72.502 NMAC that are modeled for this application.
N/A
The facility does not emit any toxic air pollutants listed in Tables A and B in 20.2.72.502 NMAC.

2

List any NMTAPs that are emitted but not modeled because stack height correction factor. Add additional rows to the table below, if required.

Pollutant	Emission Rate (pounds/hour)	Emission Rate Screening Level (pounds/hour)	Stack Height (meters)	Correction Factor	Emission Rate/ Correction Factor
N/A	N/A	N/A	N/A	N/A	N/A

16-F: Modeling options

1	Was the latest version of AERMOD used with regulatory default options? If not explain below.	Yes☒	No☐
	Delaware G&P ran the model in Regulatory Default mode with the following options: • the use of stack-tip downwash; • incorporating the effects of simple terrain; and • including the calms and missing data processing routines. To estimate NO2 concentrations, the Ambient Ratio Method 2 (ARM2) was used. As indicated in AERMOD User's Guide Section 3.3.6.3, 0.5 was used for the minimum ambient ratio and 0.9 for the maximum ambient ratio		

16-G: Surrounding source modeling

1	Date of surrounding source retrieval	Surrounding sources were downloaded from NMED February 23, 2024 for NO_X, SO_2, $PM_{2.5}$, PM_{10} and were used in cumulative modeling.

2

If the surrounding source inventory provided by the Air Quality Bureau was believed to be inaccurate, describe how the sources modeled differ from the inventory provided. If changes to the surrounding source inventory were made, use the table below to describe them. Add rows as needed.

AQB Source ID	Description of Corrections
N/A	N/A

16-H: Building and structure downwash

1	How many buildings are present at the facility?	The following structures were included in the modeling scenario: • N/A
2	How many above ground storage tanks are present at the facility?	• Six (6) Condensate Tanks • Two (2) Condensate tanks • One (1) Gunbarrel separator
3	Was building downwash modeled for all buildings and tanks? If not explain why below.	Yes☒ No☐
4	Building comments	N/A

16-I: Receptors and modeled property boundary

1	"Restricted Area" is an area to which public entry is effectively precluded. Effective barriers include continuous fencing, continuous walls, or other continuous barriers approved by the Department, such as rugged physical terrain with a steep grade that would require special equipment to traverse. If a large property is completely enclosed by fencing, a restricted area within the property may be identified with signage only. Public roads cannot be part of a Restricted Area. A Restricted Area is required in order to exclude receptors from the facility property. If the facility does not have a Restricted Area, then receptors shall be placed within the property boundaries of the facility. Describe the fence or other physical barrier at the facility that defines the restricted area.					
	The facility has installed a perimeter fence to restrict access to the site.					
2	Receptors must be placed along publicly accessible roads in the restricted area. Are there public roads passing through the restricted area?				Yes☐	No☒
3	Are restricted area boundary coordinates included in the modeling files?				Yes☒	No☐
4	Describe the receptor grids and their spacing. The table below may be used, adding rows as needed.					

Grid Type	Shape	Spacing	Start distance from restricted area or center of facility	End distance from restricted area or center of facility	Comments
Cartesian	Square	50 meters	0 meters	500 meters	
Cartesian	Square	100 meters	500 meters	1 km	
Cartesian	Square	250 meters	1 km	5 km	
Cartesian	Square	1 km	5 km	50+ km	
Cartesian	Circle	50, 100, 250, 500, & 1000 meters	0 meters (from emissions centroid)		
Cartesian	Circle	50 meters	0 meters (from emissions centroid)		
Cartesian	Circle	50, 100 meters	0 meters (from emissions centroid)		

	Cartesian	Circle	50 meters	0 meters (from emissions centroid)		

5	Describe receptor spacing along the fence line.
	Fence line receptors were placed every 50m.
6	Describe the PSD Class I area receptors.
	The closest Class I area is Carlsbad Caverns National Park, but is 75 km from the facility, so no receptors are analyzed there for this study.

16-J: Modeling Scenarios

1	Identify, define, and describe all modeling scenarios. Examples of modeling scenarios include using different production rates, times of day, times of year, simultaneous or alternate operation of old and new equipment during transition periods, etc. Alternative operating scenarios should correspond to all parts of the Universal Application and should be fully described in Section 15 of the Universal Application (UA3).		
	The facility operates 24 hrs per day, 7 days per week and 52 weeks per year. This represents maximum operational hours (8,760).		
2	Which scenario produces the highest concentrations? Why?		
	N/A		
3	Were emission factor sets used to limit emission rates or hours of operation? (This question pertains to the "SEASON", "MONTH", "HROFDY" and related factor sets, not to the factors used for calculating the maximum emission rate.)	Yes☐	No☒
4	If so, describe factors for each group of sources. List the sources in each group before the factor table for that group. (Modify or duplicate table as necessary. It's ok to put the table below section 16-K if it makes formatting easier.) Sources:		

5

Hour of Day	Factor	Hour of Day	Factor								
1		13									
2		14									
3		15									
4		16									
5		17									
6		18									
7		19									
8		20									
9		21									
10		22									
11		23									
12		24									

If hourly, variable emission rates were used that were not described above, describe them below.

	N/A		
6	Were different emission rates used for short-term and annual modeling? If so describe below.	Yes☐	No☒

16-K: NO_2 Modeling

1	Which types of NO_2 modeling were used? Check all that apply.	
	☐	ARM2
	☒	100% NO_X to NO_2 conversion
	☐	PVMRM
	☐	OLM
	☐	Other:
2	Describe the NO_2 modeling.	
	The Ambient Ratio Method 2 (ARM2) technique was used for both the SIL/ROI and NAAQS/increment analyses. As indicated in AERMOD User's Guide Section 3.3.6.3, 0.5 was used for the minimum ambient ratio and 0.9 for the maximum ambient ratio.	
3	Were default NO_2/NO_X ratios (0.5 minimum, 0.9 maximum or equilibrium) used? If not describe and justify the ratios used below.	Yes☒ / No☐
	N/A	
4	Describe the design value used for each averaging period modeled.	
	1-hour: High first high Annual One Year Annual Average:	

16-L: Ozone Analysis

1	NMED has performed a generic analysis that demonstrates sources that are minor with respect to PSD do not cause or contribute to any violations of ozone NAAQS. The analysis follows. The basis of the ozone SIL is documented in *Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program*, EPA, April 17, 2018 and associated documents. NMED accepts this SIL basis and incorporates it into this permit record by reference. Complete documentation of the ozone concentration analysis using MERPS is included in the New Mexico Air Quality Bureau Air Dispersion Modeling Guidelines.
2	The MERP values presented in Table 10 and Table 11 of the NM AQB Modeling Guidelines that produce the highest concentrations indicate that facilities emitting no more than 250 tons/year of NO_X and no more than 250 tons/year of VOCs will cause less formation of O_3 than the O_3 significance level. $$[O_3]_{8-hour} = \left(\frac{250 \frac{ton}{yr}}{340_{MERP_{NOX}}} + \frac{250 \frac{ton}{yr}}{4679_{MERP_{VOC}}} \right) \times 1.96\ \mu g/m^3$$ =1.546 µg/m^3, which is below the significance level of 1.96 µg/m^3.

	Sources that produce ozone concentrations below the ozone SIL do not cause or contribute to air contaminant levels exceeding the ozone NAAQS.				
3	Does the facility emit at least 250 tons per year of NO_X or at least 250 tons per year of VOCs? Sources that emit at least 250 tons per year of NO_X or at least 250 tons per year of VOCs are covered by the analysis above and require an individual analysis.			Yes☐	No☒
5	For new PSD Major Sources or PSD major modifications, if MERPs were used to account for ozone fill out the information below. If another method was used describe below.				
	NO_X (ton/yr)	$MERP_{NOX}$	VOCs (ton/yr)	$MERP_{VOC}$	$[O_3]_{8\text{-hour}}$
	N/A	N/A	N/A	N/A	N/A

16-M: Particulate Matter Modeling

1	Select the pollutants for which plume depletion modeling was used.				
	☐	PM2.5			
	☐	PM10			
	☒	None			
2	Describe the particle size distributions used. Include the source of information.				
	N/A				
3	Does the facility emit at least 40 tons per year of NO_X or at least 40 tons per year of SO_2? Sources that emit at least 40 tons per year of NO_X or at least 40 tons per year of SO_2 are considered to emit significant amounts of precursors and must account for secondary formation of PM2.5.			Yes☒	No☐
4	Was secondary PM modeled for PM2.5? Horned Frog Compressor Station is not a PSD major source – no PM2.5 secondary formation analysis required.			Yes☐	No☒
5	If MERPs were used to account for secondary PM2.5 fill out the information below. If another method was used describe below.				
	Pollutant	NO_X	SO_2		$[PM2.5]_{24\text{-hour}}$
	$MERP_{annual}$	81.98	3.66		
	$MERP_{24\text{-hour}}$				$[PM2.5]_{annual}$
	Emission rate (ton/yr)				

16-N: Setback Distances

1	Portable sources or sources that need flexibility in their site configuration requires that setback distances be determined between the emission sources and the restricted area boundary (e.g. fence line) for both the initial location and future locations. Describe the setback distances for the initial location.
	N/A

2	Describe the requested, modeled, setback distances for future locations, if this permit is for a portable stationary source. Include a haul road in the relocation modeling.
	N/A

16-O: PSD Increment and Source IDs

1	The unit numbers in the Tables 2-A, 2-B, 2-C, 2-E, 2-F, and 2-I should match the ones in the modeling files. Do these match? If not, provide a cross-reference table between unit numbers if they do not match below.	Yes☒	No☐

Unit Number in UA-2	Unit Number in Modeling Files

2	The emission rates in the Tables 2-E and 2-F should match the ones in the modeling files. Do these match? If not, explain why below.	Yes☐	No☐
3	Have the minor NSR exempt sources or Title V Insignificant Activities" (Table 2-B) sources been modeled? N/A	Yes☐	No☒

4 Which units consume increment for which pollutants?

Unit ID	NO_2	SO_2	PM10	PM2.5

5	PSD increment description for sources. (for unusual cases, i.e., baseline unit expanded emissions after baseline date).	The facility is located in AQCR 155 which has triggered the Minor Source Baseline Date for NO2 (March 16, 1988), SO2 (July 28, 1978), PM10 (February 20, 1979), and PM2.5 (November 13, 2013).

6	Are all the actual installation dates included in Table 2A of the application form, as required? This is necessary to verify the accuracy of PSD increment modeling. If not please explain how increment consumption status is determined for the missing installation dates below.	Yes☒	No☐

16-P: Flare Modeling

1	For each flare or flaring scenario, complete the following			
	Flare ID (and scenario)	Average Molecular Weight	Gross Heat Release (cal/s)	Effective Flare Diameter (m)
	N/A	N/A		

16-Q: Volume and Related Sources

1	Were the dimensions of volume sources different from standard dimensions in the Air Quality Bureau (AQB) Modeling Guidelines? If not please explain how increment consumption status is determined for the missing installation dates below.	Yes☐	No☐
	N/A		
	Describe the determination of sigma-Y and sigma-Z for fugitive sources.		

2	N/A
3	Describe how the volume sources are related to unit numbers. Or say they are the same.
	N/A
4	Describe any open pits.
	N/A
5	Describe emission units included in each open pit.
	N/A

16-R: Background Concentrations

1	Were NMED provided background concentrations used? Identify the background station used below. If non-NMED provided background concentrations were used describe the data that was used.	Yes☐	No☐
	CO: N/A		
	NO_2: Outside Carlsbad (350151005)		
	PM2.5: Hobbs-Jefferson (350450019)		
	PM10: Hobbs-Jefferson (350250008)		
	SO_2: N/A		
	Other:		
	Comments: Consistent with NMED modeling guidance, the 1-hour NO_2 and SO_2 NAAQS modeling did include background concentrations and also included nearby sources. PM_{10} NAAQS included a 24-hour background concentration along with nearby sources. The concentration was 100.7 µg/m3. The only other pollutant and standards that require an additional monitored background concentration is the $PM_{2.5}$ NAAQS. The background concentration was 16.5 µg/m3 for the 24-hour average and 7.1 µg/m3 for the annual average.		
2	Were background concentrations refined to monthly or hourly values? If so describe below.	Yes☐	No☒

16-S: Meteorological Data

1	Was NMED provided meteorological data used? If so select the station used. Hobbs	Yes☒	No☐
2	If NMED provided meteorological data was not used describe the data set(s) used below. Discuss how missing data were handled, how stability class was determined, and how the data were processed.		
	N/A		

16-T: Terrain

1	Was complex terrain used in the modeling? If not, describe why below.	Yes☐	No☒

2	What was the source of the terrain data?
	NED GEOTIFF

16-U: Modeling Files

Describe the modeling files:

File name (or folder and file name)	Pollutant(s)	Purpose (ROI/SIA, cumulative, culpability analysis, other)
HF 1-hr NOX R2	NO2	SIA
HF Annual NOx	NO2	CIA
HF 1-hr CO	CO	SIA
HF 8-hr CO	CO	SIA
HF 1-hr SO2	SO2	SIA
HF 3-hr SO2	SO2	SIA
HF Annual SO2	SO2	SIA
HF 24-hr PM10	PM10	CIA
HF Annual PM10	PM10	CIA
HF 24-hr PM2	PM2.5	CIA
HF Annual PM2	PM 2.5	CIA

16-V: PSD New or Major Modification Applications

1	A new PSD major source or a major modification to an existing PSD major source requires additional analysis. Was preconstruction monitoring done (see 20.2.74.306 NMAC and PSD Preapplication Guidance on the AQB website)?	Yes☐	No☒
2	If not, did AQB approve an exemption from preconstruction monitoring?	Yes☐	No☐
3	Describe how preconstruction monitoring has been addressed or attach the approved preconstruction monitoring or monitoring exemption.		
	N/A		
4	Describe the additional impacts analysis required at 20.2.74.304 NMAC.		
	N/A		
5	If required, have ozone and secondary PM2.5 ambient impacts analyses been completed? If so describe below.	Yes☐	No☒
	N/A		

16-W: Modeling Results

1	If ambient standards are exceeded because of surrounding sources, a culpability analysis is required for the source to show that the contribution from this source is less than the significance levels for the specific pollutant. Was culpability analysis performed? If so describe below.	Yes☐	No☒
2	Identify the maximum concentrations from the modeling analysis. Rows may be modified, added and removed from the table below as necessary.		

Pollutant, Time Period and Standard	Modeled Facility Concentration (µg/m3)	Modeled Concentration with Surrounding Sources (µg/m3)	Secondary PM (µg/m3)	Background Concentration (µg/m3)	Cumulative Concentration (µg/m3)	Value of Standard (µg/m3)	Percent of Standard	Location		
								UTM E (m)	UTM N (m)	Elevation (ft)
NO_2 1-hr NAAQS[1]	112.53	-	-	65.8	178.33	188	94.86	633103.9	3550522.2	3380.217
NO_2 24-hr SIL	32.37	-	-	-	32.37	5	647.40	633103.9	3550522.2	3380.217
NO_2 Annual NAAQS[1]	5.39	-	-	9.3	14.69	100	14.69	633176.9	3550623.5	3380.446
CO 1-hr SIL	175.5	-	-	-	175.5	2000	8.78	633304.6	3550380.1	3372.080
CO 8-hr SIL	89.55	-	-	-	89.55	500	17.91	633388.9	3550498.8	3371.457
SO_2 1-hr SIL	3.75	-	-	-	3.75	7.8	48.08	633103.9	3550522.2	3380.217
SO_2 3-hr SIL	2.75	-	-	-	2.75	25	11.00	633388.7	3550498.8	3371.457
SO_2 Annual SIL	0.206	-	-	-	0.206	1	20.60	633176.9	3550623.5	3380.446
PM_{10} 24-hr NAAQS[1]	3.44	3.44	-	37.3	40.74	150	27.16	633304.6	3550380.5	3372.080
PM_{10} Annual SIL	0.086	0.086	-	24	24.086	1	2408.60	633251.0	3551517.0	3392.913
$PM_{2.5}$ 24-hr NAAQS[1]	3.44	3.44	-	16.5	19.94	35	56.97	633304.6	3550380.5	3372.080
$PM_{2.5}$ Annual NAAQS[1]	0.086	0.086	-	7.1	7.186	12	59.88	633251.0	3551517.0	3392.913

16-X: Summary/conclusions

	A statement that modeling requirements have been satisfied and that the permit can be issued.
1	The results of the modeling reflect demonstrates the operation of the facility described in this application neither causes or contributes to any exceedances of applicable National Ambient Air Quality Standards. The permit can be issued based on this modeling set.

Section 17

Compliance Test History

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

To show compliance with existing NSR permits conditions, you must submit a compliance test history. The table below provides an example.

Compliance Test History Table

Unit No.	Test Description	Test Date
E-1, E-2	Tested in accordance with NSPS JJJJ	1/8/2019
E-1, E-2	Tested in accordance with NSPS JJJJ	1/8/2020
E-1, E-2	Tested in accordance with NSPS JJJJ	1/6/2022
E-4	Tested in accordance with NSPS JJJJ	9/16/2022
E-1, E-2	Tested in accordance with NSPS JJJJ	1/5/2023
E-4	Tested in accordance with NSPS JJJJ	9/14/2023
E-5, E-6	Tested in accordance with NSPS JJJJ	12/19/2023
E-7, E-8	Tested in accordance with NSPS JJJJ	12/20/2023

Air Permit Application
Compliance History Disclosure Form

Pursuant to Subsection 74-2-7(S) of the New Mexico Air Quality Control Act ("AQCA"), NMSA §§ 74-2-1 to -17, the New Mexico Environment Department ("Department") may deny any permit application or revoke any permit issued pursuant to the AQCA if, within ten years immediately preceding the date of submission of the permit application, the applicant met any one of the criteria outlined below. In order for the Department to deem an air permit application administratively complete, or issue an air permit for those permits without an administrative completeness determination process, the applicant must complete this Compliance History Disclosure Form as specified in Subsection 74-2-7(P). An existing permit holder (permit issued prior to June 18, 2021) shall provide this Compliance History Disclosure Form to the Department upon request.

Permittee/Applicant Company Name		**Expected Application Submittal Date**
Delaware G&P, LLC		May 2024
Permittee/Company Contact	**Phone**	**Email**
Lance Green	225-692-6947	Lance.Green@enlink.com

	Within the 10 years preceding the expected date of submittal of the application, has the permittee or applicant:	
1	Knowingly misrepresented a material fact in an application for a permit?	☐ Yes ☒ No
2	Refused to disclose information required by the provisions of the New Mexico Air Quality Control Act?	☐ Yes ☒ No
3	Been convicted of a felony related to environmental crime in any court of any state or the United States?	☐ Yes ☒ No
4	Been convicted of a crime defined by state or federal statute as involving or being in restraint of trade, price fixing, bribery, or fraud in any court of any state or the United States?	☐ Yes ☒ No
5a	Constructed or operated any facility for which a permit was sought, including the current facility, without the required air quality permit(s) under 20.2.70 NMAC, 20.2.72 NMAC, 20.2.74 NMAC, 20.2.79 NMAC, or 20.2.84 NMAC?	☐ Yes ☒ No
5b	If "No" to question 5a, go to question 6. If "Yes" to question 5a, state whether each facility that was constructed or operated without the required air quality permit met at least one of the following exceptions: a. The unpermitted facility was discovered after acquisition during a timely environmental audit that was authorized by the Department; or b. The operator of the facility estimated that the facility's emissions would not require an air permit, **and** the operator applied for an air permit within 30 calendar days of discovering that an air permit was required for the facility.	☐ Yes ☐ No
6	Had any permit revoked or permanently suspended for cause under the environmental laws of any state or the United States?	☐ Yes ☒ No
7	For each "yes" answer, please provide an explanation and documentation.	

Section 22: Certification

Company Name: Delaware G&P, LLC

I, Manish Kumar, hereby certify that the information and data submitted in this application are true and as accurate as possible, to the best of my knowledge and professional expertise and experience.

Signed this 7th day of May, 2024, upon my oath or affirmation, before a notary of the State of Texas.

*Signature [signature] Date 5/7/2024

Manish Kumar Printed Name

Ops. Director Title

Scribed and sworn before me on this 7th day of May, 2024.

My authorization as a notary of the State of Texas expires on the 22nd day of January, 2028.

Breanne B. Halfmann Notary's Signature Date 5/7/2024

Breanne B. Halfmann Notary's Printed Name

BREANNE B. HALFMANN
Notary Public, State of Texas
Comm. Expires 01-22-2028
Notary ID 132324830

*For Title V applications, the signature must be of the Responsible Official as defined in 20.2.70.7.AE NMAC.