NMED AIR QUALITY
NSR SIGNIFICANT REVISION APPLCIATION

NORTHWIND MIDSTREAM PARTNERS, LLC
TITAN TREATER PLANT #1

Prepared By:

Sam Herrin – Engineering Manager - Facilities

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825 Town and Country Lane
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(303) 589-2743

Adam Erenstein – Manager of Consulting Services

TRINITY CONSULTANTS
9400 Holly Ave
Building 3, Suite B
Albuquerque, NM 87122
(505) 266-6611

December 2023

Project 233201.0164

Trinity Consultants
9400 Holly Ave NE, Bldg 3, Ste B, Albuquerque, NM 87122 / P 505.266.6611 / **trinityconsultants.com**

December 15, 2023

Permit Programs Manager
New Mexico Environment Department
Air Quality Bureau
Permits Section
525 Camino de los Marquez, Suite 1
Santa Fe, NM 87505

RE: Significant Revision Application for NSR Permit No. 7747-M4R4
Northwind Midstream Partners, LLC – Titan Treater Plant #1

Permit Programs Manager:

On behalf of Northwind Midstream Partners, LLC (Northwind), Trinity Consultants is submitting this application for a Significant Revision for NSR Permit No. 7747-M4R4 for the Titan Treater Plant #1, located in Lea County. Pursuant to 20.2.72.219.D.(1)(a) NMAC, this revision is for the addition of one Caterpillar G3516B compressor engine (Unit ENG-2) to the facility.

The format and content of this application are consistent with the Bureau's current policy regarding NSR applications; it is a complete application package using the most current application form. Enclosed is a hard copy of the application, including the original certification. Please feel free to contract me at (505) 266-6611 or by email at aerenstein@trinityconsultants.com if you have any questions regarding this application. Alternatively, you may contact Sam Herrin at (303) 589-2743 or by email at sherrin@nwmidstream.com.

Sincerely,

Adam Erenstein
Manager of Consulting Services

Trinity Project File 233201.0164

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**
Northwind Midstream Partners, LLC		December 15, 2023
Permittee/Company Contact	**Phone**	**Email**
Sam Herrin	(303) 589-2473	sherrin@nwmidstream.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.	

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.: 656873 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: **20.2.72.219.D.(1)(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: 38342	Updating Permit/NOI #: 7747-M4R4
1	Facility Name: Titan Treater Plant #1	Plant primary SIC Code (4 digits): 1311	
		Plant NAIC code (6 digits): 21113	
a	Facility Street Address (If no facility street address, provide directions from a prominent landmark): From Jal, NM head south on NM-205 S for 6.8 miles. Turn right on Bechham Rd and travel for 1.4 miles. Turn right on unnamed road and follow for 1 mile, bearing right at the fork to facility.		
2	Plant Operator Company Name: Northwind Midstream Partners, LLC	Phone/Fax: (303) 589-2743 / N/A	

a	Plant Operator Address: 825 Town and Country Lane, Suite 700, Houston, TX 77024	
b	Plant Operator's New Mexico Corporate ID or Tax ID: Unknown	
3	Plant Owner(s) name(s): Northwind Midstream Partners, LLC	Phone/Fax: (303) 589-2743 / N/A
a	Plant Owner(s) Mailing Address(s): 825 Town and Country Lane, Suite 700, Houston, TX 77024	
4	Bill To (Company): Northwind Midstream Partners, LLC	Phone/Fax: (303) 589-2743 / N/A
a	Mailing Address: 825 Town and Country Lane, Suite 700, Houston, TX 77024	E-mail: sherrin@nwmidstream.com
5	☐ Preparer: ☒ Consultant: Adam Erenstein	Phone/Fax: (505) 266-6611 / N/A
a	Mailing Address: 9400 Holly Ave NE, Building 3, Suite B, Albuquerque, NM 87122	E-mail: AErenstein@trinityconsultants.com
6	Plant Operator Contact: Sam Herrin	Phone/Fax: (303) 589-2743 / N/A
a	Address: 825 Town and Country Lane, Suite 700, Houston, TX	E-mail: sherrin@nwmidstream.com
7	Air Permit Contact: Sam Herrin	Title: Engineering Manager – Facilities
a	E-mail: sherrin@nwmidstream.com	Phone/Fax: (303) 589-2743 / N/A
b	Mailing Address: 825 Town and Country Lane, Suite 700, Houston, TX	
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): N/A
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: N/A
7	Has this facility been issued a No Permit Required (NPR)? ☐ Yes ☒ No	If yes, the NPR No. is: N/A
8	Has this facility been issued a Notice of Intent (NOI)? ☐ Yes ☐ No	If yes, the NOI No. is: N/A
9	Does this facility have a construction permit (20.2.72/20.2.74 NMAC)? ☒ Yes ☐ No	If yes, the permit No. is: 7747-M4R4
10	Is this facility registered under a General permit (GCP-1, GCP-2, etc.)? ☐ Yes ☒ No	If yes, the register No. is: N/A

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: 1.83 MMscf/h (average)	Daily: 44 MMscfd	Annually: 16,104 MMscf/yr
b	Proposed	Hourly: 1.83 MMscf/h (average)	Daily: 44 MMscfd	Annually: 16,104 MMscf/yr
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: 1.67 MMscf/h	Daily: 40 MMscfd	Annually: 14,640 MMscf/yr
b	Proposed	Hourly: 1.67 MMscf/h	Daily: 40 MMscfd	Annually: 14,640 MMscf/yr

Section 1-D: Facility Location Information

1	Latitude (decimal degrees): 32.02558	Longitude (decimal degrees): -103.27657	County: Lea	Elevation (ft): 2980
2	UTM Zone: ☐ 12 or ☒ 13	Datum: ☐ NAD 83 ☒ WGS 84		
a	UTM E (in meters, to nearest 10 meters): 662,750	UTM N (in meters, to nearest 10 meters): 3,544,570		
3	Name and zip code of nearest New Mexico town: Jal, NM 88252			
4	Detailed Driving Instructions from nearest NM town (attach a road map if necessary): From Jal, NM head south on NM-205 S for 6.8 miles. Turn right on Bechham Rd and travel for 1.4 miles. Turn right on unnamed road and follow for 1 mile, bearing right at the fork to facility.			
5	The facility is 7.8 miles southwest of Jal, NM.			
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: Jal, NM			
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: Texas ~2.83 km			
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): 120 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: 12 km			
12	Method(s) used to delineate the Restricted Area: fenceline "**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 ($\frac{\text{hours}}{\text{day}}$): 24	($\frac{\text{days}}{\text{week}}$): 7	($\frac{\text{weeks}}{\text{year}}$):52	($\frac{\text{hours}}{\text{year}}$): 8760		
2	Facility's maximum daily operating schedule (if less than 24 $\frac{\text{hours}}{\text{day}}$)? Start: N/A	AM PM	End: N/A	AM PM		
3	Month and year of anticipated start of construction: Upon receipt of permit.					
4	Month and year of anticipated construction completion: N/A					
5	Month and year of anticipated startup of new or modified facility: N/A					
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: N/A		
a	If yes, NOV date or description of issue: N/A		NOV Tracking No: N/A
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: N/A	Date: N/A	Requirement # (or page # and paragraph #): N/A
d	Provide the required text to be inserted in this permit: N/A		
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.) N/A (20.2.70.300.D.2 NMAC):		Phone: N/A
a	R.O. Title: N/A	R.O. e-mail: N/A	
b	R. O. Address: N/A		
2	Alternate Responsible Official N/A (20.2.70.300.D.2 NMAC):		Phone: N/A
a	A. R.O. Title: N/A	A. R.O. e-mail: N/A	
b	A. R. O. Address: N/A		
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.): N/A		
a	Address of Parent Company: N/A		
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: N/A		
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: N/A		

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: Adam Erenstein, Email: AErenstein@trinityconsultants.com,

Phone Number: (505) 266-6611.

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

Table 2-A: Regulated Emission Sources

Unit and stack numbering must correspond throughout the application package. If applying for a NOI under 20.2.73 NMAC, equipment exemptions under 2.72.202 NMAC do not apply.

Unit Number[1]	Source Description	Make	Model #	Serial #	Manufacturer's Rated Capacity[3] (Specify Units)	Requested Permitted Capacity[3] (Specify Units)	Date of Manufacture[2] / Date of Construction/ Reconstruction[2]	Controlled by Unit # / Emissions vented to Stack #	Source Classification Code (SCC)	For Each Piece of Equipment, Check One	RICE Ignition Type (CI, SI, 4SLB, 4SRB, 2SLB)[4]	Replacing Unit No.
ENG-2	Compressor Engine 2	Caterpillar	G3616	4EK04915-REF-JEF	1380 hp	1380 hp	12/16/2010 TBD	OxCAT-2 ENG-2	20200254	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	
ENG-3	Compressor Engine 3	Caterpillar	G3616	Unknown	5000 hp	5000 hp	Unknown Unknown	OxCat-3 ENG-3	20200254	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	
ENG-5	Compressor Engine 5	Caterpillar	G3616A4	Unknown	5000 hp	5000 hp	TBD TBD	OxCat-5 ENG-5	20200254	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	
GEN-1	Generator Engine 1	Caterpillar	G3516 C	Unknown	1978 hp	1978 hp	Unknown 11/1/2018	N/A GEN-1	20200254	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	
GEN-2	Generator Engine 2	Caterpillar	G3516 C	Unknown	1978 hp	1978 hp	Unknown Unknown	N/A GEN-2	20200254	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	
GEN-3	Generator Engine 3	Caterpillar	G3516 C	Unknown	1978 hp	1978 hp	Unknown Unknown	N/A GEN-3	20200254	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	
GEN-4	Generator Engine 4	Caterpillar	G3516 C	Unknown	1978 hp	1978 hp	Unknown Unknown	N/A GEN-4	20200254	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	
GEN-5	Generator Engine 5	Caterpillar	G3516 C	Unknown	1978 hp	1978 hp	Unknown Unknown	N/A GEN-5	20200254	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	
DHY-1	Glycol Dehydrator	Unknown	Unknown	Unknown	44 MMSCFD	44 MMSCFD	11/1/2018 43405	GR-1 GR-1	31000304	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	
GR-1	Glycol Reboiler	Unknown	Unknown	Unknown	0.75 MMBtu/hr	0.75 MMBtu/hr	11/1/2018 43405	N/A GR-1	31000228	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	
T-800	Slop Oil Tank 1	Unknown	Unknown	Unknown	500 BBL	500 BBL	3/1/2019 43525	F-400 F-400	40400311	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	
T-801	Slop Oil Tank 2	Unknown	Unknown	Unknown	500 BBL	500 BBL	3/1/2019 43525	F-400 F-400	40400311	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	
OILLOAD-1	Slop Oil Load	N/A	N/A	N/A	94 BBL/d	94 BBL/d	11/1/2018 43405	N/A Fugitive	40600199	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	
AM-1	Amine Unit	Unknown	Unknown	Unknown	44MMSCFD	44MMSCFD	11/1/2018 43405	F-Temp F-Temp	31000305	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	
AR-1	Amine Reboiler	Unknown	Unknown	Unknown	36 MMBtu/hr	36 MMBtu/hr	11/1/2018 43405	N/A AR-1	31000404	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	

Unit Number[1]	Source Description	Make	Model #	Serial #	Manufacturer's Rated Capacity[3] (Specify Units)	Requested Permitted Capacity[3] (Specify Units)	Date of Manufacture[2] / Date of Construction/ Reconstruction[2]	Controlled by Unit # / Emissions vented to Stack #	Source Classification Code (SCC)	For Each Piece of Equipment, Check One	RICE Ignition Type (CI, SI, 4SLB, 4SRB, 2SLB)[4]	Replacing Unit No.
AGI-COMP1	AGI Compressors	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown Unknown	N/A N/A	31088811	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	
AGI-COMP2	AGI Compressors	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown Unknown	N/A N/A	31088811	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	
F-7005	Process Flare	Unknown	Unknown	Unknown	32 MMscf/yr	32 MMscf/yr	43525 43525	N/A F-7005	31000216	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	
F-Temp	Amgas Flare	Unknown	Unknown	Unknown	Unknown	Unknown	43525 43525	N/A F-Temp	31000216	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	
F-400	Tank Flare	Unknown	Unknown	Unknown	0.41 MMscf/yr	0.41 MMscf/yr	43525 43525	N/A F-400	31000216	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	
FUG-1	Piping Fugitives	N/A	N/A	N/A	N/A	N/A	43405 43405	N/A N/A	31000311	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	
TO-1	Thermal Oxidizer	Unknown	Unknown	Unknown	4 MMscf/day	4 MMscf/day	Unknown Unknown	TO-1 TO-1	31000404	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	
FUG-2	Piping Fugitives	N/A	N/A	N/A	N/A	N/A	N/A N/A	N/A N/A	31000311	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	
OILLOAD-1	Slop Oil Load	N/A	N/A	N/A	94 BBL/d	94 BBL/d	Nov-18 11/1/2018	N/A N/A	40600199	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	

[1] Unit numbers must correspond to unit numbers in the previous permit unless a complete cross reference table of all units in both permits is provided.

[2] Specify dates required to determine regulatory applicability.

[3] To properly account for power conversion efficiencies, generator set rated capacity shall be reported as the rated capacity of the engine in horsepower, not the kilowatt capacity of the generator set.

[4] "4SLB" means four stroke lean burn engine, "4SRB" means four stroke rich burn engine, "2SLB" means two stroke lean burn engine, "CI" means compression ignition, and "SI" means spark ignition

Table 2-B: Insignificant Activities[1] (20.2.70 NMAC) OR Exempted Equipment (20.2.72 NMAC)

All 20.2.70 NMAC (Title V) applications must list all Insignificant Activities in this table. All 20.2.72 NMAC applications must list Exempted Equipment in this table. If equipment listed on this table is exempt under 20.2.72.202.B.5, include emissions calculations and emissions totals for 202.B.5 "similar functions" units, operations, and activities in Section 6, Calculations. Equipment and activities exempted under 20.2.72.202 NMAC may not necessarily be Insignificant under 20.2.70 NMAC (and vice versa). Unit & stack numbering must be consistent throughout the application package. Per Exemptions Policy 02-012.00 (see http://www.env.nm.gov/aqb/permit/aqb_pol.html), 20.2.72.202.B NMAC Exemptions do not apply, but 20.2.72.202.A NMAC exemptions do apply to NOI facilities under 20.2.73 NMAC. List 20.2.72.301.D.4 NMAC Auxiliary Equipment for Streamline applications in Table 2-A. The List of Insignificant Activities (for TV) can be found online at https://www.env.nm.gov/wp-content/uploads/sites/2/2017/10/InsignificantListTitleV.pdf. TV sources may elect to enter both TV Insignificant Activities and Part 72 Exemptions on this form.

Unit Number	Source Description	Manufacturer	Model No.	Max Capacity	List Specific 20.2.72.202 NMAC Exemption (e.g. 20.2.72.202.B.5)	Date of Manufacture /Reconstruction[2]	For Each Piece of Equipment, Check Onc
			Serial No.	Capacity Units	Insignificant Activity citation (e.g. IA List Item #1.a)	Date of Installation /Construction[2]	
Small Tanks	Small tanks for storing glycol make-up, Amine make-up, lube oil	N/A	N/A	55	20.2.72.202.B.2 NMAC	Nov-18	☑ Existing (unchanged) ☐ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced
			N/A	gallons	N/A	Nov-18	
							☐ Existing (unchanged) ☐ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced
							☐ Existing (unchanged) ☐ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced
							☐ Existing (unchanged) ☐ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced
							☐ Existing (unchanged) ☐ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced
							☐ Existing (unchanged) ☐ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced
							☐ Existing (unchanged) ☐ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced
							☐ Existing (unchanged) ☐ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced
							☐ Existing (unchanged) ☐ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced
							☐ Existing (unchanged) ☐ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced
							☐ Existing (unchanged) ☐ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced

[1] Insignificant activities exempted due to size or production rate are defined in 20.2.70.300.D.6, 20.2.70.7.Q NMAC, and the NMED/AQB List of Insignificant Activities, dated September 15, 2008. Emissions from these insignificant activities do not need to be reported, unless specifically requested.

[2] Specify date(s) required to determine regulatory applicability.

Table 2-C: Emissions Control Equipment

Unit and stack numbering must correspond throughout the application package. Only list control equipment for TAPs if the TAP's maximum uncontrolled emissions rate is over its respective threshold as listed in 20.2.72 NMAC, Subpart V, Tables A and B. 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.

Control Equipment Unit No.	Control Equipment Description	Date Installed	Controlled Pollutant(s)	Controlling Emissions for Unit Number(s)[1]	Efficiency (% Control by Weight)	Method used to Estimate Efficiency
OxCat-2	Oxidation Catalyst	TBD	CO, HCHO	ENG-2	CO - 75% HCHO - 66%	Manufacturer Specification Sheet
OxCat-3	Oxidation Catalyst	November 2018	CO, VOC, HAP	ENG-3	CO: 93% VOC: 71.4% HCHO: 85%	Manufacturer Specification Sheet
OxCat-5	Oxidation Catalyst	TBD	NOx, CO, VOC, HCHO	ENG-5	NOx - 90% CO - 94% VOC - 71% HCHO - 85%	Manufacturer Specification Sheet
F-400	Tank Flare	November 2018	VOC, HAP	T-800, T-801	98%	Flare DE
TO-1	Thermal Oxidizer	Unknown	VOC, HAP, H2S	Various	100%	Manufacturer Specification Sheet
F-7005	Process Flare	November 2018	VOC, HAP	Various	98%	Flare DE
GR-1	Glycol Reboiler	November 2018	VOC, HAP, H2S	DHY-1	98%	Assumed
AR-1	Amine Reboiler	November 2018	VOC, HAP, H2S	AM-1	98%	Assumed
AGI	Acid gas injection (underground)	N/A	H2S	AM-1	100%	Engineering Estimate

[1] List each control device on a separate line. For each control device, list all emission units controlled by the control device.

Table 2-D: Maximum Emissions (under normal operating conditions)

☐ **This Table was intentionally left blank because it would be identical to Table 2-E.**

Maximum Emissions are the emissions at maximum capacity and prior to (in the absence of) pollution control, emission-reducing process equipment, or any other emission reduction. Calculate the hourly emissions using the worst case hourly emissions for each pollutant. For each pollutant, calculate the annual emissions as if the facility were operating at maximum plant capacity without pollution controls for 8760 hours per year, unless otherwise approved by the Department. List Hazardous Air Pollutants (HAP) & Toxic Air Pollutants (TAPs) in Table 2-I. Unit & stack numbering must be consistent throughout the application package. Fill all cells in this table with the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected. Numbers shall be expressed to at least 2 decimal points (e.g. 0.41, 1.41, or 1.41E-4).

Unit No.	NOx		CO		VOC		SOx		PM[1]		PM10[1]		PM2.5[1]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
ENG-2	1.52	6.66	7.21	31.58	2.59	11.33	0.050	0.22	0.099	0.43	0.099	0.43	0.099	0.43	-	-	-	-
ENG-3	5.50	24.09	25.08	109.85	3.08	13.49	0.020	0.090	-	-	0.36	1.59	0.36	1.59	-	-	-	-
ENG-5	5.51	24.14	25.13	110.08	5.39	23.62	0.020	0.086	0.33	1.46	0.33	1.46	0.33	1.46	-	-	-	-
GEN-1	3.94	17.27	8.14	35.64	2.00	8.77	8.70E-03	0.040	-	-	0.14	0.63	0.14	0.63	-	-	-	-
GEN-2 [1]	3.94	10.60	8.10	21.97	2.00	5.40	8.70E-03	0.020	-	-	0.14	0.39	0.14	0.39	-	-	-	-
GEN-3 [1]	3.94		8.10		2.00		8.70E-03		-		0.14		0.14		-		-	-
GEN-4 [1]	3.94		8.10		2.00		8.70E-03		-		0.14		0.14		-		-	-
GEN-5 [1]	3.94		8.10		2.00		8.70E-03		-		0.14		0.14		-		-	-
DHY-1	-	-	-	-	12.92	56.60	-	-	-	-	-	-	-	-	6.00E-04	2.60E-03	-	-
GR-1	0.070	0.32	0.060	0.27	4.04E-03	0.020	4.41E-04	1.93E-03	-	-	5.59E-03	0.020	5.59E-03	0.020	-	-	-	-
T-800	-	-	-	-	1.60	7.02	-	-	-	-	-	-	-	-	0.080	0.35	-	-
T-801	-	-	-	-	1.60	7.02	-	-	-	-	-	-	-	-	0.080	0.35	-	-
AM-1	-	-	-	-	91.82	402.19	-	-	-	-	-	-	-	-	-	-	-	-
AR-1	3.53	15.46	2.96	12.99	0.19	0.85	0.020	0.090	-	-	0.27	1.17	0.27	1.17	-	-	-	-
F-7005	0.050	0.22	0.13	0.58	0.22	0.95	3.62E-04	1.59E-03	-	-	-	-	-	-	3.69E-06	1.62E-05	-	-
F-400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-1	-	-	-	-	0.32	1.38	-	-	-	-	-	-	-	-	4.04E-03	0.020	-	-
FUG-2	-	-	-	-	0.20	0.87	-	-	-	-	-	-	-	-	2.55E-03	0.010	-	-
TO-1	1.10	2.42	0.64	1.40	-	-	116.28	0.20	-	-	0.060	0.13	0.060	0.13	0.060	1.04E-04	-	-
OILOAD-1	-	-	-	-	37.30	2.80	-	-	-	-	-	-	-	-	-	-	-	-
Malfunction	-	-	-	-	-	10.00	-	-	-	-	-	-	-	-	-	-	-	-
Totals	36.98	101.18	101.75	324.36	167.23	552.31	116.43	0.75	0.43	1.89	1.83	5.82	1.83	5.82	0.23	0.73	-	-

[1]**Condensable Particulate Matter:** Include condensable particulate matter emissions for PM10 and PM2.5 if the source is a combustion source. Do not include condensable particulate matter for PM unless PM is set equal to PM10 and PM2.5. Particulate matter (PM) is not subject to an ambient air quality standard, but PM is a regulated air pollutant under PSD (20.2.74 NMAC) and Title V (20.2.70 NMAC).

Table 2-E: Requested Allowable Emissions

Unit & stack numbering must be consistent throughout the application package. Fill all cells in this table with the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected. Numbers shall be expressed to at least 2 decimal points (e.g. 0.41, 1.41, or $1.41E^{-4}$).

Unit No.	NOx		CO		VOC		SOx		PM[1]		PM10[1]		PM2.5[1]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
ENG-2	1.52	6.66	1.80	7.86	1.76	7.73	0.050	0.22	0.099	0.43	0.099	0.43	0.099	0.43	-	-	-	-
ENG-3	5.50	24.09	1.76	7.71	0.88	3.85	0.020	0.090	-	-	0.36	1.59	0.36	1.59	-	-	-	-
ENG-5	0.55	2.41	1.52	6.67	1.31	5.76	0.020	0.086	0.33	1.46	0.33	1.46	0.33	1.46	-	-	-	-
GEN-1	3.94	17.27	8.14	35.64	2.00	8.77	8.70E-03	0.040	-	-	0.14	0.63	0.14	0.63	-	-	-	-
GEN-2 [1]	3.94	10.60	8.10	21.97	2.00	5.40	8.70E-03	0.020	-	-	0.14	0.39	0.14	0.39	-	-	-	-
GEN-3 [1]	3.94		8.10		2.00		8.70E-03		-		0.14		0.14		-		-	-
GEN-4 [1]	3.94		8.10		2.00		8.70E-03		-		0.14		0.14		-		-	-
GEN-5 [1]	3.94		8.10		2.00		8.70E-03		-		0.14		0.14		-		-	-
DHY-1	-	-	-	-	0.26	1.13	-	-	-	-	-	-	-	-	1.20E-05	5.20E-05	-	-
GR-1	0.070	0.32	0.060	0.27	4.04E-03	0.020	4.41E-04	1.93E-03	-	-	5.59E-03	0.020	5.59E-03	0.020	-	-	-	-
T-800	-	-	-	-	0.030	0.14	-	-	-	-	-	-	-	-	1.60E-03	7.02E-03	-	-
T-801	-	-	-	-	0.030	0.14	-	-	-	-	-	-	-	-	1.60E-03	7.02E-03	-	-
AM-1	-	-	-	-	1.84	8.04	-	-	-	-	-	-	-	-	-	-	-	-
AR-1	3.53	15.46	2.96	12.99	0.19	0.85	0.020	0.090	-	-	0.27	1.17	0.27	1.17	-	-	-	-
F-7005	0.050	0.22	0.13	0.58	0.22	0.95	3.62E-04	1.59E-03	-	-	-	-	-	-	3.69E-06	1.62E-05	-	-
F-400	0.010	0.060	0.040	0.16	0.070	0.32	6.48E-04	2.84E-03	-	-	-	-	-	-	1.22E-03	5.33E-03	-	-
FUG-1	-	-	-	-	0.32	1.38	-	-	-	-	-	-	-	-	4.04E-03	0.020	-	-
FUG-2	-	-	-	-	0.20	0.87	-	-	-	-	-	-	-	-	2.55E-03	0.010	-	-
TO-1	1.10	2.42	0.64	1.40	-	-	116.28	0.20	-	-	0.060	0.13	0.060	0.13	0.060	1.04E-04	-	-
OILLOAD-1	-	-	-	-	37.30	2.80	-	-	-	-	-	-	-	-	-	-	-	-
Malfunction	-	-	-	-	-	10.00	-	-	-	-	-	-	-	-	-	-	-	-
Totals	32.03	79.52	49.45	95.25	54.42	58.15	116.43	0.75	0.43	1.89	1.83	5.82	1.83	5.82	0.07	0.05	-	-

[1] **Condensable Particulate Matter:** Include condensable particulate matter emissions for PM10 and PM2.5 if the source is a combustion source. Do not include condensable particulate matter for PM unless PM is set equal to PM10 and PM2.5. Particulate matter (PM) is not subject to an ambient air quality standard, but it is a regulated air pollutant under PSD (20.2.74 NMAC) and Title V (20.2.70 NMAC).

"*" Denotes an hourly emission rate is not appropriate

Table 2-F: Additional Emissions during Startup, Shutdown, and Routine Maintenance (SSM)

☒ This table is intentionally left blank since all emissions at this facility due to routine or predictable startup, shutdown, or scehduled maintenance are no higher than those listed in Table 2-E and a malfunction emission limit is not already permitted or requested. If you are required to report GHG emissions as described in Section 6a, include any GHG emissions during Startup, Shutdown, and/or Scheduled Maintenance (SSM) in Table 2-P. Provide an explanations of SSM emissions in Section 6 and 6a.

All applications for facilities that have emissions during routine our predictable startup, shutdown or scheduled maintenance (SSM)[1], including NOI applications, must include in this table the Maximum Emissions during routine or predictable startup, shutdown and scheduled maintenance (20.2.7 NMAC, 20.2.72.203.A.3 NMAC, 20.2.73.200.D.2 NMAC). In Section 6 and 6a, provide emissions calculations for all SSM emissions reported in this table. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (https://www.env.nm.gov/aqb/permit/aqb_pol.html) for more detailed instructions. Numbers shall be expressed to at least 2 decimal points (e.g. 0.41, 1.41, or 1.41E-4).

Unit No.	NOx		CO		VOC		SOx		PM[2]		PM10[2]		PM2.5[2]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
TO-1 SSM	4.00	4.83E-03	2.32	2.80E-03	-	-	5814.78	8.74	-	-	0.22	2.61E-04	0.22	2.61E-04	3.10	4.65E-03	-	-
F-7005 SSM	16.66	0.20	44.68	5.36	125.63	15.08	414.15	49.70	-	-	-	-	-	-	4.50	0.54	-	-
Totals	20.66	0.20	47.00	5.36	125.63	15.08	6228.93	58.44	-	-	0.22	2.61E-04	0.22	2.61E-04	7.60	0.54		

[1] **For instance**, if the short term steady-state Table 2-E emissions are 5 lb/hr and the SSM rate is 12 lb/hr, enter 7 lb/hr in this table. If the annual steady-state Table 2-E emissions are 21.9 TPY, and the number of scheduled SSM events result in annual emissions of 31.9 TPY, enter 10.0 TPY in the table below.

[2] **Condensable Particulate Matter:** Include condensable particulate matter emissions for PM10 and PM2.5 if the source is a combustion source. Do not include condensable particulate matter for PM unless PM is set equal to PM10 and PM2.5. Particulate matter (PM) is not subject to an ambient air quality standard, but it is a regulated air pollutant under PSD (20.2.74 NMAC) and Title V (20.2.70 NMAC).

[3] Flare Malfunction pph emission rates reflect worst case emissions modeled for this unit. Flare Malfunction pph rates are maximums allowed for this unit and not additive with Flare SSM pph rates or Flare Process emission rates in Table 106.A.

"*" Denotes an hourly emission rate is not appropriate

Table 2-G: Stack Exit and Fugitive Emission Rates for Special Stacks

☑ I have elected to leave this table blank because this facility does not have any stacks/vents that split emissions from a single source or combine emissions from more than one source listed in table 2-A. Additionally, the emission rates of all stacks match the Requested allowable emission rates stated in Table 2-E.

Use this table to list stack emissions (requested allowable) from split and combined stacks. List Toxic Air Pollutants (TAPs) and Hazardous Air Pollutants (HAPs) in Table 2-I. List all fugitives that are associated with the normal, routine, and non-emergency operation of the facility. Unit and stack numbering must correspond throughout the application package. Refer to Table 2-E for instructions on use of the "-" symbol and on significant figures.

Stack No.	Serving Unit Number(s) from Table 2-A	NOx		CO		VOC		SOx		PM		PM10		PM2.5		☐ H_2S or ☐Lead	
		lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
N/A																	
Totals:																	

Table 2-H: Stack Exit Conditions

Unit and stack numbering must correspond throughout the application package. Include the stack exit conditions for each unit that emits from a stack, including blowdown venting parameters and tank emissions. If the facility has multiple operating scenarios, complete a separate Table 2-H for each scenario and, for each, type scenario name here:

Stack Number	Serving Unit Number(s) from Table 2-A	Orientation (H=Horizontal V=Vertical)	Rain Caps (Yes or No)	Height Above Ground (ft)	Temp. (F)	Flow Rate		Moisture by Volume (%)	Velocity (ft/sec)	Inside Diameter (ft)
						(acfs)	(dscfs)			
Engine	ENG-2	Vertical	No	30.4	1019	143	-	-	134.08	1.17
Engine	ENG-3	Vertical	No	40.0	840	512	-	-	163.00	2.00
Engine	ENG-5	Vertical	No	40.0	841	512	-	-	289.75	2.00
Engine	GEN-1	Vertical	No	30.0	918	195	-	-	110.00	1.50
Engine	GEN-2	Vertical	No	30.0	918	195	-	-	110.00	1.50
Engine	GEN-3	Vertical	No	30.0	918	195	-	-	110.00	1.50
Engine	GEN-4	Vertical	No	30.0	918	195	-	-	110.00	1.50
Engine	GEN-5	Vertical	No	30.0	918	195	-	-	110.00	1.50
Heater	GR-1, DHY-1	Vertical	No	20.0	403.2	5	-	-	35.30	0.50
Heater	AR-1	Vertical	No	30.0	368	189	-	-	106.70	1.50
Flare	F-7005	Vertical	No	30.0	1832	322	-	-	65.60	2.50
Flare	F-400, T-800, T-801	Vertical	No	25.0	1832	322	-	-	65.60	2.50
Thermal Oxidizer	TO-1	Vertical	No	55.0	1500	975	-	-	361.30	4.50

Table 2-I: Stack Exit and Fugitive Emission Rates for HAPs and TAPs

In the table below, report the Potential to Emit for each HAP from each regulated emission unit listed in Table 2-A, only if the entire facility emits the HAP at a rate greater than or equal to one (1) ton per year For each such emission unit, HAPs shall be reported to the nearest 0.1 tpy. Each facility-wide Individual HAP total and the facility-wide Total HAPs shall be the sum of all HAP sources calculated to the nearest 0.1 ton per year. Per 20.2.72.403.A.1 NMAC, facilities not exempt [see 20.2.72.402.C NMAC] from TAP permitting shall report each TAP that has an uncontrolled emission rate in excess of its pounds per hour screening level specified in 20.2.72.502 NMAC. TAPs shall be reported using one more significant figure than the number of significant figures shown in the pound per hour threshold corresponding to the substance. Use the HAP nomenclature as it appears in Section 112 (b) of the 1990 CAAA and the TAP nomenclature as it listed in 20.2.72.502 NMAC. Include tank-flashing emissions estimates of HAPs in this table. For each HAP or TAP listed, fill all cells in this table with the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected or the pollutant is emitted in a quantity less than the threshold amounts described above.

Stack No.	Unit No.(s)	Total HAPs		Acetaldehyde ☑ HAP or ☐ TAP		Benzene ☑ HAP or ☐ TAP		Ethylbenzene ☑ HAP or ☐ TAP		Formaldehyde ☑ HAP or ☐ TAP		n-Hexane ☑ HAP or ☐ TAP		Naphthalene ☑ HAP or ☐ TAP		Toluene ☑ HAP or ☐ TAP		Xylene ☑ HAP or ☐ TAP	
		lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
ENG-2	ENG-2	0.51	2.23	0.030	0.13	0.017	0.075	2.68E-04	1.18E-03	0.43	1.87	-	-	-	-	6.04E-03	0.026	2.11E-03	9.24E-03
ENG-3	ENG-3	0.90	3.96	0.31	1.34	0.020	0.070	1.46E-03	6.38E-03	0.33	1.45	0.040	0.18	-	-	0.010	0.070	6.75E-03	0.030
ENG-5	ENG-5	0.62	2.70	0.10	0.45	0.058	0.25	9.10E-04	3.98E-03	0.33	1.45	-	-	-	-	0.020	0.090	7.15E-03	0.031
GEN-1	GEN-1	1.09	1.59	0.13	0.19	6.98E-03	0.010	6.30E-04	9.19E-04	0.84	1.22	0.020	0.030	-	-	6.47E-03	9.45E-03	2.92E-03	4.26E-03
GEN-2	GEN-2	1.09		0.13		6.98E-03		6.30E-04		0.84		0.020		-		6.47E-03		2.92E-03	
GEN-3	GEN-3	1.09	2.93	0.13	0.36	6.98E-03	0.020	6.30E-04	1.70E-03	0.84	2.26	0.020	0.050	-	-	6.47E-03	0.020	2.92E-03	7.88E-03
GEN-4	GEN-4	1.09		0.13		6.98E-03		6.30E-04		0.84		0.020		-		6.47E-03		2.92E-03	
GEN-5	GEN-5	1.09		0.13		6.98E-03		6.30E-04		0.84		0.020		-		6.47E-03		2.92E-03	
DHY-1	DHY-1	0.17	0.75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GR-1	GR-1	6.06E-05	2.65E-04	-	-	1.54E-06	6.76E-06	-	-	5.51E-03	2.42E-04	-	-	4.49E-07	1.96E-06	2.50E-06	1.10E-05	-	-
T-800	T-800	1.60E-03	7.02E-03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T-801	T-801	1.60E-03	7.02E-03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AM-1	AM-1	1.69	7.42	-	-	0.67	2.92	-	-	-	-	-	-	-	-	-	-	-	-
AR-1	AR-1	2.91E-03	0.010	-	-	7.41E-05	3.25E-04	-	-	2.65E-03	0.010	-	-	2.15E-05	9.43E-05	1.20E-04	5.26E-04	-	-
F-7005	F-7005	4.50	0.54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F-400	F-400	1.22E-03	5.33E-03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-1	FUG-1	4.04E-03	0.020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-2	FUG-2	2.55E-03	0.010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TO-1	TO-1	3.10	4.76E-03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OILLOAD-1	OILLOAD-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals:		16.95	22.19	1.09	2.47	0.80	3.35	5.79E-03	0.014	5.29	8.25	0.14	0.26	2.19E-05	9.63E-05	0.069	0.22	0.031	0.083

Table 2-J: Fuel

Specify fuel characteristics and usage. Unit and stack numbering must correspond throughout the application package.

Unit No.	Fuel Type (low sulfur Diesel, ultra low sulfur diesel, Natural Gas, Coal, …)	Fuel Source: purchased commercial, pipeline quality natural gas, residue gas, raw/field natural gas, process gas (e.g. SRU tail gas) or other	Specify Units				
			Lower Heating Value	Hourly Usage	Annual Usage	% Sulfur	% Ash
ENG-2	Natural Gas	Residue Gas	1119	8814 scf/hr	77.21 MMscf/yr	N/A	N/A
ENG-3	Natural Gas	Residue Gas	1119	29875 scf/hr	261.70 MMscf/yr	N/A	N/A
ENG-5	Natural Gas	Residue Gas	1119	29875 scr/hr	261.70 MMscr/yr	N/A	N/A
GEN-1	Natural Gas	Residue Gas	1119	12916 scf/hr	113.14 MMscf/yr	N/A	N/A
GEN-2	Natural Gas	Residue Gas	1119	12916 scf/hr	41.38 MMscf/yr	N/A	N/A
GEN-3	Natural Gas	Residue Gas	1119	12916 scf/hr	41.38 MMscf/yr	N/A	N/A
GEN-4	Natural Gas	Residue Gas	1119	12916 scf/hr	41.38 MMscf/yr	N/A	N/A
GEN-5	Natural Gas	Residue Gas	1119	12916 scf/hr	41.38 MMscf/yr	N/A	N/A
GR-1	Natural Gas	Residue Gas (Wet Fuel Gas)	966	776 scf/hr	6.80 MMscf/yr	N/A	N/A
AR-1	Natural Gas	Residue Gas (Wet Fuel Gas)	966	37267 scf/hr	326.46 MMscf/yr	N/A	N/A
TO-1	Natural Gas	Residue Gas	1119	3568 scf/hr	31.26 MMscf/yr	N/A	N/A
F-7005	Natural Gas	Residue Gas (Wet Fuel Gas)	966	216 scf/hr	1.89 MMscf/yr	N/A	N/A
F-400	Natural Gas	Residue Gas	1119	47 scf/hr	0.41 MMscf/yr	N/A	N/A

Table 2-K: Liquid Data for Tanks Listed in Table 2-L

For each tank, list the liquid(s) to be stored in each tank. If it is expected that a tank may store a variety of hydrocarbon liquids, enter "mixed hydrocarbons" in the Composition column for that tank and enter the corresponding data of the most volatile liquid to be stored in the tank. If tank is to be used for storage of different materials, list all the materials in the "All Calculations" attachment, run the newest version of TANKS on each, and use the material with the highest emission rate to determine maximum uncontrolled and requested allowable emissions rate. The permit will specify the most volatile category of liquids that may be stored in each tank. Include appropriate tank-flashing modeling input data. Use additional sheets if necessary. Unit and stack numbering must correspond throughout the application package.

Tank No.	SCC Code	Material Name	Composition	Liquid Density (lb/gal)	Vapor Molecular Weight (lb/lb*mol)	Average Storage Conditions		Max Storage Conditions	
						Temperature (°F)	True Vapor Pressure (psia)	Temperature (°F)	True Vapor Pressure (psia)
800/801		Slop Oil	Calculations used Gasoline RVP 12 as representative product	5.6	64	69	7.6	90.05	10.87

Table 2-L: Tank Data

Include appropriate tank-flashing modeling input data. Use an addendum to this table for unlisted data categories. Unit and stack numbering must correspond throughout the application package. Use additional sheets if necessary. See reference Table 2-L2. Note: 1.00 bbl = 10.159 M3 = 42.0 gal

Tank No.	Date Installed	Materials Stored	Seal Type (refer to Table 2-LR below)	Roof Type (refer to Table 2-LR below)	Capacity		Diameter (M)	Vapor Space (M)	Color (from Table VI-C)		Paint Condition (from Table VI-C)	Annual Throughput (gal/yr)	Turn-overs (per year)
					(bbl)	(M^3)			Roof	Shell			
T-800	March 2019	Slop Oil			500		4.72		Tan	Tan		720,500	34.30
T-801	March 2019	Slop Oil			500		4.72		Tan	Tan		720,500	34.30

Table 2-L2: Liquid Storage Tank Data Codes Reference Table

Roof Type	Seal Type, Welded Tank Seal Type		Seal Type, Riveted Tank Seal Type		Roof, Shell Color	Paint Condition
FX: Fixed Roof	**Mechanical Shoe Seal**	**Liquid-mounted resilient seal**	**Vapor-mounted resilient seal**	**Seal Type**	**WH**: White	Good
IF: Internal Floating Roof	**A**: Primary only	**A**: Primary only	**A**: Primary only	**A**: Mechanical shoe, primary only	**AS**: Aluminum (specular)	Poor
EF: External Floating Roof	**B**: Shoe-mounted secondary	**B**: Weather shield	**B**: Weather shield	**B**: Shoe-mounted secondary	**AD**: Aluminum (diffuse)	
P: Pressure	**C**: Rim-mounted secondary	**C**: Rim-mounted secondary	**C**: Rim-mounted secondary	**C**: Rim-mounted secondary	**LG**: Light Gray	
					MG: Medium Gray	
					BL: Black	
					OT: Other (specify)	

Note: 1.00 bbl = 0.159 M^3 = 42.0 gal

Table 2-M: Materials Processed and Produced (Use additional sheets as necessary.)

Material Processed				Material Produced			
Description	**Chemical Composition**	**Phase (Gas, Liquid, or Solid)**	**Quantity (specify units)**	**Description**	**Chemical Composition**	**Phase**	**Quantity (specify units)**
N/A							

Table 2-N: CEM Equipment

Enter Continuous Emissions Measurement (CEM) Data in this table. If CEM data will be used as part of a federally enforceable permit condition, or used to satisfy the requirements of a state or federal regulation, include a copy of the CEM's manufacturer specification sheet in the Information Used to Determine Emissions attachment. Unit and stack numbering must correspond throughout the application package. Use additional sheets if necessary.

Stack No.	Pollutant(s)	Manufacturer	Model No.	Serial No.	Sample Frequency	Averaging Time	Range	Sensitivity	Accuracy
N/A									

Table 2-O: Parametric Emissions Measurement Equipment

Unit and stack numbering must correspond throughout the application package. Use additional sheets if necessary.

Unit No.	Parameter/Pollutant Measured	Location of Measurement	Unit of Measure	Acceptable Range	Frequency of Maintenance	Nature of Maintenance	Method of Recording	Averaging Time
N/A								

Table 2-P: Greenhouse Gas Emissions

Applications submitted under 20.2.70, 20.2.72, & 20.2.74 NMAC are required to complete this Table. Power plants, Title V major sources, and PSD major sources must report and calculate all GHG emissions for each unit. Applicants must report potential emission rates in short tons per year (see Section 6.a for assistance). Include GHG emissions during Startup, Shutdown, and Scheduled Maintenance in this table. For minor source facilities that are not power plants, are not Title V, or are not PSD, there are three options for reporting GHGs 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 GHG as a second separate unit; OR 3) check the following box.

☐ By checking this box, the applicant acknowledges the total CO2e emissions are less than 75,000 tons per year.

		CO_2 ton/yr	N_2O ton/yr	CH_4 ton/yr	SF_6 ton/yr	PFC/HFC ton/yr[2]										Total GHG Mass Basis ton/yr[4]	Total CO_2e ton/yr[5]
Unit No.	**GWPs [1]**	**1**	**298**	**25**	**22,800**	**footnote 3**											
ENG-2	**mass GHG**	5,054.04	9.53E-03	0.095	-	-										5,054.15	
	CO2e	5,054.04	2.84	2.38	-	-											5,059.26
ENG-3	**mass GHG**	17,674.93	0.040	0.22	-	-										17,675.19	
	CO2e	17,674.93	13.06	5.48	-	-											17,693.47
ENG-5	**mass GHG**	17,130.75	0.032	0.32	-	-										17,131.11	
	CO2e	17,130.75	9.62	8.07	-	-											17,148.44
GEN-1	**mass GHG**	2,547.25	-	0.030	-	-										2,547.28	
	CO2e	2,547.25	-	0.79	-	-											2,548.04
GEN-2	**mass GHG**	-	-	-	-	-										-	
	CO2e	-	-	-	-	-											-
GEN-3	**mass GHG**	-	-	-	-	-										-	
	CO2e	-	-	-	-	-											-
GEN-4	**mass GHG**	-	-	-	-	-										-	
	CO2e	-	-	-	-	-											-
GEN-5	**mass GHG**	-	-	-	-	-										-	
	CO2e	-	-	-	-	-											-
GEN-CAP	**mass GHG**	4,710.67	0.030	0.060	-	-										4,710.76	
	CO2e	4,710.67	8.02	1.46	-	-											4,720.15
TO-1	**mass GHG**	2,075.92	0.040	0.040	-	-										2,076.00	
	CO2e	2,075.92	11.29	0.99	-	-											2,088.20
GR-1	**mass GHG**	386.47	0.010	0.010	-	-										386.49	
	CO2e	386.47	2.11	0.19	-	-											388.77
AR-1	**mass GHG**	18,550.59	0.34	0.36	-	-										18,551.29	
	CO2e	18,550.59	101.35	8.89	-	-											18,660.83
F-7005	**mass GHG**	1,879.98	0.030	0.040	-	-										1,880.05	
	CO2e	1,879.89	10.32	0.90	-	-											1,891.11
F-400	**mass GHG**	49.80	-	-	-	-										49.80	
	CO2e	49.80	0.27	0.02	-	-											50.09
	mass GHG																
	CO2e																
Total	**mass GHG**	70,060.40	0.53	1.18	-	-										70,062.11	
	CO2e	70,060.31	158.88	29.17	-	-											70,248.36

[1] **GWP** (Global Warming Potential): Applicants must use the most current GWPs codified in Table A-1 of 40 CFR part 98. GWPs are subject to change, therefore, applicants need to check 40 CFR 98 to confirm GWP values.

[2] For **HFCs** or **PFCs** describe the specific HFC or PFC compound and use a separate column for each individual compound.

[3] For each new compound, enter the appropriate GWP for each HFC or PFC compound from Table A-1 in 40 CFR 98.

[4] Green house gas emissions on a **mass basis** is the ton per year green house gas emission before adjustment with its GWP.

[5] **CO_2e** means Carbon Dioxide Equivalent and is calculated by multiplying the TPY mass emissions of the green house gas by its GWP.

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.

Northwind Midstream Partners, LLC (Northwind) is submitting this application for a significant revision to NSR Permit No. 7747-M4R1 pursuant 20.2.72.203.A. NMAC. The facility is located in Lea County, New Mexico. With this application Northwind is proposing to add (1) Caterpillar 3516B engine (ENG-2) to the facility. Titan Treater Plant #1 receives sour natural gas from pipelines and treats it to remove acid gas (CO_2 and H_2S) and water. The treated gas is compressed and sent-off site via pipeline.

Field gas enters the facility and condensed liquids are separated at the knock-out vessel. Liquids are sent to two 500 storage tanks (T-800/801) where it is stored. The inlet gas is compressed in three compressors operated by gas engines (ENG-2, ENG-3, & ENG-5) as needed to achieve required operating pressure and for pipeline transport off-site. After compression, the inlet gas is sent to an amine treatment and regeneration unit (AM-1), which uses methyl diethanolamine (MDEA) to remove acid gases carbon dioxide (CO_2) and hydrogen sulfide (H_2S) from the gas stream. The amine treater includes a hot oil loop and a reboiler (AR-1) providing heat to the regeneration column. Wet fuel gas from the amine system is used as fuel in the reboiler AR-1. The acid gas stream from the amine unit regeneration column flash tank, rich in H_2S and CO_2, is sent to the AGI system for underground disposal.

Sweet wet gas from the amine unit is sent to a glycol dehydration unit (DHY-1). The glycol unit includes a gas-fired reboiler (GR-1) for supplying heat to the system. Wet fuel gas from the amine system is used as fuel for GR-1. The emissions from the glycol unit flash tank and regeneration column are controlled by a condenser and remaining emissions are routed to the reboiler GR-1 for combustion and control. Liquids from compressor interstage knockout and other knock-out vessels are sent to the 500 bbl tanks (T-800/801). An intermediate flash vessel upstream of the tanks reduces potential flashing emissions from the tanks. The gas from the intermediate flash vessel is routed to the main process flare (F-7005), which also controls SSM gas streams in case of failure of existing process equipment. Wet fuel gas from the amine system is used as fuel in F-7005 supplemented by pipeline quality natural gas as necessary. A natural-gas generator engine (GEN-1) provides power for site equipment besides the AGI system.

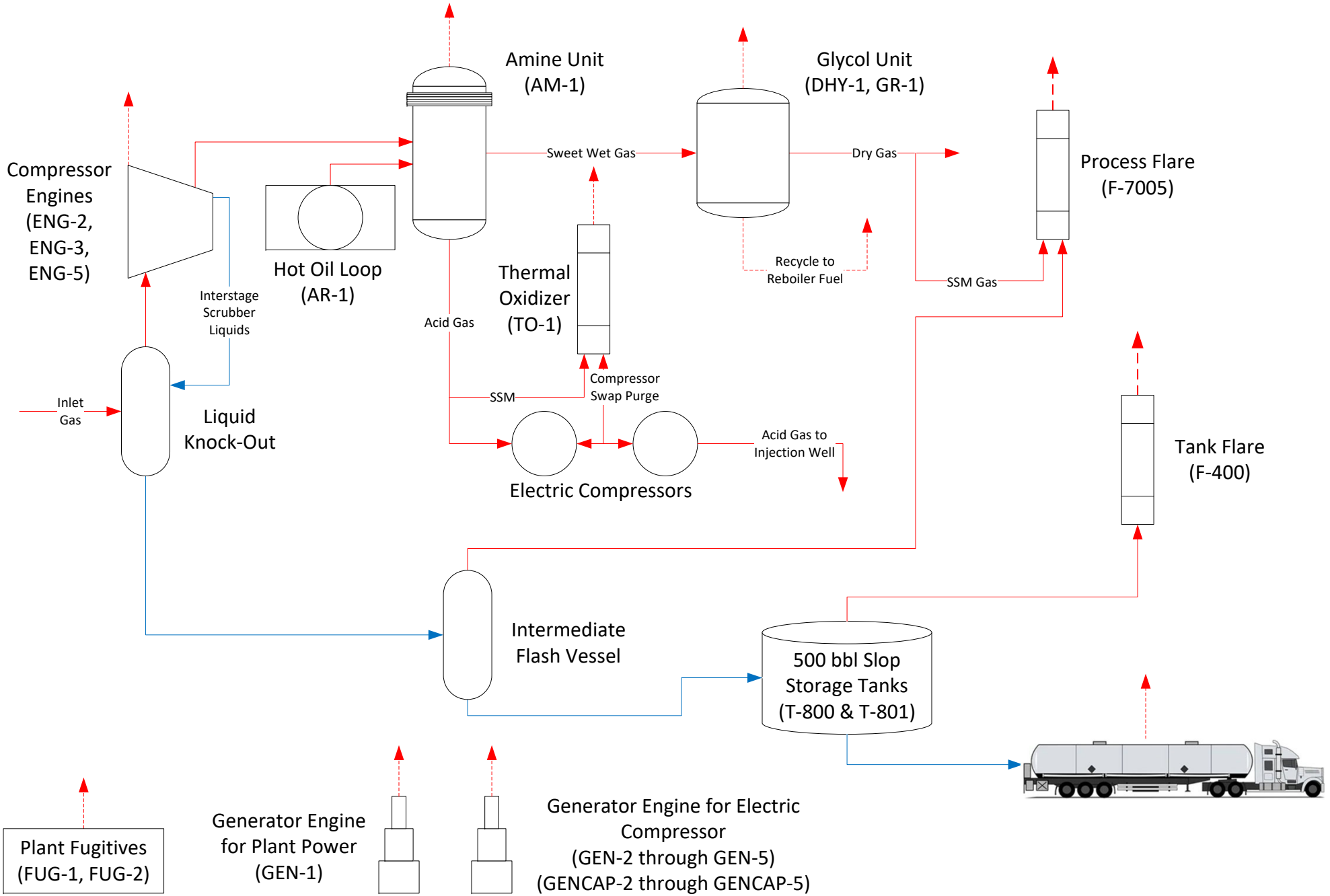
The AGI system will use two electric compressors for acid gas injection to the underground acid gas well. Normally, one electric compressor will run at any time. The compressors will be powered by four (4) fuel gas fired generators (GEN-2 through GEN-5). During routine operation, the electric compressor will be powered by two out of the four generators operating at approximately 60% load. At times, when compressor load balancing is necessary, the compressors will be swapped in operation. During the swap, the residual acid gas vapors trapped in the line between the compressors will be vented and combusted in a thermal oxidizer (TO-1). The thermal oxidizer (TO-1) will always be operated in idle mode (except during shutdown of the plant), in order to be ready to accept the low heat content acid gases vented to the unit and to ensure adequate combustion of the acid gas. The thermal oxidizer will use fuel gas generated at the site for combustion.

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 of the facility has been attached on the following page.



Northwind Midstream Partners, LLC

Legend:

- Emissions
- Gas
- Liquid

PROCESS FLOW DIAGRAM

Titan Treater Plant #1

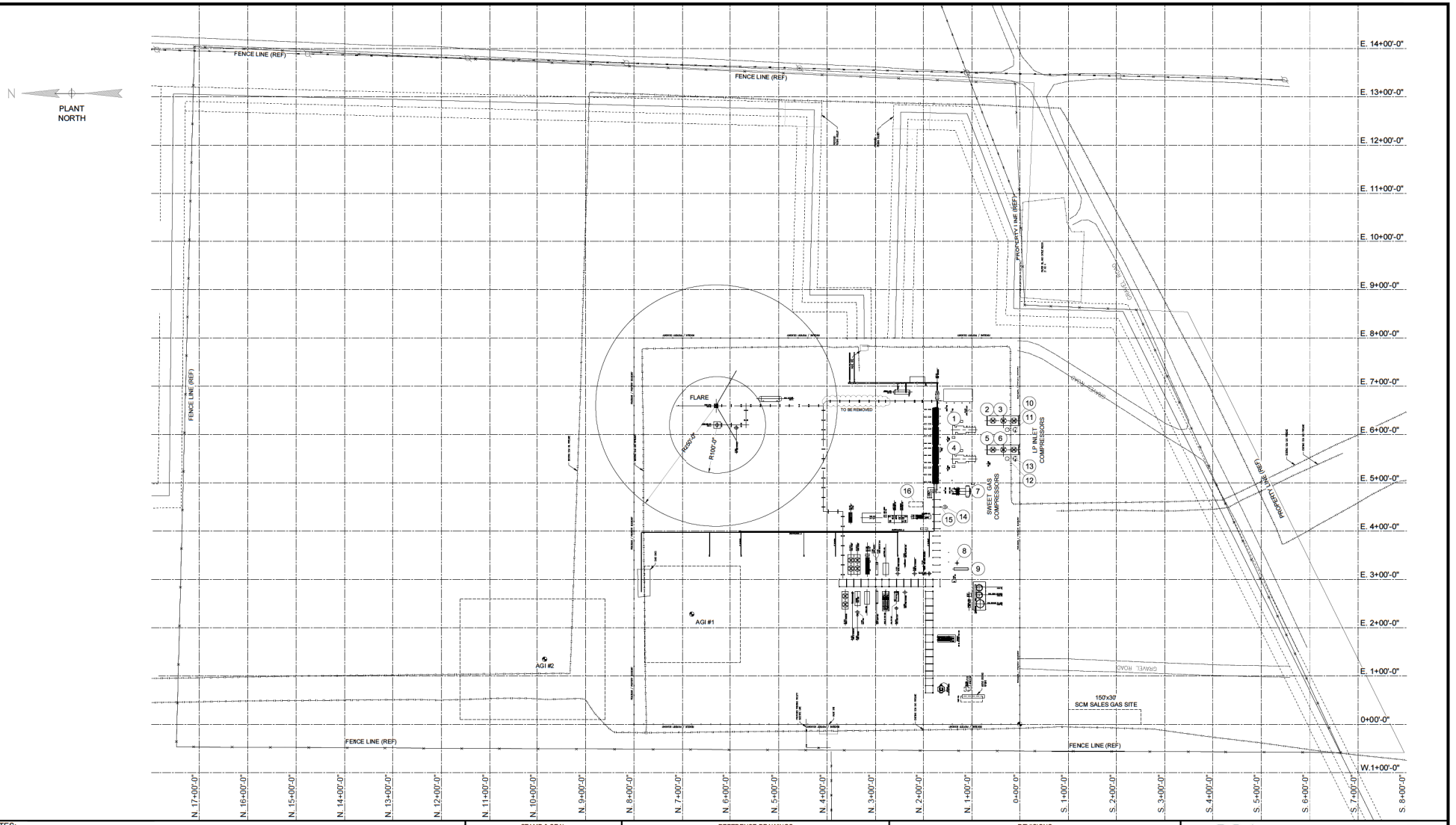
December 2023

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 of the entire facility has been attached on the following page.



NOTES:

STAMP & SEAL

REFERENCE DRAWINGS

NO.	TITLE
D-10991-C03-101	EQUIPMENT LEGEND

REVISIONS

NO.	FIRM	DATE	DESCRIPTION	BY	CHK.	APP.
0	SI	8/4/23	ISSUED FOR CONSTRUCTION	LRI	SSR	DW

SAULSBURY
ENGINEERING SERVICES
SAULSBURY.COM
TEXAS REGISTERED ENGINEERING FIRM F-518

ENGINEERING RECORD

PROJ. MANAGER:	MF	SI JOB NUMBER:	10991
PROJ. ENGR:	DW		
PROJ. DESIGN:	LRI		

NORTHWIND MIDSTREAM

TITAN TREATER - PLANT #1
200 MMSCFD GAS TREATING FACILITY
PLOT PLAN
PHASE 0
JAL, NM

DWG. NO. D-10991-C03-100

REV 0

J:\Northwind Midstream (EVX)\10991-01 Northwind Titan Treater\03 ENGINEERING, DESIGN\3.4 Piping\3.4.3 Drawings - Plot Plans\D-10991-C03-100 (8/4/2023 11:44:22 AM)

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.

This section contains the following calculations for this facility. Supporting documentation for these calculations can be found in Section 7.

Subsection 1 – Emission calculations for units either added or modified with this application.

Caterpillar Engines (Units ENG-2)

NO_X, CO, VOC, and formaldehyde 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, $PM_{2.5}$, and PM_{10}) 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.

Subsection 2 – Emission calculations for all other units at this facility not affected by this application. A description of the emission calculations is provided for all units added or modified at this facility since Northwind's acquisition.

Caterpillar Engines (Units ENG-5)

NO_X, CO, VOC, and formaldehyde 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, $PM_{2.5}$, and PM_{10}) 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.

Section 6

Subsection 1 - Emission Calculations for Units either Added or Modified with this Application

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For clarity, this Subsection 1 contains emission calculations for units that were either added or modified with this application (i.e. Units ENG-2). For all other emission calculations pertinent to the other units at this facility, please refer to Section 6 Subsection 2.

Northwind Midstream Partners, LLC - Titan Treater Plant #1

Compressor Engine Emissions

Maximum Uncontrolled Emissions																
Equipment	**NO_x**		**CO**		**VOC**		**SO_x**		**PM**		**PM_{10}**		**$PM_{2.5}$**		**H_2S**	
	lb/hr	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
ENG-2	1.52	6.66	7.21	31.58	2.59	11.33	0.050	0.22	0.099	0.43	0.099	0.43	0.099	0.43	-	-
ENG-3	5.50	24.09	25.08	109.85	3.08	13.49	0.020	0.090	-	-	0.36	1.59	0.36	1.59	-	-
ENG-5	5.51	24.14	25.13	110.08	5.39	23.62	0.020	0.086	0.33	1.46	0.33	1.46	0.33	1.46	-	-
GEN-1	3.94	17.27	8.14	35.64	2.00	8.77	8.70E-03	0.040	-	-	0.14	0.63	0.14	0.63	-	-
GEN-2	3.94		8.10		2.00		8.70E-03		-	-	0.14		0.14		-	
GEN-3	3.94	10.60	8.10	21.97	2.00	5.40	8.70E-03	0.020	-	-	0.14	0.39	0.14	0.39	-	-
GEN-4	3.94		8.10		2.00		8.70E-03		-	-	0.14		0.14		-	
GEN-5	3.94		8.10		2.00		8.70E-03		-	-	0.14		0.14		-	
DHY-1	-	-	-	-	12.92	56.60	-	-	-	-	-	-	-	-	6.00E-04	2.60E-03
GR-1	0.070	0.32	0.060	0.27	4.04E-03	0.020	4.41E-04	1.93E-03	-	-	5.59E-03	0.020	5.59E-03	0.020	-	-
T-800	-	-	-	-	1.60	7.02	-	-	-	-	-	-	-	-	0.080	0.35
T-801	-	-	-	-	1.60	7.02	-	-	-	-	-	-	-	-	0.080	0.35
AM-1	-	-	-	-	91.82	402.19	-	-	-	-	-	-	-	-	-	-
AR-1	3.53	15.46	2.96	12.99	0.19	0.85	0.020	0.090	-	-	0.27	1.17	0.27	1.17	-	-
F-7005	0.050	0.22	0.13	0.58	0.22	0.95	3.62E-04	1.59E-03	-	-	-	-	-	-	3.69E-06	1.62E-05
F-400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-1	-	-	-	-	0.32	1.38	-	-	-	-	-	-	-	-	4.04E-03	0.020
FUG-2	-	-	-	-	0.20	0.87	-	-	-	-	-	-	-	-	2.55E-03	0.010
TO-1	1.10	2.42	0.64	1.40	-	-	116.28	0.20	-	-	0.060	0.13	0.060	0.13	0.060	1.04E-04
OILLOAD-1	-	-	-	-	37.30	2.80	-	-	-	-	-	-	-	-	-	-
Total	**36.98**	**101.18**	**101.75**	**324.36**	**167.23**	**542.31**	**116.43**	**0.75**	**0.43**	**1.89**	**1.83**	**5.82**	**1.83**	**5.82**	**0.23**	**0.73**

Maximum Controlled Emissions

Equipment	NO_x		CO		VOC		SO_x		PM		PM_{10}		$PM_{2.5}$		H_2S	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
ENG-2	1.52	6.66	1.80	7.86	1.76	7.73	0.050	0.22	0.099	0.43	0.099	0.43	0.099	0.43	-	-
ENG-3	5.50	24.09	1.76	7.71	0.88	3.85	0.020	0.090	-	-	0.36	1.59	0.36	1.59	-	-
ENG-5	0.55	2.41	1.52	6.67	1.31	5.76	0.020	0.086	0.33	1.46	0.33	1.46	0.33	1.46	-	-
GEN-1	3.94	17.27	8.14	35.64	2.00	8.77	8.70E-03	0.040	-	-	0.14	0.63	0.14	0.63	-	-
GEN-2	3.94		8.10		2.00		8.70E-03		-		0.14		0.14		-	
GEN-3	3.94	10.60	8.10	21.97	2.00	5.40	8.70E-03	0.020	-	-	0.14	0.39	0.14	0.39	-	-
GEN-4	3.94		8.10		2.00		8.70E-03		-		0.14		0.14		-	
GEN-5	3.94		8.10		2.00		8.70E-03		-		0.14		0.14		-	
DHY-1	-	-	-	-	0.26	1.13	-	-	-	-	-	-	-	-	1.20E-05	5.20E-05
GR-1	0.070	0.32	0.060	0.27	4.04E-03	0.020	4.41E-04	1.93E-03	-	-	5.59E-03	0.020	5.59E-03	0.020	-	-
T-800	-	-		-	0.030	0.14	-	-	-	-	-	-	-	-	1.60E-03	7.02E-03
T-801	-	-	-	-	0.030	0.14	-	-	-	-	-	-	-	-	1.60E-03	7.02E-03
AM-1	-	-	-	-	1.84	8.04	-	-	-	-	-	-	-	-	-	-
AR-1	3.53	15.46	2.96	12.99	0.19	0.85	0.020	0.090	-	-	0.27	1.17	0.27	1.17	-	-
F-7005	0.050	0.22	0.13	0.58	0.22	0.95	3.62E-04	1.59E-03	-	-	-	-	-	-	3.69E-06	1.62E-05
F-7005 SSM	16.66	0.20	44.68	5.36	125.63	15.08	414.15	49.70	-	-	-	-	-	-	4.50	0.54
F-400	0.010	0.060	0.040	0.16	0.070	0.32	6.48E-04	2.84E-03	-	-	-	-	-	-	1.22E-03	5.33E-03
FUG-1	-	-	-	-	0.32	1.38	-	-	-	-	-	-	-	-	4.04E-03	0.020
FUG-2	-	-	-	-	0.20	0.87	-	-	-	-	-	-	-	-	2.55E-03	0.010
TO-1	1.10	2.42	0.64	1.40	-	-	116.28	0.20	-	-	0.060	0.13	0.060	0.13	0.060	1.04E-04
TO-1 SSM	4.00	4.83E-03	2.32	2.80E-03	-	-	5,814.78	8.74	-	-	0.22	2.61E-04	0.22	2.61E-04	3.10	4.65E-03
OILLOAD-1	-	-	-	-	37.30	2.80	-	-	-	-	-	-	-	-	-	-
Malfunction	-	-	-	-	-	10.00	-	-	-	-	-	-	-	-	-	-
Total	**52.69**	**79.72**	**96.45**	**100.61**	**180.05**	**73.23**	**6,345.36**	**59.19**	**0.43**	**1.89**	**2.05**	**5.82**	**2.05**	**5.82**	**7.67**	**0.59**

Controlled HAP Emissions

Equipment	Total HAPs		Acetaldehyde		Benzene		Ethylbenzene		Formaldehyde		n-Hexane		Naphthalene		Toluene		Xylene		CO2e
	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	tpy
ENG-2	0.51	2.23	0.030	0.13	0.017	0.075	2.68E-04	1.18E-03	0.43	1.87	-	-	-	-	6.04E-03	0.026	2.11E-03	9.24E-03	5,059.26
ENG-3	0.90	3.96	0.31	1.34	0.020	0.070	1.46E-03	6.38E-03	0.33	1.45	0.040	0.18	-	-	0.010	0.070	6.75E-03	0.030	17,693.47
ENG-5	0.62	2.70	0.10	0.45	0.058	0.25	9.10E-04	3.98E-03	0.33	1.45	-	-	-	-	0.020	0.090	7.15E-03	0.031	17,148.44
GEN-1	1.09	1.59	0.13	0.19	6.98E-03	0.010	6.30E-04	9.19E-04	0.84	1.22	0.020	0.030	-	-	6.47E-03	9.45E-03	2.92E-03	4.26E-03	2,548.04
GEN-2	1.09		0.13		6.98E-03		6.30E-04		0.84		0.020		-		6.47E-03		2.92E-03		
GEN-3	1.09	2.93	0.13	0.36	6.98E-03	0.020	6.30E-04	1.70E-03	0.84	2.26	0.020	0.050	-	-	6.47E-03	0.020	2.92E-03	7.88E-03	4,720.15
GEN-4	1.09		0.13		6.98E-03		6.30E-04		0.84		0.020		-		6.47E-03		2.92E-03		
GEN-5	1.09		0.13		6.98E-03		6.30E-04		0.84		0.020		-		6.47E-03		2.92E-03		
DHY-1	0.17	0.75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GR-1	6.06E-05	2.65E-04	-	-	1.54E-06	6.76E-06	-	-	5.51E-03	2.42E-04	-	-	4.49E-07	1.96E-06	2.50E-06	1.10E-05	-	-	388.77
T-800	1.60E-03	7.02E-03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T-801	1.60E-03	7.02E-03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AM-1	1.69	7.42	-	-	0.67	2.92	-	-	-	-	-	-	-	-	-	-	-	-	-
AR-1	2.91E-03	0.010	-	-	7.41E-05	3.25E-04	-	-	2.65E-03	0.010	-	-	2.15E-05	9.43E-05	1.20E-04	5.26E-04	-	-	18,660.83
F-7005	4.50	0.54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,891.11
F-400	1.22E-03	5.33E-03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50.09
FUG-1	4.04E-03	0.020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-2	2.55E-03	0.010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TO-1	3.10	4.76E-03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,088.20
OILLOAD-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	**16.95**	**22.19**	**1.09**	**2.47**	**0.80**	**3.35**	**5.79E-03**	**0.014**	**5.29**	**8.25**	**0.140**	**0.26**	**2.19E-05**	**9.63E-05**	**0.069**	**0.22**	**0.031**	**0.083**	**70,248.36**

Northwind Midstream Partners, LLC - Titan Treater Plant #1

Compressor Engine Emissions

Unit:	ENG-2		
Model:	CAT G3516B Compressor Engine	4SLB	
	1380 hp	Mfg. specs	
Fuel Consumption:	7148 Btu/hp-hr	Mfg. specs	
Fuel Heating Value:	1119.17 Btu/scf	Facility Specific	
Daily Fuel Usage:	211533 scf/day	Calculated	
Hourly Fuel Usage:	8814 scf/hr	Hourly Fuel Consumption	
Annual Fuel Usage:	77.21 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	2.37	0.43		0.032	0.41								g/hp-hr
							3.06E-03	2.89E-03	1.73E-03	2.72E-05	6.12E-04	2.14E-04		lb/MMBtu
				0.02										gr/scf
Hourly Totals	1.52	7.21	2.59	0.050	0.099	1.25	0.030	0.028	0.017	2.68E-04	6.04E-03	2.11E-03	1.33	lb/hr
Annual Totals	6.66	31.58	11.33	0.22	0.43	5.46	0.13	0.12	0.075	1.18E-03	0.026	9.24E-03	5.83	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	0.50	0.59	0.43		0.032	0.14								g/hp-hr
Percent Reduction	0%	75%	0%			66%								
							3.06E-03	2.89E-03	1.73E-03	2.72E-05	6.12E-04	2.14E-04		lb/MMBtu
				0.02										gr/scf
Hourly Totals	1.52	1.80	1.76	0.050	0.099	0.43	0.030	0.028	0.017	2.68E-04	6.04E-03	2.11E-03	0.51	lb/hr
Annual Totals	6.66	7.86	7.73	0.221	0.43	1.87	0.13	0.12	0.075	1.18E-03	0.026	9.24E-03	2.23	ton/yr

GHG Calculations

CO_2*	N_2O*	CH_4*	CO_2e*		
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
5,054.04	9.53E-03	0.095		tpy	Engine
5,054.04	2.84	2.38	5,059.26	tpy CO_2e	
		Total:	**5,059.26**	tpy CO2e	

* N_2O, CH_4, and CO_2 tpy Emission Rate= EF* Fuel Usage * Fuel Heat Value * 2.20462 lb/1 kg * 1 ton/2000 lb

CO_2e tpy Emission Rate = CO_2 Emission Rate* GWP Factor + N_2O Emission Rate*GWP Factor +CH_4 Emission Rate*GWP Factor

Notes

[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 0.02 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

Section 6

Subsection 2 - Emission Calculations for All Other Units at this Facility Not Affected by this Application

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For clarity, this Subsection 2 contains emission calculations for all other units at this facility that were not affected by this application (i.e. units except for Units ENG-2). For pertinent calculations relevant to the changes at the facility in this application, please refer to Section 6 Subsection 1.

Northwind Midstream Partners, LLC - Titan Treater Plant #1

Compressor Engine Emissions

Unit:	ENG-5		
Model:	CAT 3616 Compressor Engine		4SLB
	5000	hp	Mfg. specs
Fuel Consumption:	6687	Btu/hp-hr	Mfg. specs
Fuel Heating Value:	1119.17	Btu/scf	Facility Specific
Daily Fuel Usage:	716996	scf/day	Calculated
Hourly Fuel Usage:	29875	scf/hr	Hourly Fuel Consumption
Annual Fuel Usage:	261.70	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	2.28	0.28		0.030	0.20								g/hp-hr
				5.88E-04			3.06E-03	2.89E-03	1.73E-03	2.72E-05	6.12E-04	2.14E-04		lb/MMBtu
														gr/scf
Hourly Totals	5.51	25.13	5.39	0.020	0.33	2.20	0.10	0.10	0.058	9.10E-04	0.020	7.15E-03	2.49	lb/hr
Annual Totals	24.14	110.08	23.62	0.086	1.46	9.66	0.45	0.42	0.25	3.98E-03	0.090	0.031	10.91	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	0.05	0.14	0.08		0.030	0.03								g/hp-hr
Percent Reduction	90%	94%	71%			85%								
				5.88E-04			3.06E-03	2.89E-03	1.73E-03	2.72E-05	6.12E-04	2.14E-04		lb/MMBtu
														gr/scf
Hourly Totals	0.55	1.52	1.31	0.020	0.33	0.33	0.10	0.10	0.058	9.10E-04	0.020	7.15E-03	0.62	lb/hr
Annual Totals	2.41	6.67	5.76	0.086	1.46	1.45	0.45	0.42	0.25	3.98E-03	0.090	0.031	2.70	ton/yr

GHG Calculations

CO_2*	N_2O*	CH_4*	CO_2e*		
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
17130.75	0.03	0.32		tpy	Engine
17130.75	9.62	8.07	17148.44	tpy CO_2e	
		Total:	**17148.44**	tpy CO2e	

* N_2O, CH_4, and CO_2 tpy Emission Rate= EF* Fuel Usage * Fuel Heat Value * 2.20462 lb/1 kg * 1 ton/2000 lb

CO_2e tpy Emission Rate = CO_2 Emission Rate* GWP Factor + N_2O Emission Rate*GWP Factor +CH_4 Emission Rate*GWP Factor

Notes

[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 0.02 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

ENG-3 Emissions

Source Information

Parameter	Value	Units
Emission Unit ID:	ENG-3	
Engine Manufacturer:	Caterpillar	
Engine Model:	G3616	
Engine Type:	4SLB	
Fuel Type:	Field Gas	
Hours of Operation:	8760	hr/yr
Factory HP Rating:	5000	HP
Allowable HP Rating:	5000	HP
Engine BSFC:	6687	Btu/(HP*hr)
Fuel LHV:	1119.168	Btu/scf
Fuel Sulfur Content:	0.005	grains/dscf
Hourly Fuel Flow Rate:	0.032779	MMScf/hr
Annual Fuel Flow Rate:	287.14404	MMScf/yr
Maximum Engine RPM:	1000	RPM
Exhaust Temperature:	840	F
Exhaust Velocity:	163	ft/sec
Exhaust Flow:	30656	acfm
Stack Diameter:	2	ft
Stack Height:	40	ft

Uncontrolled Source Emissions

	Emission Factor		Emission Rates	
Pollutant	g/hp-hr [1]	lb/MMBtu [2]	lb/hr	tpy
NOx	0.50	-	5.50	24.09
CO	2.28	-	25.08	109.85
VOC	0.28	-	3.08	13.49
Formaldehyde	0.20	-	2.20	9.64
CO2	-	110.00	4,035.37	17,674.93
CH4	-	1.36E-03	0.05	0.22
N2O	-	2.73E-04	0.01	0.04
TSP/PM10/PM2.5	-	9.91E-03	0.36	1.59
SO2	-	5.88E-04	0.02	0.09
Acetaldehyde	-	8.36E-03	0.31	1.34
Acrolein	-	5.14E-03	0.19	0.83
Benzene	-	4.40E-04	0.02	0.07
Ethylbenzene	-	3.97E-05	1.46E-03	6.38E-03
n-Hexane	-	1.10E-03	0.04	0.18
Toluene	-	4.08E-04	0.01	0.07
Xylene	-	1.84E-04	6.75E-03	0.03
Total HAPs	-	-	2.77	12.15
Highest Single HAP (Formaldehyde)	-	-	2.20	9.64

Notes:
[1] Emission Factors NOx, CO, VOC, and Formaldehyde are from the manufacturer (Attachment 2-3).
[2] Particulate Matter, SO2 and various HAP emission rates were calculated using AP-42 emission rates from Table 3.2-2 (Attachment 2-7). GHG emission factors are from 40 CFR 98 Subpart C Table C-2 (Attachment 2-18)

Converstion Factors:
1 g = 0.0022 lb

Controlled Source Emissions

	Emission Factor		Emission Rates	
Pollutant	g/hp-hr [1]	lb/MMBtu [2]	lb/hr	tpy
NOx	0.50	-	5.50	24.09
CO	0.16	-	1.76	7.71
VOC	0.08	-	0.88	3.85
Formaldehyde	0.03	-	0.33	1.45
CO2	-	110.00	4,035.37	17,674.93
CH4	-	1.36E-03	0.05	0.22
N2O	-	2.73E-04	0.01	0.04
TSP/PM10/PM2.5	-	9.91E-03	0.36	1.59
SO2	-	5.88E-04	0.02	0.09
Acetaldehyde	-	8.36E-03	0.31	1.34
Acrolein	-	5.14E-03	0.19	0.83
Benzene	-	4.40E-04	0.02	0.07
Ethylbenzene	-	3.97E-05	1.46E-03	6.38E-03
n-Hexane	-	1.10E-03	0.04	0.18
Toluene	-	4.08E-04	0.01	0.07
Xylene	-	1.84E-04	6.75E-03	0.03
Total HAPs	-	-	0.90	3.96
Highest Single HAP (Formaldehyde)	-	-	0.33	1.45

Notes:
[1] Emission Factors NOx, CO, VOC, and Formaldehyde are from the manufacturer (Attachment 2-3).
[2] Particulate Matter, SO2 and various HAP emission rates were calculated using AP-42 emission rates from Table 3.2-2 (Attachment 2-7). GHG emission factors are from 40 CFR 98 Subpart C Table C-2 (Attachment 2-18)

Converstion Factors:
1 g = 0.0022 lb

GEN-1 Emissions

Source Information

Parameter	Value	Units
Emission Unit ID:	GEN-1	
Engine Manufacturer:	Caterpillar	
Engine Model:	G3516C	
Engine Type:	4SLB	
Fuel Type:	Field Gas	
Hours of Operation:	8760	hr/yr
Factory HP Rating:	1978	HP
Allowable HP Rating:	1978	HP
Engine BSFC:	7308	Btu/(HP*hr)
Fuel LHV:	1119.168	Btu/scf
Fuel Sulfur Content:	0.005	grains/dscf
Hourly Fuel Flow Rate:	0.014172	MMScf/hr
Annual Fuel Flow Rate:	41.38224	MMScf/yr
Maximum Engine RPM:	1800	RPM
Exhaust Temperature:	918	F
Exhaust Velocity:	110	ft/sec
Exhaust Flow:	11673	acfm
Stack Diameter:	1.5	ft
Stack Height:	30	ft

Uncontrolled Source Emissions

	Emission Factor		Emission Rate	
Pollutant	g/hp-hr [1]	lb/MMBtu [2]	lb/hr	tpy
NOx	0.91	-	3.94	17.27
CO	1.87	-	8.14	35.64
VOC	0.46	-	2.00	8.77
TSP/PM10/PM2.5	0.03	-	0.14	0.63
SO2	2.00E-03	-	8.70E-03	0.04
CO2	-	110.00	1,744.69	2,547.25
CH4	-	1.36E-03	0.02	0.03
N2O	-	2.73E-04	4.33E-03	6.32E-03
Formaldehyde	-	0.05	0.84	1.22
Acetaldehyde	-	8.36E-03	0.13	0.19
Acrolein	-	5.14E-03	0.08	0.12
Benzene	-	4.40E-04	6.98E-03	0.01
Ethylbenzene	-	3.97E-05	6.30E-04	9.19E-04
n-Hexane	-	1.10E-03	0.02	0.03
Toluene	-	4.08E-04	6.47E-03	9.45E-03
Xylene	-	1.84E-04	2.92E-03	4.26E-03
Total HAPs	-	-	1.09	1.59
Highest Single HAP (Formaldehyde)	-	-	0.84	1.22

Notes:

[1] Emission Factors NOx, CO, VOC, TSP/PM10/PM2.5, and SO2 are from the manufacturer (Attachment 2-5).

[2] Various HAP emission rates were calculated using AP-42 emission rates from Table 3.2-2 (Attachment 2-7). GHG emission factors are from 40 CFR 98 Subpart C Table C-2 (Attachment 2-18).

Converstion Factors:

1 g = 0.0022 lb

Controlled Source Emissions

	Emission Factor		Emission Rate	
Pollutant	g/hp-hr [1]	lb/MMBtu [2]	lb/hr	tpy
NOx	0.91	-	3.94	17.27
CO	1.87	-	8.14	35.64
VOC	0.46	-	2.00	8.77
TSP/PM10/PM2.5	0.03	-	0.14	0.63
SO2	2.00E-03	-	8.70E-03	0.04
CO2	-	110.00	1,744.69	2,547.25
CH4	-	1.36E-03	0.02	0.03
N2O	-	2.73E-04	4.33E-03	6.32E-03
Formaldehyde	-	0.05	0.84	1.22
Acetaldehyde	-	8.36E-03	0.13	0.19
Acrolein	-	5.14E-03	0.08	0.12
Benzene	-	4.40E-04	6.98E-03	0.01
Ethylbenzene	-	3.97E-05	6.30E-04	9.19E-04
n-Hexane	-	1.10E-03	0.02	0.03
Toluene	-	4.08E-04	6.47E-03	9.45E-03
Xylene	-	1.84E-04	2.92E-03	4.26E-03
Total HAPs	-	-	1.09	1.59
Highest Single HAP (Formaldehyde)	-	-	0.84	1.22

Notes:

[1] Emission Factors NOx, CO, VOC, TSP/PM10/PM2.5, and SO2 are from the manufacturer (Attachment 2-5).

[2] Various HAP emission rates were calculated using AP-42 emission rates from Table 3.2-2 (Attachment 2-7). GHG emission factors are from 40 CFR 98 Subpart C Table C-2 (Attachment 2-18).

GEN-2 Emissions

Source Information

Parameter	Value	Units
Emission Unit ID:	GEN-2	
Engine Manufacturer:	Caterpillar	
Engine Model:	G3516C	
Engine Type:	4SLB	
Fuel Type:	Field Gas	
Hours of Operation:	8760	hr/yr
Factory HP Rating:	1978	HP
Allowable HP Rating:	1978	HP
Engine BSFC:	7308	Btu/(HP*hr)
Fuel LHV:	1119.168	Btu/scf
Fuel Sulfur Content:	0.005	grains/dscf
Hourly Fuel Flow Rate:	0.014172	MMScf/hr
Annual Fuel Flow Rate:	41.38224	MMScf/yr
Maximum Engine RPM:	1800	RPM
Exhaust Temperature:	918	F
Exhaust Velocity:	110	ft/sec
Exhaust Flow:	11673	acfm
Stack Diameter:	1.5	ft
Stack Height:	30	ft

Uncontrolled Source Emissions

Pollutant	Emission Factor		Emission Rate	
	g/hp-hr [1]	lb/MMBtu [2]	lb/hr	tpy
NOx	0.91	-	3.94	17.27
CO	1.87	-	8.14	35.64
VOC	0.46	-	2.00	8.77
TSP/PM10/PM2.5	0.03	-	0.14	0.63
SO2	2.00E-03	-	8.70E-03	0.04
CO2	-	110.00	1,744.69	2,547.25
CH4	-	1.36E-03	0.02	0.03
N2O	-	2.73E-04	4.33E-03	6.32E-03
Formaldehyde	-	0.05	0.84	1.22
Acetaldehyde	-	8.36E-03	0.13	0.19
Acrolein	-	5.14E-03	0.08	0.12
Benzene	-	4.40E-04	6.98E-03	0.01
Ethylbenzene	-	3.97E-05	6.30E-04	9.19E-04
n-Hexane	-	1.10E-03	0.02	0.03
Toluene	-	4.08E-04	6.47E-03	9.45E-03
Xylene	-	1.84E-04	2.92E-03	4.26E-03
Total HAPs	-	-	1.09	1.59
Highest Single HAP (Formaldehyde)	-	-	0.84	1.22

Notes:

[1] Emission Factors NOx, CO, VOC, TSP/PM10/PM2.5, and SO2 are from the manufacturer (Attachment 2-5).

[2] Various HAP emission rates were calculated using AP-42 emission rates from Table 3.2-2 (Attachment 2-7). GHG emission factors are from 40 CFR 98 Subpart C Table C-2 (Attachment 2-18).

Converstion Factors:

1 g = 0.0022

Controlled Source Emissions

Pollutant	Emission Factor		Emission Rate	
	g/hp-hr [1]	lb/MMBtu [2]	lb/hr	tpy
NOx	0.91	-	3.94	17.27
CO	1.87	-	8.14	35.64
VOC	0.46	-	2.00	8.77
TSP/PM10/PM2.5	0.03	-	0.14	0.63
SO2	2.00E-03	-	8.70E-03	0.04
CO2	-	110.00	1,744.69	2,547.25
CH4	-	1.36E-03	0.02	0.03
N2O	-	2.73E-04	4.33E-03	6.32E-03
Formaldehyde	-	0.05	0.84	1.22
Acetaldehyde	-	8.36E-03	0.13	0.19
Acrolein	-	5.14E-03	0.08	0.12
Benzene	-	4.40E-04	6.98E-03	0.01
Ethylbenzene	-	3.97E-05	6.30E-04	9.19E-04
n-Hexane	-	1.10E-03	0.02	0.03
Toluene	-	4.08E-04	6.47E-03	9.45E-03
Xylene	-	1.84E-04	2.92E-03	4.26E-03
Total HAPs	-	-	1.09	1.59
Highest Single HAP (Formaldehyde)	-	-	0.84	1.22

Notes:

[1] Emission Factors NOx, CO, VOC, TSP/PM10/PM2.5, and SO2 are from the manufacturer (Attachment 2-5).

[2] Various HAP emission rates were calculated using AP-42 emission rates from Table 3.2-2 (Attachment 2-7). GHG emission factors are from 40 CFR 98 Subpart C Table C-2 (Attachment 2-18).

GEN-3 Emissions

Source Information

Parameter	Value	Units
Emission Unit ID:	GEN-3	
Engine Manufacturer:	Caterpillar	
Engine Model:	G3516C	
Engine Type:	4SLB	
Fuel Type:	Field Gas	
Hours of Operation:	8760	hr/yr
Factory HP Rating:	1978	HP
Allowable HP Rating:	1978	HP
Engine BSFC:	7308	Btu/(HP*hr)
Fuel LHV:	1119.168	Btu/scf
Fuel Sulfur Content:	0.005	grains/dscf
Hourly Fuel Flow Rate:	0.014172	MMScf/hr
Annual Fuel Flow Rate:	41.38224	MMScf/yr
Maximum Engine RPM:	1800	RPM
Exhaust Temperature:	918	F
Exhaust Velocity:	110	ft/sec
Exhaust Flow:	11673	acfm
Stack Diameter:	1.5	ft
Stack Height:	30	ft

Uncontrolled Source Emissions

Pollutant	Emission Factor		Emission Rate	
	g/hp-hr [1]	lb/MMBtu [2]	lb/hr	tpy
NOx	0.91	-	3.94	17.27
CO	1.87	-	8.14	35.64
VOC	0.46	-	2.00	8.77
TSP/PM10/PM2.5	0.03	-	0.14	0.63
SO2	2.00E-03	-	8.70E-03	0.04
CO2	-	110.00	1,744.69	2,547.25
CH4	-	1.36E-03	0.02	0.03
N2O	-	2.73E-04	4.33E-03	6.32E-03
Formaldehyde	-	0.05	0.84	1.22
Acetaldehyde	-	8.36E-03	0.13	0.19
Acrolein	-	5.14E-03	0.08	0.12
Benzene	-	4.40E-04	6.98E-03	0.01
Ethylbenzene	-	3.97E-05	6.30E-04	9.19E-04
n-Hexane	-	1.10E-03	0.02	0.03
Toluene	-	4.08E-04	6.47E-03	9.45E-03
Xylene	-	1.84E-04	2.92E-03	4.26E-03
Total HAPs	-	-	1.09	1.59
Highest Single HAP (Formaldehyde)	-	-	0.84	1.22

Notes:

[1] Emission Factors NOx, CO, VOC, TSP/PM10/PM2.5, and SO2 are from the manufacturer (Attachment 2-5).

[2] Various HAP emission rates were calculated using AP-42 emission rates from Table 3.2-2 (Attachment 2-7). GHG emission factors are from 40 CFR 98 Subpart C Table C-2 (Attachment 2-18).

Converstion Factors

1 g = 0.0022

Controlled Source Emissions

Pollutant	Emission Factor		Emission Rate	
	g/hp-hr [1]	lb/MMBtu [2]	lb/hr	tpy
NOx	0.91	-	3.94	17.27
CO	1.87	-	8.14	35.64
VOC	0.46	-	2.00	8.77
TSP/PM10/PM2.5	0.03	-	0.14	0.63
SO2	2.00E-03	-	8.70E-03	0.04
CO2	-	110.00	1,744.69	2,547.25
CH4	-	1.36E-03	0.02	0.03
N2O	-	2.73E-04	4.33E-03	6.32E-03
Formaldehyde	-	0.05	0.84	1.22
Acetaldehyde	-	8.36E-03	0.13	0.19
Acrolein	-	5.14E-03	0.08	0.12
Benzene	-	4.40E-04	6.98E-03	0.01
Ethylbenzene	-	3.97E-05	6.30E-04	9.19E-04
n-Hexane	-	1.10E-03	0.02	0.03
Toluene	-	4.08E-04	6.47E-03	9.45E-03
Xylene	-	1.84E-04	2.92E-03	4.26E-03
Total HAPs	-	-	1.09	1.59
Highest Single HAP (Formaldehyde)	-	-	0.84	1.22

Notes:

[1] Emission Factors NOx, CO, VOC, TSP/PM10/PM2.5, and SO2 are from the manufacturer (Attachment 2-5).

[2] Various HAP emission rates were calculated using AP-42 emission rates from Table 3.2-2 (Attachment 2-7). GHG emission factors are from 40 CFR 98 Subpart C Table C-2 (Attachment 2-18).

GEN-4 Emissions

Source Information

Parameter	Value	Units
Emission Unit ID:	GEN-4	
Engine Manufacturer:	Caterpillar	
Engine Model:	G3516C	
Engine Type:	4SLB	
Fuel Type:	Field Gas	
Hours of Operation:	8760	hr/yr
Factory HP Rating:	1978	HP
Allowable HP Rating:	1978	HP
Engine BSFC:	7308	Btu/(HP*hr)
Fuel LHV:	1119.168	Btu/scf
Fuel Sulfur Content:	0.005	grains/dscf
Hourly Fuel Flow Rate:	0.014172	MMScf/hr
Annual Fuel Flow Rate:	41.38224	MMScf/yr
Maximum Engine RPM:	1800	RPM
Exhaust Temperature:	918	F
Exhaust Velocity:	110	ft/sec
Exhaust Flow:	11673	acfm
Stack Diameter:	1.5	ft
Stack Height:	30	ft

Uncontrolled Source Emissions

	Emission Factor		Emission Rate	
Pollutant	g/hp-hr [1]	lb/MMBtu [2]	lb/hr	tpy
NOx	0.91	-	3.94	17.27
CO	1.87	-	8.14	35.64
VOC	0.46	-	2.00	8.77
TSP/PM10/PM2.5	0.03	-	0.14	0.63
SO2	2.00E-03	-	8.70E-03	0.04
CO2	-	110.00	1,744.69	2,547.25
CH4	-	1.36E-03	0.02	0.03
N2O	-	2.73E-04	4.33E-03	6.32E-03
Formaldehyde	-	0.05	0.84	1.22
Acetaldehyde	-	8.36E-03	0.13	0.19
Acrolein	-	5.14E-03	0.08	0.12
Benzene	-	4.40E-04	6.98E-03	0.01
Ethylbenzene	-	3.97E-05	6.30E-04	9.19E-04
n-Hexane	-	1.10E-03	0.02	0.03
Toluene	-	4.08E-04	6.47E-03	9.45E-03
Xylene	-	1.84E-04	2.92E-03	4.26E-03
Total HAPs	-	-	1.09	1.59
Highest Single HAP (Formaldehyde)	-	-	0.84	1.22

Notes:

[1] Emission Factors NOx, CO, VOC, TSP/PM10/PM2.5, and SO2 are from the manufacturer (Attachment 2-5).

[2] Various HAP emission rates were calculated using AP-42 emission rates from Table 3.2-2 (Attachment 2-7). GHG emission factors are from 40 CFR 98 Subpart C Table C-2 (Attachment 2-18).

Converstion Factors:

1 g = 0.0022 lb

Controlled Source Emissions

	Emission Factor		Emission Rate	
Pollutant	g/hp-hr [1]	lb/MMBtu [2]	lb/hr	tpy
NOx	0.91	-	3.94	17.27
CO	1.87	-	8.14	35.64
VOC	0.46	-	2.00	8.77
TSP/PM10/PM2.5	0.03	-	0.14	0.63
SO2	2.00E-03	-	8.70E-03	0.04
CO2	-	110.00	1,744.69	2,547.25
CH4	-	1.36E-03	0.02	0.03
N2O	-	2.73E-04	4.33E-03	6.32E-03
Formaldehyde	-	0.05	0.84	1.22
Acetaldehyde	-	8.36E-03	0.13	0.19
Acrolein	-	5.14E-03	0.08	0.12
Benzene	-	4.40E-04	6.98E-03	0.01
Ethylbenzene	-	3.97E-05	6.30E-04	9.19E-04
n-Hexane	-	1.10E-03	0.02	0.03
Toluene	-	4.08E-04	6.47E-03	9.45E-03
Xylene	-	1.84E-04	2.92E-03	4.26E-03
Total HAPs	-	-	1.09	1.59
Highest Single HAP (Formaldehyde)	-	-	0.84	1.22

Notes:

[1] Emission Factors NOx, CO, VOC, TSP/PM10/PM2.5, and SO2 are from the manufacturer (Attachment 2-5).

[2] Various HAP emission rates were calculated using AP-42 emission rates from Table 3.2-2 (Attachment 2-7). GHG emission factors are from 40 CFR 98 Subpart C Table C-2 (Attachment 2-18).

GEN-5 Emissions

Source Information

Parameter	Value	Units
Emission Unit ID:	GEN-5	
Engine Manufacturer:	Caterpillar	
Engine Model:	G3516C	
Engine Type:	4SLB	
Fuel Type:	Field Gas	
Hours of Operation:	8760	hr/yr
Factory HP Rating:	1978	HP
Allowable HP Rating:	1978	HP
Engine BSFC:	7308	Btu/(HP*hr)
Fuel LHV:	1119.168	Btu/scf
Fuel Sulfur Content:	0.005	grains/dscf
Hourly Fuel Flow Rate:	0.014172	MMScf/hr
Annual Fuel Flow Rate:	41.38224	MMScf/yr
Maximum Engine RPM:	1800	RPM
Exhaust Temperature:	918	F
Exhaust Velocity:	110	ft/sec
Exhaust Flow:	11673	acfm
Stack Diameter:	1.5	ft
Stack Height:	30	ft

Uncontrolled Source Emissions

Pollutant	Emission Factor		Emission Rate	
	g/hp-hr [1]	lb/MMBtu [2]	lb/hr	tpy
NOx	0.91	-	3.94	17.27
CO	1.87	-	8.14	35.64
VOC	0.46	-	2.00	8.77
TSP/PM10/PM2.5	0.03	-	0.14	0.63
SO2	2.00E-03	-	8.70E-03	0.04
CO2	-	110.00	1,744.69	2,547.25
CH4	-	1.36E-03	0.02	0.03
N2O	-	2.73E-04	4.33E-03	6.32E-03
Formaldehyde	-	0.05	0.84	1.22
Acetaldehyde	-	8.36E-03	0.13	0.19
Acrolein	-	5.14E-03	0.08	0.12
Benzene	-	4.40E-04	6.98E-03	0.01
Ethylbenzene	-	3.97E-05	6.30E-04	9.19E-04
n-Hexane	-	1.10E-03	0.02	0.03
Toluene	-	4.08E-04	6.47E-03	9.45E-03
Xylene	-	1.84E-04	2.92E-03	4.26E-03
Total HAPs	-	-	1.09	1.59
Highest Single HAP (Formaldehyde)	-	-	0.84	1.22

Notes:

[1] Emission Factors NOx, CO, VOC, TSP/PM10/PM2.5, and SO2 are from the manufacturer (Attachment 2-5).

[2] Various HAP emission rates were calculated using AP-42 emission rates from Table 3.2-2 (Attachment 2-7). GHG emission factors are from 40 CFR 98 Subpart C Table C-2 (Attachment 2-18).

Converstion Factors:

1 g = 0.0022 lb

Controlled Source Emissions

Pollutant	Emission Factor		Emission Rate	
	g/hp-hr [1]	lb/MMBtu [2]	lb/hr	tpy
NOx	0.91	-	3.94	17.27
CO	1.87	-	8.14	35.64
VOC	0.46	-	2.00	8.77
TSP/PM10/PM2.5	0.03	-	0.14	0.63
SO2	2.00E-03	-	8.70E-03	0.04
CO2	-	110.00	1,744.69	2,547.25
CH4	-	1.36E-03	0.02	0.03
N2O	-	2.73E-04	4.33E-03	6.32E-03
Formaldehyde	-	0.05	0.84	1.22
Acetaldehyde	-	8.36E-03	0.13	0.19
Acrolein	-	5.14E-03	0.08	0.12
Benzene	-	4.40E-04	6.98E-03	0.01
Ethylbenzene	-	3.97E-05	6.30E-04	9.19E-04
n-Hexane	-	1.10E-03	0.02	0.03
Toluene	-	4.08E-04	6.47E-03	9.45E-03
Xylene	-	1.84E-04	2.92E-03	4.26E-03
Total HAPs	-	-	1.09	1.59
Highest Single HAP (Formaldehyde)	-	-	0.84	1.22

Notes:

[1] Emission Factors NOx, CO, VOC, TSP/PM10/PM2.5, and SO2 are from the manufacturer (Attachment 2-5).

[2] Various HAP emission rates were calculated using AP-42 emission rates from Table 3.2-2 (Attachment 2-7). GHG emission factors are from 40 CFR 98 Subpart C Table C-2 (Attachment 2-18).

GEN-CAP Emissions

Annual Emission Cap for Four (4) Temporary Generators (GEN-2 through GEN-5

Source Information

Parameter	Value	Units
Emission Unit ID:	GEN-CAP	
Engine Manufacturer:	Caterpillar	
Engine Model:	G3516C	
Engine Type:	4SLB	
Fuel Type:	Field Gas	
Hours of Operation (Normalized to 100% Load):	5,400.00	hr/yr
Factory HP Rating:	1978	HP
Allowable HP Rating:	1978	HP
Engine BSFC:	7308	Btu/(HP*hr)
Fuel LHV:	1119.168	Btu/scf
Fuel Sulfur Content:	0.005	grains/dscf
Hourly Fuel Flow Rate:	0.014172	MMScf/hr
Annual Fuel Flow Rate:	41.38224	MMScf/yr
Maximum Engine RPM:	1800	RPM
Exhaust Temperature:	918	F
Exhaust Velocity:	110	ft/sec
Exhaust Flow:	11673	acfm
Stack Diameter:	1.5	ft
Stack Height:	30	ft

Uncontrolled Source Emissions

Pollutant	Emission Factor		Emission Rate	
	g/hp-hr[1]	lb/MMBtu[2]	lb/hr	tpy
NOx	0.91	-	3.94	10.64
CO	1.87	-	8.14	21.97
VOC	0.46	-	2.00	5.40
TSP/PM10/PM2.5	0.03	-	0.14	0.39
SO2	2.00E-03	-	8.70E-03	0.02
CO2	-	110.00	1,744.69	4,710.67
CH4	-	1.36E-03	0.02	0.06
N2O	-	2.73E-04	4.33E-03	0.01
Formaldehyde	-	0.05	0.84	2.26
Acetaldehyde	-	8.36E-03	0.13	0.36
Acrolein	-	5.14E-03	0.08	0.22
Benzene	-	4.40E-04	6.98E-03	0.02
Ethylbenzene	-	3.97E-05	6.30E-04	1.70E-03
n-Hexane	-	1.10E-03	0.02	0.05
Toluene	-	4.08E-04	6.47E-03	0.02
Xylene	-	1.84E-04	2.92E-03	7.88E-03
Total HAPs	-	-	1.09	2.93
Highest Single HAP (Formaldehyde)	-	-	0.84	2.26

Notes:

[1] Emission Factors NOx, CO, VOC, TSP/PM10/PM2.5, and SO2 are from the manufacturer (Attachment 2-5).

[2] Various HAP emission rates were calculated using AP-42 emission rates from Table 3.2-2 (Attachment 2-7). GHG emission factors are from 40 CFR 98 Subpart C Table C-2 (Attachment 2-18).

Converstion Factors:

1 g = 0.0022 lb

Uncontrolled Source Emissions

Pollutant	Emission Factor		Emission Rate	
	g/hp-hr[1]	lb/MMBtu[2]	lb/hr	tpy
NOx	0.91	-	3.94	10.64
CO	1.87	-	8.14	21.97
VOC	0.46	-	2.00	5.40
TSP/PM10/PM2.5	0.03	-	0.14	0.39
SO2	2.00E-03	-	8.70E-03	0.02
CO2	-	110.00	1,744.69	4,710.67
CH4	-	1.36E-03	0.02	0.06
N2O	-	2.73E-04	9.97E-03	0.03
Formaldehyde	-	0.05	0.84	2.26
Acetaldehyde	-	8.36E-03	0.13	0.36
Acrolein	-	5.14E-03	0.08	0.22
Benzene	-	4.40E-04	6.98E-03	0.02
Ethylbenzene	-	3.97E-05	6.30E-04	1.70E-03
n-Hexane	-	1.10E-03	0.02	0.05
Toluene	-	4.08E-04	6.47E-03	0.02
Xylene	-	1.84E-04	2.92E-03	7.88E-03
Total HAPs	-	-	1.09	2.93
Highest Single HAP (Formaldehyde)	-	-	0.84	2.26

Notes:

[1] Emission Factors NOx, CO, VOC, TSP/PM10/PM2.5, and SO2 are from the manufacturer (Attachment 2-5).

[2] Various HAP emission rates were calculated using AP-42 emission rates from Table 3.2-2 (Attachment 2-7). GHG emission factors are from 40 CFR 98 Subpart C Table C-2 (Attachment 2-18).

DHY-1 Emissions

Process Simulator was used with a inlet gas throughput of 44 MMscfd
GRI-GLYCalc
See attached documents (Attachment 2-13)

DHY-1 Control Efficiency (GR-1): 98%

Summary of Glycalc Results (Uncontrolled)

VOC		HAP		H2S	
lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
12.92	56.60	8.60	37.66	0.00	0.00

Summary of Glycalc Results (Controlled)

VOC		HAP		H2S	
lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
0.26	1.13	0.17	0.75	0.00	0.00

Glycol Reboiler (GR-1) Emissions
Reboilers for Glycol Dehydration Units & Other Units (Only for units rated < 100 MMBtu/hr)

Source Information

Parameter	Value	Units
Sulfur Content of Gas or use default value[1]	6,000	grains/10^6 scf
Low Heat Value of Gas or use default value	966	Btu/scf
Heat Input	0.75	MMBtu/hr

[1] Sulfur Content of Gas based on inlet gas analysis

Source Emissions

Pollutant	Emission Factor lb/10^6 scf	Emission Rate lb/hr	Emission Rate tpy
NOx	100	0.07	0.32
CO	84	0.06	0.27
VOC	5.5	4.04E-03	0.02
SO2	0.6	4.41E-04	1.93E-03
PM	7.6	0.01	0.02
CO2	120000	88.24	386.47
CH4	2.3	1.69E-03	0.01
N2O	2.2	1.62E-03	0.01
2-Methylnaphthalene	2.40E-05	1.76E-08	7.73E-08
3-Methylcholanthrene	1.80E-06	1.32E-09	5.80E-09
7,12-Dimethylbenz(a)anthracene	1.60E-05	1.18E-08	5.15E-08
Acenaphthene	1.80E-06	1.32E-09	5.80E-09
Acenaphthylene	1.80E-06	1.32E-09	5.80E-09
Anthracene	2.40E-06	1.76E-09	7.73E-09
Benz(a)anthracene	1.80E-06	1.32E-09	5.80E-09
Benzene	2.10E-03	1.54E-06	6.76E-06
Benzo(a)pyrene	1.20E-06	8.82E-10	3.86E-09
Benzo(b)fluoranthene	1.80E-06	1.32E-09	5.80E-09
Benzo(g,h,i)perylene	1.20E-06	8.82E-10	3.86E-09
Benzo(k)fluoranthene	1.80E-06	1.32E-09	5.80E-09
Chrysene	1.80E-06	1.32E-09	5.80E-09
Dibenzo(a,h)anthracene	1.20E-06	8.82E-10	3.86E-09
Dichlorobenzene	1.20E-03	8.82E-07	3.86E-06
Fluoranthene	3.00E-06	2.21E-09	9.66E-09
Fluorene	2.80E-06	2.06E-09	9.02E-09
Formaldehyde	7.50E-02	5.51E-05	2.42E-04
Indeno(1,2,3-cd)pyrene	1.80E-06	1.32E-09	5.80E-09
Naphthalene	6.10E-04	4.49E-07	1.96E-06
Phenanathrene	1.70E-05	1.25E-08	5.48E-08
Pyrene	5.00E-06	3.68E-09	1.61E-08
Toluene	3.40E-03	2.50E-06	1.10E-05
Highest Single HAP (Formaldehyde)	7.50E-02	5.51E-05	2.42E-04
Total HAPs	8.24E-02	6.06E-05	2.65E-04

Emission Factors (AP42 Tables 1.4-1 - Small Boilers, 1.4-2, and 1.4-3) (Attachment 2-8)

Wet Fuel Gas Analysis

Component	Mol %	BTU/scf	# of H atoms
H2S	1.06E-03	672	2
N2	0.43	0	0
CO2	10.82	0	0
Methane	76.26	1011	4
C2	4.77	1783	6
C3	2.07	2572	8
IC4	1.13	3225	10
NC4	1.15	3225	10
IC5	0.79	3981	12
NC5	0.39	3981	12
Cyclopentane	0.05	3290	10
C6	0.54	4667	14
Cyclohexane	0.11	-	-
C7	0.20	-	-
Methylcyclohexane	0.11	-	-
224 TMP	0.01	-	-
Benzene	0.08	-	-
Toluene	0.06	-	-
Ebenzene	2.34E-03	-	-
mXylene	0.04	-	-
C8	0.10	-	-
C9	0.06	-	-
C10	0.11	-	-
H2O	0.70	-	-
MDEA	1.31E-04	-	-
TEG	8.72E-05	-	-
Total:	100	**1057.236**	

Latent Heat of Vaporization of Water:	17476.26	btu/lbmol
Moles of H:	3.954276	lbmol
Moles of H2O Formed:	1.977138	lbmol
Heat Retained in Water:	91.0967	BTU/scf
Net Heating Value:	**966.1391**	BTU/scf

https://www.engineeringtoolbox.com/heating-values-fuel-gases-d_823.html

AM-1 Emissions

Process Simulator was used
ProMax
See attached documents (Attachment 2-14)

AM-1 Control Efficiency (AR-1): 98%

Summary of ProMax Results (Uncontrolled)

VOC		HAP		Benzene		H2S	
lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
91.82	402.19	84.67	370.86	33.28	145.75	--	--

Summary of ProMax Results (Controlled)

VOC		HAP		Benzene		H2S	
lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
1.84	8.04	1.69	7.42	0.67	2.92	--	--

Note: ProMax run was at 35 MMscfd. Emissions here are prorated to 44 MMscfd.

Amine Reboiler (AR-1) Emissions
Reboilers for Amine Units (Only for units rated < 100 MMBtu/hr)

Source Information

Parameter	Value	Units
Sulfur Content of Gas or use default value[1]	6,000	grains/10^6 scf
Low Heat Value of Gas or use default value	966	Btu/scf
Heat Input	36	MMBtu/hr

[1] Sulfur Content of Gas used, as it is greater than the default value

Source Emissions

Pollutant	Emission Factor	Emission Rate	
	lb/10^6 scf	lb/hr	tpy
NOx	100	3.53	15.46
CO	84	2.96	12.99
VOC	5.5	0.19	0.85
SO2	0.6	0.02	0.09
PM	7.6	0.27	1.17
CO2	120000	4,235.29	18,550.59
CH4	2.3	0.08	0.36
N2O	2.2	0.08	0.34
2-Methylnaphthalene	0.000024	0.00	0.00
3-Methylcholanthrene	1.80E-06	6.35E-08	2.78E-07
7,12-Dimethylbenz(a)anthracene	1.60E-05	5.65E-07	2.47E-06
Acenaphthene	1.80E-06	6.35E-08	2.78E-07
Acenaphthylene	1.80E-06	6.35E-08	2.78E-07
Anthracene	2.40E-06	8.47E-08	3.71E-07
Benz(a)anthracene	1.80E-06	6.35E-08	2.78E-07
Benzene	2.10E-03	7.41E-05	3.25E-04
Benzo(a)pyrene	1.20E-06	4.24E-08	1.86E-07
Benzo(b)fluoranthene	1.80E-06	6.35E-08	2.78E-07
Benzo(g,h,i)perylene	1.20E-06	4.24E-08	1.86E-07
Benzo(k)fluoranthene	1.80E-06	6.35E-08	2.78E-07
Chrysene	1.80E-06	6.35E-08	2.78E-07
Dibenzo(a,h)anthracene	1.20E-06	4.24E-08	1.86E-07
Dichlorobenzene	1.20E-03	4.24E-05	1.86E-04
Fluoranthene	3.00E-06	1.06E-07	4.64E-07
Fluorene	2.80E-06	9.88E-08	4.33E-07
Formaldehyde	7.50E-02	2.65E-03	1.16E-02
Indeno(1,2,3-cd)pyrene	1.80E-06	6.35E-08	2.78E-07
Naphthalene	6.10E-04	2.15E-05	9.43E-05
Phenanathrene	1.70E-05	6.00E-07	2.63E-06
Pyrene	5.00E-06	1.76E-07	7.73E-07
Toluene	3.40E-03	1.20E-04	5.26E-04
Highest Single HAP (Formaldehyde)	7.50E-02	2.65E-03	1.16E-02
Total HAPs	8.24E-02	2.91E-03	1.27E-02

Emission Factors (AP42 Tables 1.4-1 - Small Boilers, 1.4-2, and 1.4-3) (Attachment 2-8)

See GR-1 for Wet Fuel Gas Analysis

Tank 800 and 801 Emissions

Tank ID	Volume (bbls)	Tank Type	Diameter (ft)	Height (ft)	Shell Color	Roof Color	Annual Throughput	Product	VOC Emissions (TPY)*		VOC Emissions (lb/hr)*		H2S Emissions (TPY)*		H2S Emissions (lb/hr)*	
									Pre-Control	Post-Control	Pre-Control	Post-Control	Pre-Control	Post-Control	Pre-Control	Post-Control
800	500	VFRT	15.5	15	Tan (Aluminum Specular - Good Condition)	Tan (Aluminum Specular - Good Condition)	720,500.00	Gasoline RVP 12	7.02	0.14	1.60	0.03	0.35	7.02E-03	0.08	1.60E-03
801	500	VFRT	15.5	15	Tan (Aluminum Specular - Good Condition)	Tan (Aluminum Specular - Good Condition)	720,500.00	Gasoline RVP 12	7.02	0.14	1.60	0.03	0.35	7.02E-03	0.08	1.60E-03

Flare Control Efficiency: 98%
H2S Content: 0.05
Note: Calculated using EPA Tanks 4.0.9d (See Attachment 2-15)

F-7005 Routine Emissions

Source Information

Parameter	Value	Units
Hourly Gas Stream to Flare (including pilot):	0.22	Mscf/hr
Annual Gas Stream to Flare:	1.89	MMscf/yr
Max Heat Value of Gas:	966.00	Btu/scf
Field Gas Sulfur Content:	0.60	grains/100 scf
Max Heat Value Pilot Gas:	1,020.00	Btu/scf
Gas MW:	33.64	lb/lbmole
Gas Pressure:	14.70	psia
Gas Temperature:	70.00	F
Flare Control Efficiency:	0.98	
Total VOC wt. % to Flare:	0.58	
Hourly Gas Routed to Flare:	0.36	MMBtu/hr
Annual Gas Routed to Flare:	3,156.40	MMBtu/yr

Source Emissions

	Emission Factor	Emission Rates	
Pollutant	lb/MMBtu	lb/hr	tpy
NOx	0.14	0.05	0.22
CO	0.37	0.13	0.58
CO2	117.00	42.16	184.65
CH4	2.25E-03	8.11E-04	3.55E-03
N2O	2.16E-03	7.77E-04	3.40E-03
VOC	*	0.22	0.95
SO2	*	3.62E-04	1.59E-03
H2S	*	3.69E-06	1.62E-05

*Calculated using Source Information and Mass Balance NOx emissions factor from TCEQ (Attachment 2-9), CO emissions factor from AP-42 Chapter 13.5 (Attachment 2-10), CO2 and GHG emissions factors from AP-42 Chapter 1.4 (Attachment 2-8).

See GR-1 for Wet Fuel Gas Analysis

F-7005 SSM Emissions

Source Information

Parameter	Value	Units
Hourly Gas Stream to Flare (including pilot):	125.00	Mscf/hr
Annual Gas Stream to Flare:	30.00	MMscf/yr
Max Heat Value of Gas:	966.00	Btu/scf
Inlet Gas Sulfur Content:	2%	Average[1]
Pilot Gas to Flare:	0.00	Mscf/hr
Max Heat Value Pilot Gas:	1,020.00	Btu/scf
Pilot Gas Sulfur Content:	0.25	grains/100 scf
Gas MW:	33.64	lb/lbmole
Gas Pressure:	14.70	psia
Gas Temperature:	70.00	F
Flare Control Efficiency:	0.98	
Total VOC wt. % to Flare:	0.58	
Hourly Gas Routed to Flare:	120.75	MMBtu/hr
Annual Gas Routed to Flare:	28,980.00	MMBtu/yr
Pilot Gas Routed to Flare:	0.00	MMBtu/hr

Notes:

[1] Inlet gas H2S content will be between 1.3% and 2% on average.

Conversions and Constants:		
Ideal Gas Conversion Factor	379	scf/lb-mol
H2S MW	34.1	lb/lb-mol
SO2 MW	64.066	lb/lb-mol
	7000	gr/lb

Controlled Source Emissions

	Emission Factor	Emission Rates	
Pollutant	lb/MMBtu	lb/hr	tpy
NOx	0.14	16.66	2.00
CO	0.37	44.68	5.36
CO2	117.00	14,127.75	1,695.33
CH4	2.25E-03	0.27	0.03
N2O	2.16E-03	0.26	0.03
VOC	*	125.63	15.08
SO2	*	414.15	49.70
H2S	*	4.50	0.54

*Calculated using Source Information and Mass Balance
NOx emissions factor from TCEQ (Attachment 2-9), CO emissions factor from AP-42 Chapter 13.5 (Attachment 2-10), CO2 and GHG emissions factors from AP-42 Chapter 1.4 (Attachment 2-8).

See GR-1 for Wet Fuel Gas Analysis

F-400 Emissions

Source Information

Parameter	Value	Units
Hourly Gas Stream to Flare (including pilot):	0.05	Mscf/hr
Annual Gas Stream to Flare:	0.41	MMscf/yr
Max Heat Value of Gas:	2,099.70	Btu/scf
Field Gas Sulfur Content:	5.00	grains/100 scf
Max Heat Value Pilot Gas:	1,020.00	Btu/scf
Gas MW:	42.27	lb/lbmole
Gas Pressure:	14.70	psia
Field Gas H2S wt. % to Flare	0.01	%
Gas Temperature:	70.00	F
Flare Control Efficiency:	0.98	
Total VOC wt. % to Flare:	0.72	
Hourly Gas Routed to Flare:	0.10	MMBtu/hr
Annual Gas Routed to Flare:	851.22	MMBtu/yr

Controlled Source Emissions

Pollutant	Emission Factor	Emission Rates	
	lb/MMBtu	lb/hr	tpy
NOx	0.14	0.01	0.06
CO	0.37	0.04	0.16
CO2	117.00	11.37	49.80
CH4	2.25E-03	2.19E-04	9.58E-04
N2O	2.16E-03	2.10E-04	9.18E-04
VOC	*	0.07	0.32
SO2	*	6.48E-04	2.84E-03
H2S	*	1.22E-03	5.33E-03

*Calculated using Source Information and Mass Balance
NOx emissions factor from TCEQ (Attachment 2-9), CO emissions factor from AP-42 Chapter 13.5 (Attachment 2-10), CO2 and GHG emissions factors from AP-42 Chapter 1.4 (Attachment 2-8).

FUG-1 Emissions

VOC Content[1]: 10%
H2S Content[2]: 1.28%

Permitted Fugitives (FUG-1)

Equipment Type	Service	No. Of Sources	Emission Factor [3] kg/hr/source	VOC lb/hr	VOC tpy
Valves	Gas	242	4.50E-03	0.24	1.05
	Heavy Oil	0	8.40E-06	--	--
	Light Oil	0	2.50E-03	--	--
	Water/Oil	6	9.80E-05	1.29E-04	5.67E-04
Pump Seals	Gas	0	2.40E-03	--	--
	Heavy Oil	0	NA	--	--
	Light Oil	0	1.30E-02	--	--
	Water/Oil	0	2.40E-05	--	--
Connectors	Gas	495	2.00E-04	0.02	0.10
	Heavy Oil	0	7.50E-06	--	--
	Light Oil	0	2.10E-04	--	--
	Water/Oil	10	1.10E-04	2.42E-04	1.06E-03
Flanges	Gas	200	3.90E-04	0.02	0.08
	Heavy Oil	0	3.90E-07	--	--
	Light Oil	0	1.10E-04	--	--
	Water/Oil	12	2.90E-06	7.66E-06	3.35E-05
Open Ends	Gas	17	2.00E-03	7.48E-03	0.03
	Heavy Oil	0	1.40E-04	--	--
	Light Oil	0	1.40E-03	--	--
	Water/Oil	0	2.50E-04	--	--
Other	Gas	15	8.80E-03	0.03	0.13
	Heavy Oil	0	3.20E-05	--	--
	Light Oil	0	7.50E-03	--	--
	Water/Oil	0	1.40E-02	--	--
			Total VOC	**0.32**	**1.38**
			Total H2S	**4.04E-03**	**0.02**

Project Fugitives (FUG-2)

Equipment Type	Service	No. Of Sources	Emission Factor [3] kg/hr/source	VOC lb/hr	VOC tpy
Valves	Gas	46	4.50E-03	0.05	0.20
	Heavy Oil	0	8.40E-06	--	--
	Light Oil	38	2.50E-03	0.02	0.09
	Water/Oil	0	9.80E-05	--	--
Pump Seals	Gas	0	2.40E-03	--	--
	Heavy Oil	0	NA	--	--
	Light Oil	10	1.30E-02	0.03	0.13
	Water/Oil	0	2.40E-05	--	--
Connectors	Gas	0	2.00E-04	--	--
	Heavy Oil	0	7.50E-06	--	--
	Light Oil	0	2.10E-04	--	--
	Water/Oil	0	1.10E-04	--	--
Flanges	Gas	402	3.90E-04	0.03	0.15
	Heavy Oil	0	3.90E-07	--	--
	Light Oil	40	1.10E-04	9.68E-04	4.24E-03
	Water/Oil	0	2.90E-06	--	--
Open Ends	Gas	27	2.00E-03	0.01	0.05
	Heavy Oil	0	1.40E-04	--	--
	Light Oil	4	1.40E-03	1.23E-03	5.40E-03
	Water/Oil	0	2.50E-04	--	--
Other	Gas	17	8.80E-03	0.03	0.14
	Heavy Oil	0	3.20E-05	--	--
	Light Oil	14	7.50E-03	0.02	0.10
	Water/Oil	0	1.40E-02	--	--
			Total VOC	**0.20**	**0.87**
			Total H2S	**2.55E-03**	**0.01**

Notes:
[1] VOC content is based on the site inlet gas concentration having a VOC content of less than 10% (Attachment 2-16).
[2] H2S content is based on the site inlet gas concentration having an average H2S content of 1.28% (Attachment 2-16).
[3] Emission Factors are from EPA Protocol for Equipment Leak Emission Estimates Table 2-4 (Attachment 2-11)

Converstion Factors
1 g = 0.0022 lb

OILLOAD-1 Emissions

Uncontrolled Oil Loading

Parameter	Value	Units	Comments
Facility Oil Throughput	1,441,020.00	gal/yr	
Facility Oil Throughput	8,820.00	gal/hr	
S - Saturation Factor	0.60	-	From AP-42 Table 5.2-1
M - Molecular Weight of Vapors	46.61	lb/lb-mol	
P_{annual} - Avg. Annual True Vapor Pressure of Liquid Loaded	5.84	psia	
P_{hourly} - Max Hourly True Vapor Pressure of Liquid Loaded	6.52	psia	
T_{annual} - Average Annual Temperature of Bulk Liquid Loaded	523.29	R	
T_{hourly} - Max Hourly Temperature of Bulk Liquid Loaded	537.22	R	
Control Efficiency	0%		
L_L - Loading Loss	4.23	lbs/10^3gal	Hourly
L_L - Loading Loss	3.89	lbs/10^3gal	Annual
VOC Emissions	**37.30**	**lbs/hr**	
VOC Emissions	**2.80**	**tpy**	

Controlled Oil Loading

Parameter	Value	Units	Comments
Facility Oil Throughput	1,441,020.00	gal/yr	
Facility Oil Throughput	8,820.00	gal/hr	
S - Saturation Factor	0.60	-	From AP-42 Table 5.2-1
M - Molecular Weight of Vapors	46.61	lb/lb-mol	
P_{annual} - Avg. Annual True Vapor Pressure of Liquid Loaded	5.84	psia	
P_{hourly} - Max Hourly True Vapor Pressure of Liquid Loaded	6.52	psia	
T_{annual} - Average Annual Temperature of Bulk Liquid Loaded	523.29	R	
T_{hourly} - Max Hourly Temperature of Bulk Liquid Loaded	537.22	R	
Control Efficiency	0%		
L_L - Loading Loss	4.23	lbs/10^3gal	Hourly
L_L - Loading Loss	3.89	lbs/10^3gal	Annual
VOC Emissions	**37.30**	**lbs/hr**	
VOC Emissions	**2.80**	**tpy**	

AP-42 5.2-4 Equation 1 (Attachment 2-12):

$$L_L = 12.46 * SPM / T$$

Thermal Oxidizer (TO)

Total TO Emissions

NOx		CO		SO2		CO2		H2S		PM	
lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
4.00	2.42	2.32	1.40	5,814.78	8.93	16,345.12	2,075.92	3.10	4.76E-03	0.22	0.13

Total TO Emissions with SSM

NOx		CO		SO2		CO2		H2S		PM	
lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
2.90	2.42	1.68	1.40	5,814.78	8.92	16,345.12	2,075.48	3.10	4.75E-03	0.16	0.13

Total TO Emissions with Upsets and SSM

NOx		CO		SO2		CO2		H2S		PM	
lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
4.00	2.42	2.32	1.40	5,814.78	8.93	16,345.12	2,075.92	3.10	4.76E-03	0.22	0.13

Total TO Emissions Without Maintenance or Upsets

NOx		CO		SO2		CO2		H2S		PM	
lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
1.10	2.42	0.64	1.40	116.28	0.20	1,213.73	2,051.66	0.06	1.04E-04	0.06	0.13

The tables above summarize the emissions from each possible operating scenario. Total TO emission rates are the max of any scenario, and represent the maximum emission rates for the TO
Total TO Emissions with SSM represent routine operations, with the addition of SSM emissions and compressor swap emissions.
Total TO Emissions with Upsets and SSM represent routine operations, with the addition of minor upset emissions, SSM emissions and compressor swap emissions.
Total TO Emissions without Maintenance or Upsets represent routine operations and compressor swap emissions.

Manufacturer Emission Factors (Attachment 2-6)

NOx	0.138	lb/MMBtu
CO	0.08	lb/MMBtu
CO2 (AP-42 Chapter 1.4) (Attachment 2-8)	117	lb/MMBtu
PM (AP-42 Chapter 1.4) (Attachment 2-8)	7.45E-03	lb/MMBtu
CH4 (AP-42 Chapter 1.4) (Attachment 2-8)	2.25E-03	lb/MMBtu
N2O (AP-42 Chapter 1.4) (Attachment 2-8)	2.16E-03	lb/MMBtu

SSM Use

Operating Hours	3	hr/yr
H2S Content	20.66%	mol%[1]
CO2 Content	71.76%	mol%[1]
H2S to SO2 Conversion Rate	99.9%	
Heat Capacity (for waste gas)	21.00	MMBtu/hr
Process Flow	4.00	MMscfd
Process Flow	166,666.67	scf/hr
Process Flow	439.75	lb-mol/hr
Process Flow	90.85	lb-mol H2S/hr
Process Flow	3,098.09	lbH2S/hr
Process Flow	315.57	lb-mol CO2/hr
Process Flow	13,888.12	lbCO2/hr
TO SO2 Emissions	**5,814.78**	**lb/hr**
TO H2S Emissions	**3.10**	**lb/hr**
TO SO2 Emissions	**6.72**	**ton/yr**
TO H2S Emissions	**4.65E-03**	**ton/yr**
TO NOx Emissions	**2.90**	**lb/hr**
TO CO Emissions	**1.68**	**lb/hr**
TO CO2 Emissions	**16,345.12**	**lb/hr**
TO PM Emissions	**0.16**	**lb/hr**
TO CH4 Emissions	**0.05**	**lb/hr**
TO N2O Emissions	**0.05**	**lb/hr**
TO NOx Emissions	**4.35E-03**	**ton/yr**
TO CO Emissions	**2.52E-03**	**ton/yr**
TO CO2 Emissions	**24.52**	**ton/yr**
TO PM Emissions	**2.35E-04**	**ton/yr**
TO CH4 Emissions	**7.09E-05**	**ton/yr**
TO N2O Emissions	**6.79E-05**	**ton/yr**

Notes:
[1] Based on a facility inlet H2S concentration of 1.3% - 2% and CO2 concentration of 1.9% - 4.2%

Conversions and Constants:

Ideal Gas Conversion Factor	379	scf/lb-mol
H2S MW	34.1	lb/lb-mol
CO2 MW	44.01	lb/lb-mol
SO2 MW	64.07	lb/lb-mol
	7000	gr/lb

Compressor Swap

Operating Hours	0.25	hr/yr
Number of Events per Year	12	
H2S Content	20.66%	mol%[1]
CO2 Content	71.76%	mol%[1]
H2S to SO2 Conversion Rate	99.9%	
Hourly Gas Routed to TO	8.00	MMBtu/hr
Process Flow	3,333.00	scf/event
Process Flow	3,333.00	scf/hr
Process Flow	8.79	lb-mol/hr
Process Flow	1.82	lb-mol H2S/hr
Process Flow	61.96	lbH2S/hr
Process Flow	6.31	lb-mol CO2/hr
Process Flow	277.73	lbCO2/hr
TO SO2 Emissions	**116.28**	**lb/hr**
TO H2S Emissions	**0.06**	**lb/hr**
TO SO2 Emissions	**0.17**	**ton/yr**
TO H2S Emissions	**9.29E-05**	**ton/yr**
TO NOx Emissions	**1.10**	**lb/hr**
TO CO Emissions	**0.64**	**lb/hr**
TO CO2 Emissions	**1,213.73**	**lb/hr**
TO PM Emissions	**0.06**	**lb/hr**
TO CH4 Emissions	**0.02**	**lb/hr**
TO N2O Emissions	**0.02**	**lb/hr**
TO NOx Emissions	**1.66E-03**	**ton/yr**
TO CO Emissions	**9.60E-04**	**ton/yr**
TO CO2 Emissions	**1.82**	**ton/yr**
TO PM Emissions	**8.94E-05**	**ton/yr**
TO CH4 Emissions	**2.70E-05**	**ton/yr**
TO N2O Emissions	**2.59E-05**	**ton/yr**

Idle (Pilot Gas and Sweep Gas) with Maintenance

Operating Hours	8,757	hr/yr
Total Flow (Pilot Gas and Sweep Gas)	3,574.08	scf/hr
Hourly Gas Routed to TO	4.00	MMBtu/hr
Heat Value of Gas	1,119.17	Btu/scf
Fuel Gas Sulfur Content	0.50	gr/100scf
Sulfur Flow Rate	17.87	gr/hr
Sulfur Flow Rate	0.00	lb/hr
MW of S (Assuming it to be H2S)	34.10	lb/lb-mol
H2S to SO2 Conversion Rate	99.9%	
TO SO2 Emissions	**4.79E-03**	**lb/hr**
TO H2S Emissions	**2.55E-06**	**lb/hr**
TO SO2 Emissions	**0.02**	**ton/yr**
TO H2S Emissions	**1.12E-05**	**ton/yr**
TO NOx Emissions	**0.55**	**lb/hr**
TO CO Emissions	**0.32**	**lb/hr**
TO CO2 Emissions	**468.00**	**lb/hr**
TO PM Emissions	**0.03**	**lb/hr**
TO CH4 Emissions	**9.00E-03**	**lb/hr**
TO N2O Emissions	**8.62E-03**	**lb/hr**
TO NOx Emissions	**2.42**	**ton/yr**
TO CO Emissions	**1.40**	**ton/yr**
TO CO2 Emissions	**2,049.14**	**ton/yr**
TO PM Emissions	**0.13**	**ton/yr**
TO CH4 Emissions	**0.04**	**ton/yr**
TO N2O Emissions	**0.04**	**ton/yr**

Idle (Pilot Gas and Sweep Gas) - No Maintenance

Operating Hours	8,760.00	hr/yr
Total Flow (Pilot Gas and Sweep Gas)	3,574.08	scf/hr
Hourly Gas Routed to TO	4.00	MMBtu/hr
Heat Value of Gas	1,119.17	Btu/scf
Fuel Gas Sulfur Content	0.50	gr/100scf
Sulfur Flow Rate	17.87	gr/hr
Sulfur Flow Rate	0.00	lb/hr
MW of S (Assuming it to be H2S)	34.10	lb/lb-mol
H2S to SO2 Conversion Rate	99.9%	
TO SO2 Emissions	**4.79E-03**	**lb/hr**
TO H2S Emissions	**2.55E-06**	**lb/hr**
TO SO2 Emissions	**0.02**	**ton/yr**
TO H2S Emissions	**1.12E-05**	**ton/yr**
TO NOx Emissions	**0.55**	**lb/hr**
TO CO Emissions	**0.32**	**lb/hr**
TO CO2 Emissions	**468.00**	**lb/hr**
TO PM Emissions	**0.03**	**lb/hr**
TO CH4 Emissions	**9.00E-03**	**lb/hr**
TO N2O Emissions	**8.62E-03**	**lb/hr**
TO NOx Emissions	**2.42**	**ton/yr**
TO CO Emissions	**1.40**	**ton/yr**
TO CO2 Emissions	**2,049.84**	**ton/yr**
TO PM Emissions	**0.13**	**ton/yr**
TO CH4 Emissions	**0.04**	**ton/yr**
TO N2O Emissions	**0.04**	**ton/yr**

Minor Upsets (Includes Pilot/Sweep Gas)

Operating Hours	0.02	hr/yr
Number of Events per Year	12	
H2S Content	20.66%	mol%[1]
CO2 Content	71.76%	mol%[1]
H2S to SO2 Conversion Rate	99.9%	
Heat Capacity (for waste gas and pilot/sweep gas)	29.00	MMBtu/hr
Process Flow	4.00	MMscfd
Process Flow	166,666.67	scf/hr
Process Flow	3,333.33	scf/event
Process Flow	8.80	lb-mol/hr
Process Flow	1.82	lb-mol H2S/hr
Process Flow	61.96	lbH2S/hr
Process Flow	6.31	lb-mol CO2/hr
Process Flow	277.76	lbCO2/hr
TO SO2 Emissions	**116.30**	**lb/hr**
TO H2S Emissions	**0.06**	**lb/hr**
TO SO2 Emissions	**0.01**	**ton/yr**
TO H2S Emissions	**7.44E-06**	**ton/yr**
TO NOx Emissions	**4.00**	**lb/hr**
TO CO Emissions	**2.32**	**lb/hr**
TO CO2 Emissions	**3,670.76**	**lb/hr**
TO PM Emissions	**0.22**	**lb/hr**
TO CH4 Emissions	**0.07**	**lb/hr**
TO N2O Emissions	**0.06**	**lb/hr**
TO NOx Emissions	**4.80E-04**	**ton/yr**
TO CO Emissions	**2.78E-04**	**ton/yr**
TO CO2 Emissions	**0.44**	**ton/yr**
TO PM Emissions	**2.59E-05**	**ton/yr**
TO CH4 Emissions	**7.83E-06**	**ton/yr**
TO N2O Emissions	**7.50E-06**	**ton/yr**

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)

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.

This section contains the following references or actual documentation to support the emission in the required forms and the calculations in Section 6.

Subsection 1 – Documentation used to support calculations of units added or modified in this application.

- Current version of AP-42 located online at: EPA AP-42 Compilation Air Emissions Factors
- Specific sections used in this application:
  - Section 3.2 – Natural Gas-fired Reciprocating Engines (Table 3.2-2)
- Compressor manufacturer and catalyst specification sheet (ENG-2)

Subsection 2 – Documentation used to support calculations for all other units not affected by this application.

- Current version of AP-42 located online at: EPA AP-42 Compilation Air Emissions Factors
- Specific sections used in this application:
  - Section 1.4 – Natural Gas Combustion (Tables 1.4-1 – 1.4-3)
  - Section 3.2 – Natural Gas-fired Reciprocating Engines (Table 3.2-2)
  - Section 13.5 Loading Loss Equation (Table 13.5-1)
- Compressor manufacturer and catalyst specification sheet (ENG-3, ENG-5)
- Generator manufacturer specification sheet
- Thermal oxidizer manufacturer specification sheet
- TCEQ Flare Emission Factors
- GRI-GLYCalc Output
- ProMax Output
- Tanks 4.0.9.d Output
- Fuel Gas Analysis
- 40 CFR 98 Subpart C Table C-2

Section 7

Subsection 1 – Information Used to Determine Emissions for Units Added or Modified with this Application

For clarity, this Subsection 1 contains information used to determine emissions for units that were either added or modified with this application. (i.e. Units ENG-2). For information pertinent to all other units that were not affected by this application, please refer to Subsection 2.

USA COMPRESSION

USA Compression Unit 10035 Caterpillar G3516B Emissions

Date of Manufacture	January 31, 2006	Engine Serial Number	4EK04915-REF-JEF	Date Modified/Reconstructed	ULB conv. Mod. 12/16/10
Driver Rated HP	1380	Rated Speed in RPM	1200	Combustion Type & Setting	4-stroke lean burn
Number of Cylinders	16	Compression Ratio	8:1	Combustion Air Treatment	
Total Displacement, in^3	4211	Fuel Delivery Method	GAV w/AFRC		

Compressor Manufacturer	Ariel	Compressor Model	JGT4	Compressor Serial Number	F14200-ELP

Fuel Consumption 7148 *LHV BTU/bhp-hr or* 7898 *HHV BTU/bhp-hr*
Altitude 2800 *ft*
Maximum Air Inlet Temp 100 *F*

	g/bhp-hr [1]	lb/MMBTU [2]	lb/hr	TPY
Nitrogen Oxides (NOx)	0.5		1.52	6.66
Carbon Monoxide (CO)	2.37		7.21	31.58
Volatile Organic Compounds (VOC or NMNEHC excluding CH2O)	0.43		1.31	5.73
Formaldehyde (CH2O)	0.41		1.25	5.46
Particulate Matter (PM) Filterable+Condensable		0.0099871	1.09E-01	4.77E-01
Sulfur Dioxide (SO2)		0.0005880	6.41E-03	2.81E-02

	g/bhp-hr [1]	lb/hr	Metric Tonne/yr
Carbon Dioxide (CO2)	476	1448	5753
Methane (CH4)		0.00	0.00

[1] g/bhp-hr are based on manufacturers performance specifications.
Note that g/bhp-hr values are based on 100% Load Operation. For air permitting, it is recommended to use a 20% safety margin for CO, VOC and other organic compounds to allow for variation in operating parameters and fuel gas quality.
[2] Emission Factor obtained from EPA's AP-42, Fifth Edition, Volume I, Chapter 3: Stationary Internal Combution Sources (Section 3.2 Natural Gas-Fired Reciprocating Engines, Table 3.2-2).

Catalytic Converter Emissions

Catalytic Converter Make amd Model: *ELX-4200Z-1616F-40CEE-246*
Element Type: *oxidation*
Number of Elements in Housing: *3*
Air/Fuel Ratio Control *yes*
Other Emissions Controls: *na*

	% Reduction	g/bhp-hr	**lb/hr**	**TPY**
Nitrogen Oxides (NOx)	0	0.50	**1.52**	**6.66**
Carbon Monoxide (CO)	75	0.59	**1.80**	**7.90**
Volatile Organic Compounds (VOC or NMNEHC excluding CH2O)	0	0.43	**1.31**	**5.73**
Formaldehyde (CH2O)	65	0.14	**0.44**	**1.91**
Particulate Matter (PM)	0	0.00	**1.09E-01**	**4.77E-01**
Sulfur Dioxide (SO2)	0	0.00	**6.41E-03**	**2.81E-02**

	% Reduction	**lb/hr**	**Metric Tonne/yr**
Carbon Dioxide (CO2)	0	**1448**	**5753**
Methane (CH4)	0	**0.00**	**0.00**

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:

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

[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 ≤ 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.

Section 7

Subsection 2 – Information Used to Determine Emissions for All Other Units Since Acquisition

For clarity, this Subsection 2 contains information used to determine emissions for all other units at this facility that were not affected by this application (i.e. all units except for Units ENG-2). For information pertinent to the units added or modified with this application, please refer to Subsection 1.

Equipment Specification

Proposal Information

Proposal Number:	JB-22-002218 Rev(2)	Date:	**7/18/2022**
Project Reference:	Enerflex - EVX Cat 3616		

Engine Information

Engine Make:	Caterpillar	Speed:	Rated
Engine Model:	G3616A4	Power Output:	5,000 bhp
Rated Speed:	1000 RPM	Exhaust Flow Rate:	31,482 acfm (cfm)
Fuel Description:	Natural Gas	Exhaust Temperature:	768 ° F
Hours Of Operation:	8760 Hours per year	O_2:	11.5%
Load:	100%	H_2O:	17%

Emission Data (100% Load)

Emission	Raw Engine Emissions						Target Outlet Emissions						Calculated Reduction
	g/bhp-hr	*tons/yr*	*ppmvd @ 15% O_2*	*ppmvd*	*g/kW-hr*	*lb/MW-hr*	*g/bhp-hr*	*tons/yr*	*ppmvd @ 15% O_2*	*ppmvd*	*g/kW-hr*	*lb/MW-hr*	
NO_x	*0.3*	14.48	26	41	0.402	0.89							
CO	*2.79*	134.7	394	627	3.741	8.25	*0.16*	7.72	23	36	0.215	0.47	94.3%
NMNEHC	*0.3*	14.48	74	118	0.402	0.89	0.1	4.83	25	39	0.134	0.3	66.7%
CH_2O	*0.17*	8.21	22	36	0.228	0.5	*0.06*	2.9	8	13	0.08	0.18	64.7%

System Specifications

Oxidation (SP-RCSIGA-72-TBD)

Design Exhaust Flow Rate:	31,482 acfm (cfm)
Design Exhaust Temperature:	768°F
Housing Model Number:	SP-RCSIGA-72-TBD-HSG
Element Model Number:	MECB-OX-SB4000-2421-3600-291, MEC-BK-XX-2421-4000-291
Number of Catalyst Elements:	3
Number of Spare Catalyst Tracks:	3
Maximum Wind Loading:	100 mph
System Pressure Loss:	8.0 inches of WC (Clean) (19.9 mBar)
Exhaust Temperature Limits*:	550 – 1250°F (catalyst inlet); 1350°F (catalyst outlet) 288 – 677°C (catalyst inlet); 732°C (catalyst outlet)

* General catalyst temperature operating range. Performance is based on the Design Exhaust Temperature.

Application Data Report

Proposal Information

Proposal Number:
Project Reference: Comal Energy - 3616 A4 - SCR
Date: 6/21/2018

Engine Information

Application:	Gas Compression	Engine Operation:	Gas Compression
Number of Engines:	1	Fuel Description:	Natural Gas
Engine Make:	Caterpillar	Type of Lube Oil:	0.6 wt% sulfated ash or less
Engine Model:	G 3616 LE TA	Lube Oil Consumption:	0.1 % Fuel Consumption
Rated Speed:	1000 RPM	Number of Exhaust Manifolds:	1
		Design Back Pressure:	8 In. of WC

Engine Cycle Data

Load	Speed	Power	Exhaust Flow	Exhaust Temp.	Fuel Cons.	O_2	H_2O
%		bhp	acfm (cfm)	F	btu/bhp-hr	%	%
100	Rated	5,000	30,722	841	6,687	11	17

Load	Speed	NO_x	CO	NMHC	NMNEHC	CH_2O
%		g/bhp-hr	g/bhp-hr	g/bhp-hr	g/bhp-hr	g/bhp-hr
100	Rated	0.5	2.28	0.95	0.28	0.2

Emission Data (100% Load)

Emission	Raw Engine Emissions						Target Outlet Emissions						Calculated Reduction
	g/bhp-hr	tons/yr	ppmvd @ 15% O_2	ppmvd	lb/MW-hr	g/kW-hr	g/bhp-hr	tons/yr	ppmvd @ 15% O_2	ppmvd	lb/MW-hr	g/kW-hr	
NO_x*	0.5	24.14	44	74	1.48	0.671	0.05	2.41	4	7	0.15	0.067	90%
CO	2.28	110.08	332	557	6.74	3.058	0.16	7.71	23	39	0.47	0.214	93%
NMNEHC**	0.28	13.52	71	119	0.83	0.375	0.08	3.86	20	34	0.24	0.107	71.4%
CH_2O	0.2	9.66	27	46	0.59	0.268	0.03	1.45	4	7	0.09	0.04	85%

System Specifications

SCR/Oxidation (SP-PTH-90-17040144-XH6B0, 42" Mixing Section (2 Mixer), SP-CBL121-16020059, ACIS II)

Design Exhaust Flow Rate:	30,656 acfm (cfm)
Design Exhaust Temperature:	840°F
Housing Model Number:	SP-PTH-90-17040144-HSG, SP-CBL121-16020059
Element Model Number:	RXS-RE-304-S3624XH, SCRC-044-150-450
Number of Catalyst Elements:	6
Number of Spare Catalyst Tracks:	0
System Pressure Loss:	9.0 inches of WC (Clean)
Sound Attenuation:	42-50 dBA insertion loss
Sound Attenuation:	Extreme Grade (Total System)
Exhaust Temperature Limits:	572 – 977°F
Reactant:	Urea
Percent Concentration:	32.5%
Estimated Reactant Consumption:	1.5 gal/hr (5.6 L/hr) / Per Engine

* MW referenced as NO_2
** MW referenced as CH_4. Assumed as 100% unsaturated HCs. Average at steady state per EPA 40CFR60 Method 25A for HC or mutually agreed test method.

XQ1475G RENTAL

CONTINUOUS 1475 kW

50/60 Hz Switchable

Frequency (Hz)	Voltage (V)	Continuous kW (kVA)
50 Hz	400/230V	1475 (1844)
60 Hz	480/240V	1475 (1844)

FEATURES

FUEL/EMISSIONS STRATEGY

- Meets most worldwide emissions requirements down to 500 mg/Nm^3 NO_x level without after treatment (contact factory for applications requiring 0.5g/hp-hr performance)

SINGLE-SOURCE SUPPLIER

- Generator set manufactured in ISO 9001:2000 compliant facility
- Package factory designed and production tested
- Generator set and components meet or exceed the following specifications:AS1359, AS2789, BS4999, DIN6271,DIN6280, EGSA101P, JEM1359,IEC 34/1, ISO3046/1, ISO8528, NEMA MG1-22

WORLDWIDE PRODUCT SUPPORT

- Cat® dealers provide extensive post sale support including maintenance and repair agreements
- Supported 100% by the Cat dealer with warranty on parts and labor

CAT G3516C ISLAND MODE GAS ENGINE

- Compact, four-stroke-cycle gas engine provides exceptional dependability, fuel economy and power density
- Robust kilowatt based air to fuel ratio control system yields enhanced system performance
- Designed for maximum performance on low pressure pipeline natural gas of 3-7 psi (0.21 kg/cm² - 0.49 kg/cm²) to the container with a methane number range of 55-100 (contact factory for methane numbers <55)
- Island mode feature improves engine's capability to handle electrical loading and unloading

REDUCED ENVIRONMENTAL IMPACT

- 110% spill containment of onboard engine fluids
- Positive crankcase fumes ventilation

LEHX0021-00

COOLING SYSTEM

- Horizontally mounted radiator with vertical discharge
- Sized compatible to rating with energy efficient electric drive fan and core.
- Provides 40C (104F) ambient capability with 500 mg/Nm^3 NOx (1g/hp-hr) at 100% continuous rating before derate
- Variable frequency drive fan controls improve partial load fuel consumption

CAT GENERATOR

- Cat SR4B 826 frame generator designed to match the performance and output characteristics of the Cat gas engine
- Double bearing, wye-connected, static regulated, brushless, permanent magnet excited

ON PACKAGE CONTROL PANEL SYSTEM

- Provides auto paralleling using package mounted controls
- EMCP 4.2 offers engine and generator monitoring and protection
- PL1000E Controller
- Engine Advisor Panel
- AGC-4 provides paralleling, load sharing, VFD control, and primary generator protection
- Intertie protection provided via utility grade Basler BE1-11i utility multi-function relay (UMR)

DIGITAL VOLTAGE REGULATOR (CAT DVR)

- Three-phase sensing with adjustable volts-per-hertz regulation
- Provides precise control and constant voltage in the normal operating range.

SOUND ATTENUATED CONTAINER

- Provides 9-high stack CSC rated enclosure for ease of transportation and protection.
- Meets 72 dB(A) at 15 meters or below per SAE J1074 measurement procedure at continuous rating

XQ1475G RENTAL

FACTORY INSTALLED STANDARD EQUIPMENT

SYSTEM	STANDARD EQUIPMENT
Engine	Cat G3516C Island Mode Gas Engine (Operates on 31.5 to 47.2 MJ/Nm^3 (800 to 1200 btu/ft^3) dry pipeline natural gas) Cat Engine Advisor Panel provides engine diagnostics and full text descriptions Cat Gas Engine Control Module (Cat GECM) includes electronic speed governor with hydrax actuator and provides transient richening and turbo bypass control Electronic Ignition System (controlled by ECM) Individual cylinder Detonation Sensitive Timing (DST) Engine installed electronic fuel metering valve Hydraulic actuated throttle plate electronically controlled by ECM Heavy duty, single element canister type air cleaner with service indicator Charging Alternator, 60-Amp Dual 24V electric starting motors Integral lube oil cooler, lube oil pump, oil filter, filler, and dipstick and oil drain lines routed to engine rail Prelube Pump, 24VDC continuous type Jacket Water Heater, 9kW, 400/480V, 50/60 Hz, 3-phase with isolation valves
Generator	Double bearing SR-4B brushless, form wound, permanent magnet excited, three-phase with Cat digital voltage regulator (Cat DVR), space heater, 6-lead design, Class H insulation operating at Class F temperature for extended life, winding temperature detectors and anti-condensation space heaters (120/240V 1.2 kW). Generator equipped with System 4 insulation protection.
Containerized Module	40' ISO high cube container, 9-high stack CSC certified Four (4) sound attenuated air intake louvers and 3 lockable personnel doors with panic release Interior walls and ceilings insulated with 100 mm of acoustic paneling Floor of container is undercoated for corrosion protection Side bus bar access door, external access load connection bus bars Shore power connection via distribution block connections for jacket water heater, battery charger, generator space heaters, and generator condensate heaters Six (6) DC lights 3" ANSI flange customer fuel connection with cover to prevent vandalism Energized-to-run (ETR) shutoff valve (double solenoid, low/high pressure switch, CSA/FM approved) Cat Brand fuel filter, wall mounted and gas pressure regulator Lube oil level regulator with makeup tank Sound attenuated 72 dB(A) @ 15 m (50 ft) Four (4) oversized maintenance-free batteries, battery rack and 20-Amp battery charger Critical grade exhaust silencer with vertical discharge and single 2 m (6.5 ft.) stack Vibration isolators, stainless steel fastening hardware and hinges External drain access to standard fluids One 4.5 kg (10 lb) carbon dioxide fire extinguisher Standard Cat rental decals and painted standard Cat power module white LH and RH engine service panels integrated into container side walls 110% spill containment system for on-board engine fluids
Cooling	Standard cooling provides 40C (104F) ambient capability with 500mg/Nm^3 NOx at 100% Continuous Horizontally mounted radiator with vertical air discharge Variable frequency drive (VFD) for optimal partial load fuel consumption
Generator Controls and Protection	Controls provide auto paralleling AGC-4 controller, CAN-bus, ethernet comm, PWM and analog outputs, legacy analog load sharing; includes PL1000E gas engine Advisor panel for operational/diagnostic information; cabinet houses shore power transformer, distribution, protection, and internal/external power selector switch EMCP 4.2 genset mounted controller Automatic start/stop with cool down timer Generator Protection features: 25, 32, 40, 46, 47, 50/51, 27/59, 81 O/U Reverse compatibility for interface to legacy power modules 3200A IEC rated generator circuit breaker with LSIG trip unit w/ammeter Multi-mode operation (island, multi-island and utility parallel), load sharing (multi-unit only) Manual and automatic paralleling capability Metering display: voltage, current, frequency, power factor, kW, WHM, kVAR, and synchroscope Basler BE1-11i is IEEE1547-2003 compliant in most applications
Quality	Factory testing of standard generator set and complete power module UL, NEMA, ISO and IEEE standards Full package CE certification available O&M manuals

XQ1475G RENTAL

SPECIFICATIONS

GENERATOR

Frame Size 826
Pitch 0.6667
No. of poles 4
Excitation . . . . . Static regulated brushless PM excited
Constructions . . . . . Double bearing, close coupled
Insulation. . . . . Class H
Enclosure . . . . . Drip proof IP22
Temperature rise . . . . . 105 deg C
Alignment. . . . . Pilot shaft
Overspeed capability – % of rated . . . . . 125% of rated
Voltage regulator . . . . . 3 phase sensing with Volts-per-Hertz
Voltage regulation. . . . . Less than ± 0.5% voltage gain
Adjustable to compensate for engine speed droop and line loss
Wave form deviation . . . . . Less than 3% deviation
Telephone Influence Factor (TIF). . . . . Less than 50
Harmonic Distortion (THD). . . . . Less than 5%

CAT G3516C LOW EMISSIONS GAS ENGINE

Number of Cylinders. V16
Bore – mm (in). 170 (6.7)
Stroke – mm (in) 190 (7.5)
Displacement – L (cu in) 69 (4,210)
Compression ratio. 11.3:1
Engine Speed (rpm). 1500/1800
Aspiration. . . . . Turbocharged Separate Circuit Aftercooled
Aftercooler Inlet (deg C) 92
Jacket Water Outlet (deg C). 98
Exhaust Manifold . . . . . Dry
Fuel system . . . . . Cat Low Pressure w/ Air Fuel Ratio Control
Governor type . . . . . ADEM™ A3 Control System
Combustion . . . . . Low Emission
Fuel . . . . . Natural Gas
Fuel Pressure Range (PSI) 3-7
Methane Number 55-100

TECHNICAL DATA*

Generator Set Technical Data	Units	50 Hz Continuous*		60 Hz Continuous*	
Power Rating	ekW	1475			
Lubrication System					
Lube Oil Refill Volume with filter change for standard sump	L (gal)	416 (110)			
Fuel System					
Fuel Consumption (ISO 3046/1)		Max VFD (50kW)	Min VFD (3kW)	Max VFD (50kW)	Min VFD (3kW)
100% load	MJ/ekW-hr	9.62	9.35	10.34	10.05
75% load	MJ/ekW-hr	9.92	9.57	10.74	10.39
50% load	MJ/ekW-hr	10.59	9.97	11.86	11.14
Altitude Capability					
At 25° C (77°) ambient, above sea level	m (ft)	1500 (4921)			
Cooling System					
Package ambient capability	° C (° F)	40 (104)		40 (104)	
Jacket water temperature (maximum outlet)	° C (° F)	99 (210)		99 (210)	
System coolant capacity	L (gal)	770 (203)		770 (203)	
System required airflow	m^3/min (ft^3/min)	2,604 (91,959)			
Exhaust System					
Combustion air inlet flow rate	m^3/min (ft^3/min)	116 (4,097)		111 (3,920)	
Exhaust stack gas temperature	° C (° F)	467 (877)		492 (918)	
Exhaust gas flow rate	Nm^3/min	113		118	
Sound Performance					
Noise rating @ 15 m (per SAE J1074)	dB(a)	72			
Emissions at 100% Load					
NO_x (as NO_2)(corr. 5% O_2)	mg/Nm^3 (dry)	500		453	
CO (corr. 5% O_2)	mg/Nm^3 (dry)	906		937	
THC (corr. 5% O_2)	mg/Nm^3 (dry)	2584		1521	
NMHC (corr. To 5% O_2)	mg/Nm^3 (dry)	388		228	
Exhaust O_2	% (dry)	9.9		9.3	

** Materials and specifications are subject to change without notice. Reference SRR GR-3500-158-02 For Max VFD Power and SRR GR-3500-157-02 for Min VFD Power Data at 50 Hz. Reference SRR GR-3500-136-00 For Max VFD Power and SRR GR-3500-137-00 for Min VFD Power Data at 60 Hz. 60 Hz emissions data pending factory testing results*

XQ1000 RENTAL

CATERPILLAR

Image shown may not reflect actual package

STANDBY 1000 kW
PRIME 910 kW

Frequency	Voltage	Standby kW (kVA)	Prime kW (kVA)
50 Hz	400V 3 Phase	800 ekW/ 1000 kVA	720/910
60 Hz	480/277V 3 Phase	1000/1250	910/1137
60 Hz	240/139V 3 Phase	1000/1250	910/1137
60 Hz	208/120V 3 Phase	863 ekW*/ 1075 kVA	863 ekW*/ 1075 kVA

FEATURES

Factory designed, certified prototype tested with torsional analysis. Production tested and delivered in a package that is ready to be connected to your fuel and power lines. Electric Power Design Pro computer sizing available. Supported 100% by your Caterpillar® dealer with warranty on parts and labor. Extended warranty available in some areas. The generator set is designed and manufactured in an ISO 9001:2000 compliant facility. Generator set and components meet or exceed the following specifications: AS1359, AS2789, ABGSM TM3, BS4999, DIN6271, DIN6280, EGSA101P, JEM1359, IEC 34/1, ISO3046/1, ISO8528, NEMA MG1-22

CATERPILLAR SR4B GENERATOR

Two bearing, wye-connected, static regulated, brushless permanent magnet excited generator designed to match the performance and output characteristics of the Caterpillar diesel engine that drives it.

RELIABLE, FUEL EFFICIENT DIESEL ENGINE

The compact, four-stroke-cycle diesel engine combines durability with minimum weight while providing dependability and economy. The fuel system operates on a variety of fuels.

CATERPILLAR COOLING SYSTEM

Sized compatible to rating with energy efficient fan and core.

CATERPILLAR SWITCHGEAR

Provides single unit and/or utility paralleling components. Standby, Load Sense/Load Demand, Import, Export, and Base Load modes.

EXCLUSIVE CATERPILLAR DIGITAL VOLTAGE REGULATOR (CDVR)

Three-phase sensing and adjustable Volts-per-Hertz regulation give precise control, excellent block loading, and constant voltage in the normal operating range.

ENVIRONMENTALLY FRIENDLY

110% full spill containment of all onboard fluids.

LINK BOARD ASSEMBLY

Set mounted generator multi-voltage adjust plate. Voltage nodes 208V*, 240V, 400V and 480V – wye configuration.

* Output limited by 3000 amp breaker at 208V

SOUND ATTENUATED CONTAINER

For ease of transportation and protection. Meets 78 dB(A) at 7 m or below per SAE J1074 measurement procedure.

XQ1000 RENTAL

CATERPILLAR®

FACTORY INSTALLED STANDARD EQUIPMENT

SYSTEM	STANDARD EQUIPMENT
Engine	EPA approved Tier 2 C-32 Caterpillar engine – 50/60 Hz capable Heavy duty air cleaner with service indicator 45-Amp charging alternator Fuel filters – primary and duplex secondary with integral water separator and change-over valve Lubricating oil system Jacket water heater Fuel cooler and priming pump Electronic ADEM™ A4 controls
Generator	Multi-voltage, dual frequency SR-4B brushless, three phase, 12-lead design Permanent magnet excited Digital Voltage Regulator Space heater Class H insulation operating at Class F temperature for extended life
Containerized Module	30' ISO high cube container, CSC certified 2-axle, 30' ISO container chassis Sound attenuated air intake louvers and 3 lockable personnel doors with panic release Bus bar access door, external access load connection bus bars Shore power connection via distribution block connections for jacket water heater, battery charger, space heaters, and generator condensate heaters Standard lighting 3 AC/3 DC, one (1) single duplex service receptacle, 2 external break-glass emergency stop push buttons Fuel tank UL listed, double wall, 14 hr runtime @ 75% load Sound attenuated 78 dB(A) @ 7 m, spill containment 110% of all onboard fluids Oversized maintenance-free battery, battery rack and 20-Amp battery charger Critical grade internally insulated exhaust silencer Vibration isolators, corrosion resistant hardware and hinges External drain access to standard fluids Standard Cat rental decals and painted standard Cat power module white
Cooling	Standard cooling provides >45° C ambient capability (50 Hz) or 43° C (60 Hz) at prime +10% rating Engine mounted, 38 split JW/CAC vertical radiator, vertical air discharge, and fuel cooler
Generator Paralleling Control	Custom switchgear control with EMCP 3.3 components automatic start/stop with cool down timer Protection: 32, 59, 27, 40, 810, 81U, 40, complete with device 15, 25, 65 & 90 Reverse compatibility module provided for interface to legacy power modules Touch screen controls with event log Multi-mode operation (island, multi-island and utility parallel), load sharing (multi-unit only) Import & export control (utility parallel only), manual and automatic paralleling capability Touch screen display (status and alarms) 3000-Amps circuit breaker, UL listed, electrically operated, fixed mounted, 3-phase, 50% rated neutral bus Metering display: voltage, current, frequency, power factor, kW, WHM, kVAR, and synchroscope 3000-Amps reconnectable link board for 208/240/400/480V – wye configuration
Quality	Standard genset and package factory tested UL, NEMA, ISO and IEEE standards O&M manuals

XQ1000 RENTAL

CATERPILLAR

SPECIFICATIONS

CAT SR4B GENERATOR

Frame Size 693
Excitation ..... Static regulated brushless PM excited
Constructions ..... Two bearing, close coupled
Insulation ..... Class H
Enclosure ..... Drip proof
Alignment ..... Pilot shaft
Overspeed capability – % of rated ..... 130% of rated
Wave deviation form 2%
Voltage regulator ..... 3 phase sensing with Volts-per-Hertz
Voltage regulation ..... Less than ± ½% voltage gain
Adjustable to compensate for engine speed droop and line loss
Wave form ..... Less than 5% deviation
Telephone Influence Factor (TIF) ..... Less than 50
Harmonic Distortion (THD) ..... Less than 3%

CAT C32 DIESEL ENGINE

C32 TA, V-12, 4-Stroke diesel
Bore – mm (in) 145 (5.71)
Stroke – mm (in) 162 (6.38)
Displacement – L (cu in) 32.10 (1,958.86)
Compression ratio 15:1
Aspiration ..... TA
Fuel system ..... MEUI
Governor type ..... Caterpillar ADEM™ A4 Control System

TECHNICAL DATA

		C32-30' XQ1000	
Power Rating		**Standby**	**Prime**
50 Hz	ekW (kVA)	800 (1,000)	728 (910)
60 Hz	ekW (kVA)	1000 (1,250)	910 (1,137)
Engine and Container Information			
Engine model		C32	
Container size	m (ft)	9 (30)	
Container dimensions	mm (in)	Length – 9144 (360)	
	mm (in)	Width – 2438 (96)	
	mm (in)	Height – 2896 (114)	
Fuel Capacity	L (gal)	4730 (1,250)	
Operation at 75% Load Factor	hours	21 (approx.)	
Approximate Weight – with Genset and Switchgear		Dry/Wet	
Including container	kg (lb)	16 136 (35,500)/17 727 (39,000)	
With optional undercarriage	kg (lb)	19 772 (43,500)/21 363 (47,000)	
Fuel Consumption @ 60 Hz			
100% rated load	L (gal)	252 (66.6)	
75% rated load	L (gal)	200.7 (53.0)	
50% rated load	L (gal)	139.3 (36.8)	
Fuel Consumption @ 50 Hz			
100% rated load	L (gal)		
75% rated load	L (gal)		
50% rated load	L (gal)		

Cat® C32
Diesel Generator Sets

Image shown may not reflect actual configuration

Bore – mm (in)	145 (5.7)
Stroke – mm (in)	162 (6.4)
Displacement – L (in³)	32 (1952.76)
Compression Ratio	15.0:1
Aspiration	TA
Fuel System	EUI
Governor Type	ADEM™ A4

Standby 60 Hz ekW (kVA)	Mission Critical 60 Hz ekW (kVA)	Prime 60 Hz ekW (kVA)	Continuous 60 Hz ekW (kVA)	Emissions Performance
1000 (1250)	1000 (1250)	910 (1137)	830 (1038)	Low Fuel Consumption

Standard Features

Cat® Diesel Engine
- Designed and optimized for low fuel consumption
- Reliable and consistent performance proven in thousands of applications worldwide

Generator Set Package
- Accepts 100% block load in one step and meets the NFPA 110 loading requirements
- Conforms to ISO 8528-5 G3 load acceptance requirements.
- Reliability is verified through prototype testing, which includes torsional vibration, fuel consumption, oil consumption, transient performance, and endurance testing

Alternators
- Superior motor starting capability minimizes the need for oversizing the generator
- Designed to match the performance and output characteristics of Cat diesel engines

Cooling System
- Cooling systems available to operate in ambient temperatures up to 50°C (122°F)
- Tested to ensure proper generator set cooling

EMCP 4 Control Panels
- User-friendly interface and navigation
- Scalable system to meet a wide range of installation requirements
- Expansion modules and site specific programming for specific customer requirements

Warranty
- 24 months/1000-hour warranty for standby and mission critical ratings
- 12 months/unlimited hour warranty for prime and continuous ratings
- Extended service protection is available to provide extended coverage options

Worldwide Product Support
- Cat dealers have over 1,800 dealer branch stores operating in 200 countries
- Your local Cat dealer provides extensive post-sale support, including maintenance and repair agreements

Financing
- Caterpillar offers an array of financial products to help you succeed through financial service excellence
- Options include loans, finance lease, operating lease, working capital, and revolving line of credit
- Contact your local Cat dealer for availability in your region

Optional Equipment

Engine

Air Cleaner

- ❑ Single element
- ❑ Dual element
- ❑ Heavy duty

Muffler

- ❑ Industrial grade (15 dB)

Starting

- ❑ Standard batteries
- ❑ Oversized batteries
- ❑ Standard electric starter
- ❑ Dual electric starter
- ❑ Jacket water heater

Alternator

Output voltage

- ❑ 220V ❑ 400V
- ❑ 240V ❑ 480V
- ❑ 380V ❑ 600V

Temperature Rise (over 40°C ambient)

- ❑ 150°C
- ❑ 125°C/130°C
- ❑ 105°C
- ❑ 80°C

Winding type

- ❑ Random wound
- ❑ Form wound

Excitation

- ❑ Self excited
- ❑ Internal excitation (IE)
- ❑ Permanent magnet (PM)

Attachments

- ❑ Anti-condensation heater
- ❑ Stator and bearing temperature monitoring and protection

Power Termination

Type

- ❑ Bus bar
- ❑ Circuit breaker
- ❑ 1600A ❑ 2000A
- ❑ 2500A ❑ 3200A
- ❑ 4000A ❑ 3-pole
- ❑ UL ❑ IEC
- ❑ Manually operated
- ❑ Electrically operated

Trip Unit

- ❑ LSI ❑ LSI-G
- ❑ LSIG-P

Control System

Controller

- ❑ EMCP 4.2
- ❑ EMCP 4.3
- ❑ EMCP 4.4

Attachments

- ❑ Local annunciator module
- ❑ Remote annunciator module
- ❑ Remote monitoring software

Charging

- ❑ Battery charger – 10A

Vibration Isolators

- ❑ Rubber
- ❑ Spring

Extended Service Options

Terms

- ❑ 2 year (prime)
- ❑ 3 year
- ❑ 5 year
- ❑ 10 year

Coverage

- ❑ Silver
- ❑ Gold
- ❑ Platinum
- ❑ Platinum Plus

Ancillary Equipment

- ❑ Automatic transfer switch (ATS)
- ❑ Uninterruptible power supply (UPS)
- ❑ Paralleling switchgear
- ❑ Paralleling controls

Note: *Some options may not be available on all models. Certifications may not be available with all model configurations. Consult factory for availability.*

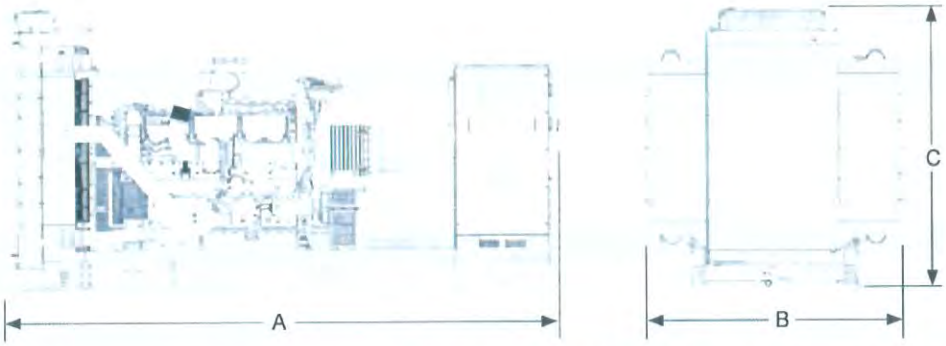
C32 Diesel Generator Sets
Electric Power

Package Performance

Performance	Standby	Mission Critical	Prime	Continuous
Frequency	60 Hz	60 Hz	60 Hz	60 Hz
Gen set power rating with fan	1000 ekW	1000 ekW	910 ekW	830 ekW
Gen set power rating with fan @ 0.8 power factor	1250 kVA	1250 kVA	1138 kVA	1038 kVA
Fueling strategy	Low Fuel	Low Fuel	Low Fuel	Low Fuel
Performance number	DM9939-01	EM0450-00	DM9940-02	DM9941-01
Fuel Consumption				
100% load with fan – L/hr (gal/hr)	262.7 (69.4)	262.7 (69.4)	238.6 (63.0)	217.9 (57.6)
75% load with fan – L/hr (gal/hr)	195.9 (51.7)	195.9 (51.7)	179.2 (47.3)	164.8 (43.5)
50% load with fan – L/hr (gal/hr)	135.9 (35.9)	135.9 (35.9)	125.8 (33.2)	117.2 (31.0)
25% load with fan – L/hr (gal/hr)	80.8 (21.3)	80.8 (21.3)	75.9 (20.0)	71.4 (18.9)
Cooling System				
Radiator air flow restriction (system) – kPa (in. water)	0.12 (0.48)	0.12 (0.48)	0.12 (0.48)	0.12 (0.48)
Radiator air flow – m³/min (cfm)	987 (34855)	987 (34855)	987 (34855)	987 (34855)
Engine coolant capacity – L (gal)	55 (14.5)	55 (14.5)	55 (14.5)	55 (14.5)
Radiator coolant capacity – L (gal)	171 (45.0)	171 (45.0)	171 (45.0)	171 (45.0)
Total coolant capacity – L (gal)	226 (59.5)	226 (59.5)	226 (59.5)	226 (59.5)
Inlet Air				
Combustion air inlet flow rate – m³/min (cfm)	82.6 (2915.6)	82.6 (2915.6)	77.8 (2746.7)	71.2 (2515.8)
Exhaust System				
Exhaust stack gas temperature – °C (°F)	473.4 (884.2)	473.4 (884.2)	456.1 (853.0)	452.0 (845.6)
Exhaust gas flow rate – m³/min (cfm)	214.7 (7582.8)	214.7 (7582.8)	196.0 (6922.5)	179.6 (6341.2)
Exhaust system backpressure (maximum allowable) – kPa (in. water)	6.7 (27.0)	6.7 (27.0)	6.7 (27.0)	6.7 (27.0)
Heat Rejection				
Heat rejection to jacket water – kW (Btu/min)	359 (20395)	359 (20395)	324 (18431)	305 (17363)
Heat rejection to exhaust (total) – kW (Btu/min)	965 (54857)	965 (54857)	866 (49230)	790 (44907)
Heat rejection to aftercooler – kW (Btu/min)	249 (14173)	249 (14173)	213 (12110)	172 (9774)
Heat rejection to atmosphere from engine – kW (Btu/min)	118 (6709)	118 (6709)	128 (7274)	130 (7370)
Heat rejection from alternator – kW (Btu/min)	55 (3131)	55 (3131)	50 (2846)	45 (2561)
Emissions (Nominal)				
NOx mg/Nm³ (g/hp-h)	3009.7 (6.09)	3009.7 (6.09)	3019.6 (6.09)	3099.7 (6.26)
CO mg/Nm³ (g/hp-h)	89.8 (0.18)	89.8 (0.18)	101.9 (0.21)	118.3 (0.24)
HC mg/Nm³ (g/hp-h)	5.1 (0.01)	5.1 (0.01)	5.3 (0.01)	8.2 (0.02)
PM mg/Nm³ (g/hp-h)	8.3 (0.02	8.3 (0.02	7.6 (0.02)	8.3 (0.02)
Emissions (Potential Site Variation)				
NOx mg/Nm³ (g/hp-h)	3641.8 (7.73)	3641.8 (7.73)	3653.7 (7.37)	3750.6 (7.57)
CO mg/Nm³ (g/hp-h)	168.0 (0.33	168.0 (0.33	190.6 (0.38)	221.3 (0.44)
HC mg/Nm³ (g/hp-h)	9.7 (0.02)	9.7 (0.02)	10.0 (0.02)	15.5 (0.04)
PM mg/Nm³ (g/hp-h)	16.2 (0.04)	16.2 (0.04)	14.8 (0.04)	16.2 (0.04)

C32 Diesel Generator Sets
Electric Power

Weights and Dimensions



Dim "A" mm (in)	Dim "B" mm (in)	Dim "C" mm (in)	Dry Weight kg (lb)
4270 (168.1)	2011 (79.2)	2174 (85.6)	6663 (14,690)

Note: *For reference only. Do not use for installation design. Contact your local Cat dealer for precise weights and dimensions.*

Ratings Definitions

Standby
Output available with varying load for the duration of the interruption of the normal source power. Average power output is 70% of the standby power rating. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year.

Mission Critical
Output available with varying load for the duration of the interruption of the normal source power. Average power output is 85% of the mission critical power rating. Typical peak demand up to 100% of rated power for up to 5% of the operating time. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year.

Prime
Output available with varying load for an unlimited time. Average power output is 70% of the prime power rating. Typical peak demand is 100% of prime rated ekW with 10% overload capability for emergency use for a maximum of 1 hour in 12. Overload operation cannot exceed 25 hours per year.

Continuous
Output available with non-varying load for an unlimited time. Average power output is 70-100% of the continuous power rating. Typical peak demand is 100% of continuous rated kW for 100% of the operating hours.

Applicable Codes and Standards
AS1359, CSA C22.2 No100-04, UL142, UL489, UL869, UL2200, NFPA37, NFPA70, NFPA99, NFPA110, IBC, IEC60034-1, ISO3046, ISO8528, NEMA MG1-22, NEMA MG1-33, 2014/35/EU, 2006/42/EC, 2014/30/EU.

Note: Codes may not be available in all model configurations. Please consult your local Cat dealer for availability.

Data Center Applications
Tier III/Tier IV compliant per Uptime Institute requirements. ANSI/TIA-942 compliant for Rated-1 through Rated-4 data centers.

Fuel Rates
Fuel rates are based on fuel oil of 35° API [16°C (60°F)] gravity having an LHV of 42,780 kJ/kg (18,390 Btu/lb) when used at 29°C (85°F) and weighing 838.9 g/liter (7.001 lbs/U.S. gal.)

www.cat.com/electricpower

C32-PGCG
LEHE1265-00 (4-17)

TO-1

THERMAL OXIDIZER SPECIFICATION SHEET

AZOTA, LTD.

Rev							
0	CUSTOMER:	SALT CREEK MIDSTREAM		JOB NUMBER: 19372		REVISION: 0	
0	PLANT NAME:	AMEREDEV - SOUTH AGI SITE		ITEM NUMBER: TO-7041		CASE:	
0	LOCATION:	LEA COUNTY, NEW MEXICO		PREPARED BY: EBO		DATE:	9/27/2019
0	SERVICE:	ACID GAS THERMAL OXIDIZER		CHECKED BY: JRG		DATE:	9/27/2019
0	MANUFACTURED BY:			APPROVED BY:		DATE:	
				PAGE:	1		1
0	1 TAG NUMBERS:	TO-7041	DELETED				
0	2 SERVICE:	4 MMSCFD CASE					FUEL GAS
0	3	NOTE 1					TO PILOTS
0	4						
0	5	**COMPOSITION (MOL %):**					
0	6 HYDROGEN SULFIDE	20.66%					0.00%
0	7 NITROGEN	0.00%					0.63%
0	8 CARBON DIOXIDE	71.76%					0.00%
0	9 WATER	7.24%					0.01%
0	10 METHANE	0.30%					84.00%
0	11 ETHANE	0.02%					9.76%
0	12 PROPANE	0.02%					3.49%
0	13 ISOBUTANE	0.00%					1.02%
0	14 N-BUTANE	0.00%					0.48%
0	15 ISOPENTANE	0.00%					0.24%
0	16 N-PENTANE	0.00%					0.23%
0	17 N-HEXANE	0.00%					0.16%
0	18						
0	19						
0	20 TOTAL:	100%					100%
0	21	**INLET FLOW CONDITIONS**					
0	22 FLOW (LB/HR):	17,573.6					AS NEEDED
0	23 VOLUME FLOW:	4.000 MMSCFD					
0	24 MOLE WEIGHT:	39.99					19.47
0	25 TEMPERATURE (°F):	120					80
0	26 PRESSURE (PSIA):	19.7 (NOTE 8)					89.7 (NOTE 8)
0	27	**DESIGN PARAMETERS**					
0	28 TYPE:	THERMAL OXIDIZER					
0	29 DRE:	99.9 % (NOTE 1)					
0	30						
0	31 ELEVATION, FT	3300					
0	32 BAR. PRESS, PSIA	13.03					
0	33 MAX TEMP., °F	105.00					
0	34 MIN TEMP., °F	-20.00					
0	35 WIND DESIGN	NOTE 7					
0	36 SEISMIC DESIGN	NOTE 7					
0	37						

0 38 **NOTES:**

0 39 1. DELETED

0 40 2. UNIT SHALL BE CAPABLE OF ACHIEVING 99.9% DESTRUCTION OF THE COMBUSTIBLE SPECIES IN DESIGN STREAM (VENDOR TO ADVISE)

0 41 3. VENDOR TO DESIGN FOR 10% ADDITIONAL FLOW AND 5% HIGHER HEATING VALUE FOR UPSET CASE

0 42 4. AVAILABLE POWER: FOR MOTORS: 480 V, 3 PHASE, 60 HZ

0 43 FOR CONTROLS: 120 V, 1 PHASE, 60 HZ

0 44 FOR INSTRUMENTS: 24 VDC

0 45 5. NO YELLOW METAL ALLOWED.

0 46 6. MINIMUM EMISSIONS REQUIREMENTS:

0 47 NOX 0.138 LB/MMBTU (HHV)

0 48 CO 0.082 LB/MMBTU (HHV)

0 49 VOC 99.9% DESTRUCTION FOR ALL COMBUSTIBLE SPECIES

0 50 7. SITE CONDITIONS: ELEVATION 3300 FT, AMBIENT TEMPS F, 105 MAX TO -20 F MIN

0 51 FROST DEPTH, 24", SNOW LOAD, 20 PSF

0 52 SEISMIC LOAD: ASCE 7-16, SOIL CLASS. = D, SEISMIC DESIGN CATEGORY = A SS = 0.11, S1 = 0.033, SMS = 0.175, SM1 = 0.075, SDS = 0.117, SDS = 0.053

0 53 WIND LOAD: ASCE 7-16, RISK CATEGORY = III, WIND SPEED = 112 MPH

0 54 8. VALUE REPRESENTS UPPER LIMIT OF DELIVERY PRESSURE. VENDOR TO SPECIFY REQUIRED DELIVERY PRESSURE FOR ALL STREAMS

0 55

0 56

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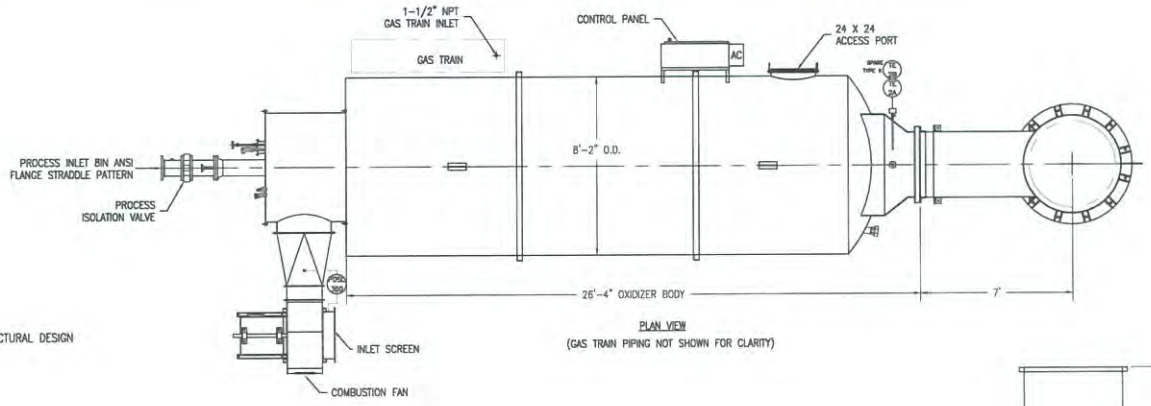
0 62

0 63

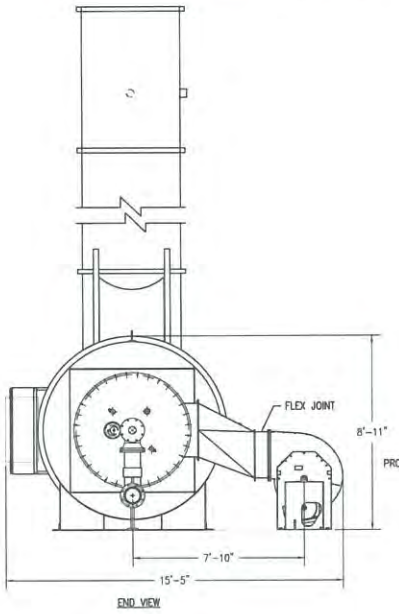
DESIGN SPECIFICATIONS
PROCESS: ACID GAS
WASTE STREAM FLOW RATE:
4MMSCFD MAXIMUM
DESIGN FLOW: MAXIMUM FLOW PLUS 10% ADDITIONAL
WASTE STREAM TEMPERATURE: 120°F
WASTE STREAM PRESSURE: 16.2 PSIA MIN.
WASTE STREAM POLLUTANT LOADING: 21MMBTU/HR
WASTE STREAM POLLUTANTS:
HYDROGEN SULFIDE, METHANE, ETHANE, PROPANE
SITE LOCATION: OUTDOORS, LEA COUNTY, NEW MEXICO
OPERATION: CONTINUOUS
SITE CLASSIFICATION: GENERAL PURPOSE
STACK EMISSIONS PERFORMANCE GOALS:
VOC DESTRUCTION: 99.9%

UTILITIES:
NATURAL GAS: 8MMBTU/HR MAX.
NATURAL GAS PRESSURE: 40 PSIG
ELECTRICAL POWER: 480/3/60, 25.2 FLA
INSTRUMENT AIR: 3 CFM @ 80 PSIG

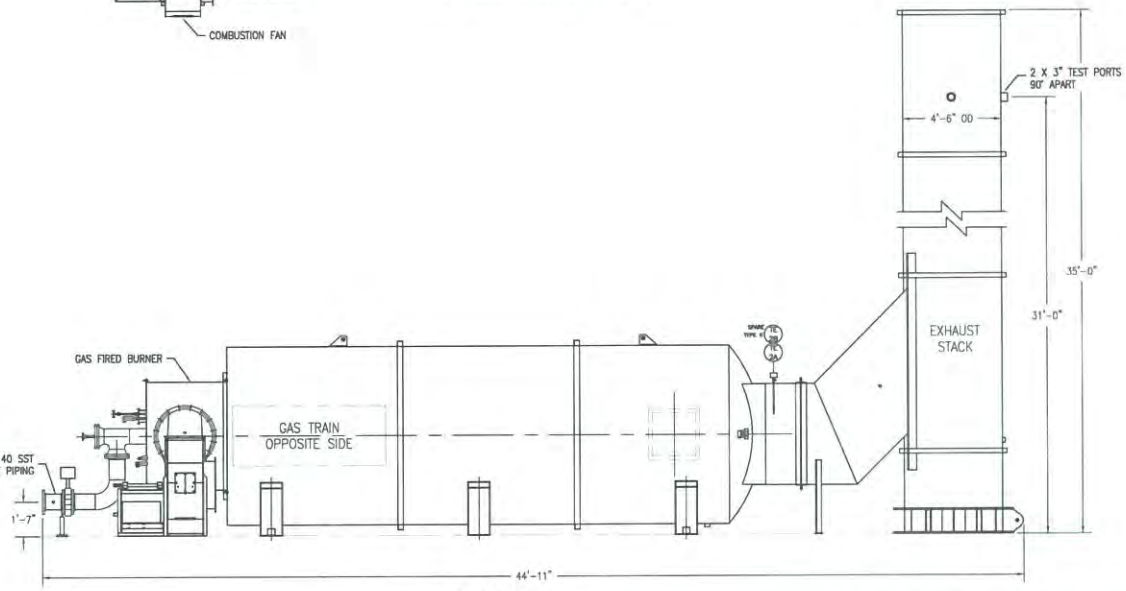
ESTIMATED OPERATING WEIGHTS:
THERMAL OXIDIZER ASSEMBLY: 20,000 LBS
COMBUSTION FAN: 850 LBS
STACK: 7,700 LBS ESTIMATED
MAY VARY UPON FINAL STRUCTURAL DESIGN



PLAN VIEW
(GAS TRAIN PIPING NOT SHOWN FOR CLARITY)



END VIEW



SIDE ELEVATION VIEW

REV.	DESCRIPTION	BY	APP.	DATE
K				
J				
H				
G				
F				
E				
D				
C				
B				
A				

UNLESS OTHERWISE SPECIFIED TOLERANCES:
ONE PLACE DECIMAL ±0.1
TWO PLACE DECIMAL ±0.05
THREE PLACE DECIMAL ±0.005
ANGULAR ± 1/2°
FINISHED SURF. 125√
REAMED HOLES 63 √
BREAK SHARP EDGES 1/32" CONCENTRICITY 0.001" T.I.R.

DRAWN BY: BT
CHECKED BY:
APPROVED:
DATE: 9/30/19
SCALE:

Pollution Systems
2170 Buckthorne Place
Suite 160
The Woodlands, Texas 77380
Phone: 713-574-6961 Fax: 713-458-2666
E-mail: Sales@PollutionSystems.com
www.PollutionSystems.com

AZOTA
THERMAL OXIDIZER HCFE-21
GENERAL ARRANGEMENT

PROJECT NUMBER	DRAWING	SHEET	REV	SIZE
C19-0927-01	100	1 OF 1	0	B

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 $lb/10^6$ 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.

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. $CO_2[lb/10^6 scf] = (3.67)(CON)(C)(D)$, where CON = fractional conversion of fuel carbon to CO_2, C = carbon content of fuel by weight (0.76), and D = density of fuel, $4.2x10^4$ $lb/10^6$ 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.

TABLE 1.4-3. EMISSION FACTORS FOR SPECIATED ORGANIC COMPOUNDS FROM NATURAL GAS COMBUSTION[a]

CAS No.	Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
91-57-6	2-Methylnaphthalene[b, c]	2.4E-05	D
56-49-5	3-Methylcholanthrene[b, c]	<1.8E-06	E
	7,12-Dimethylbenz(a)anthracene[b,c]	<1.6E-05	E
83-32-9	Acenaphthene[b,c]	<1.8E-06	E
203-96-8	Acenaphthylene[b,c]	<1.8E-06	E
120-12-7	Anthracene[b,c]	<2.4E-06	E
56-55-3	Benz(a)anthracene[b,c]	<1.8E-06	E
71-43-2	Benzene[b]	2.1E-03	B
50-32-8	Benzo(a)pyrene[b,c]	<1.2E-06	E
205-99-2	Benzo(b)fluoranthene[b,c]	<1.8E-06	E
191-24-2	Benzo(g,h,i)perylene[b,c]	<1.2E-06	E
207-08-9	Benzo(k)fluoranthene[b,c]	<1.8E-06	E
106-97-8	Butane	2.1E+00	E
218-01-9	Chrysene[b,c]	<1.8E-06	E
53-70-3	Dibenzo(a,h)anthracene[b,c]	<1.2E-06	E
25321-22-6	Dichlorobenzene[b]	1.2E-03	E
74-84-0	Ethane	3.1E+00	E
206-44-0	Fluoranthene[b,c]	3.0E-06	E
86-73-7	Fluorene[b,c]	2.8E-06	E
50-00-0	Formaldehyde[b]	7.5E-02	B
110-54-3	Hexane[b]	1.8E+00	E
193-39-5	Indeno(1,2,3-cd)pyrene[b,c]	<1.8E-06	E
91-20-3	Naphthalene[b]	6.1E-04	E
109-66-0	Pentane	2.6E+00	E
85-01-8	Phenanathrene[b,c]	1.7E-05	D
74-98-6	Propane	1.6E+00	E

TABLE 1.4-3. EMISSION FACTORS FOR SPECIATED ORGANIC COMPOUNDS FROM NATURAL GAS COMBUSTION (Continued)

CAS No.	Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
129-00-0	Pyrene[b, c]	5.0E-06	E
108-88-3	Toluene[b]	3.4E-03	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 $1b/10^6$ scf to lb/MMBtu, divide by 1,020. Emission Factors preceeded with a less-than symbol are based on method detection limits.

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

[c] HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.

[d] The sum of individual organic compounds may exceed the VOC and TOC emission factors due to differences in test methods and the availability of test data for each pollutant.

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:

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

[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 ≤ 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.

Since flares do not lend themselves to conventional emission testing techniques, only a few attempts have been made to characterize flare emissions. Recent EPA tests using propylene as flare gas indicated that efficiencies of 98 percent can be achieved when burning an offgas with at least 11,200 kJ/m^3 (300 Btu/ft^3). The tests conducted on steam-assisted flares at velocities as low as 39.6 meters per minute (m/min) (130 ft/min) to 1140 m/min (3750 ft/min), and on air-assisted flares at velocities of 180 m/min (617 ft/min) to 3960 m/min (13,087 ft/min) indicated that variations in incoming gas flow rates have no effect on the combustion efficiency. Flare gases with less than 16,770 kJ/m^3 (450 Btu/ft^3) do not smoke.

Table 13.5-1 presents flare emission factors, and Table 13.5-2 presents emission composition data obtained from the EPA tests.[1] Crude propylene was used as flare gas during the tests. Methane was a major fraction of hydrocarbons in the flare emissions, and acetylene was the dominant intermediate hydrocarbon species. Many other reports on flares indicate that acetylene is always formed as a stable intermediate product. The acetylene formed in the combustion reactions may react further with hydrocarbon radicals to form polyacetylenes followed by polycyclic hydrocarbons.[2]

In flaring waste gases containing no nitrogen compounds, NO is formed either by the fixation of atmospheric nitrogen (N) with oxygen (O) or by the reaction between the hydrocarbon radicals present in the combustion products and atmospheric nitrogen, by way of the intermediate stages, HCN, CN, and OCN.[2] Sulfur compounds contained in a flare gas stream are converted to SO_2 when burned. The amount of SO_2 emitted depends directly on the quantity of sulfur in the flared gases.

Table 13.5-1 (English Units). EMISSION FACTORS FOR FLARE OPERATIONS[a]

EMISSION FACTOR RATING: B

Component	Emission Factor (lb/10^6 Btu)
Total hydrocarbons[b]	0.14
Carbon monoxide	0.37
Nitrogen oxides	0.068
Soot[c]	0 - 274

[a] Reference 1. Based on tests using crude propylene containing 80% propylene and 20% propane.
[b] Measured as methane equivalent.
[c] Soot in concentration values: nonsmoking flares, 0 micrograms per liter (μg/L); lightly smoking flares, 40 μg/L; average smoking flares, 177 μg/L; and heavily smoking flares, 274 μg/L.

Table A-6. TCEQ Air Permits Flare Emission Factors

Contaminant	Assist Type	Waste Gas Stream Net Heating Value[a,b]	Emission Factor
NO_x	Steam	High Btu	0.0485 lb/MMBtu
		Low Btu	0.068 lb/MMBtu
	Air or Unassisted	High Btu	0.138 lb/MMBtu
		Low Btu	0.0641 lb/MMBtu
CO	Steam	High Btu	0.3503 lb/MMBtu
		Low Btu	0.3465 lb/MMBtu
	Air or Unassisted	High Btu	0.2755 lb/MMBtu
		Low Btu	0.5496 lb/MMBtu

[a] High Btu: > 1000 Btu/scf

[b] Low Btu: 192–1000 Btu/scf

Calculate emissions using the most accurate data for the gas flow rate and composition available. (See "Flared Gas Flow Rate and Composition" earlier in this supplement for more information on preferred data.)

Regardless of the data's source, the determination methodology for NO_x and CO emissions must be reported as "A" for 'TCEQ-approved factor.'

For flares subject to the HRVOC regulations in Chapter 115, Subchapter H, use the net heating value data required by 30 TAC 115.725 and 115.726 to determine NO_x and CO emissions for any portions of 2011 during which HRVOC monitors were installed and operational.

Uncombusted Flared Gas Emissions

Uncombusted flared gas emissions usually include VOCs, H_2S, or both. Emissions calculations for these contaminants are based on the flared gas flow rate and composition, and the appropriate destruction efficiency, which depends upon the actual flare operation.

Destruction Efficiencies

Flare destruction efficiency varies with flame stability, operating conditions, flare tip size and design, the specific compounds being combusted, and gas composition. The EPA has determined operating limits (see 40 CFR 60.18), that result in stable operation of flare flames. Therefore, emission determinations may vary depending on whether the criteria of 40 CFR 60.18 are satisfied. Chapter 115 HRVOC regulations address flare operational requirements in regard to 40 CFR 60.18. For

TABLE 2-8. OIL AND GAS PRODUCTION OPERATIONS SCREENING RANGES EMISSION FACTORS

Equipment type	Service[b]	≥10,000 ppmv Emission factor (kg/hr/source)[a]	<10,000 ppmv Emission factor (kg/hr/source)[a]
Valves	Gas	9.8E-02	2.5E-05
	Heavy Oil	NA	8.4E-06
	Light Oil	8.7E-02	1.9E-05
	Water/Oil	6.4E-02	9.7E-06
Pump seals	Gas	7.4E-02	3.5E-04
	Heavy Oil	NA	NA
	Light Oil	1.0E-01	5.1E-04
	Water/Oil	NA	2.4E-05
Others[c]	Gas	8.9E-02	1.2E-04
	Heavy Oil	NA	3.2E-05
	Light Oil	8.3E-02	1.1E-04
	Water/Oil	6.9E-02	5.9E-05
Connectors	Gas	2.6E-02	1.0E-05
	Heavy Oil	NA	7.5E-06
	Light Oil	2.6E-02	9.7E-06
	Water/Oil	2.8E-02	1.0E-05
Flanges	Gas	8.2E-02	5.7E-06
	Heavy Oil	NA	3.9E-07
	Light Oil	7.3E-02	2.4E-06
	Water/Oil	NA	2.9E-06
Open-ended lines	Gas	5.5E-02	1.5E-05
	Heavy Oil	3.0E-02	7.2E-06
	Light Oil	4.4E-02	1.4E-05
	Water/Oil	3.0E-02	3.5E-06

[a]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 offshore facilities. "NA" indicates that not enough data were available to develop the indicated emission factor.

[b]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.

[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.

loading operation, resulting in high levels of vapor generation and loss. If the turbulence is great enough, liquid droplets will be entrained in the vented vapors.

A second method of loading is submerged loading. Two types are the submerged fill pipe method and the bottom loading method. In the submerged fill pipe method, the fill pipe extends almost to the bottom of the cargo tank. In the bottom loading method, a permanent fill pipe is attached to the cargo tank bottom. During most of submerged loading by both methods, the fill pipe opening is below the liquid surface level. Liquid turbulence is controlled significantly during submerged loading, resulting in much lower vapor generation than encountered during splash loading.

The recent loading history of a cargo carrier is just as important a factor in loading losses as the method of loading. If the carrier has carried a nonvolatile liquid such as fuel oil, or has just been cleaned, it will contain vapor-free air. If it has just carried gasoline and has not been vented, the air in the carrier tank will contain volatile organic vapors, which will be expelled during the loading operation along with newly generated vapors.

Cargo carriers are sometimes designated to transport only one product, and in such cases are practicing "dedicated service". Dedicated gasoline cargo tanks return to a loading terminal containing air fully or partially saturated with vapor from the previous load. Cargo tanks may also be "switch loaded" with various products, so that a nonvolatile product being loaded may expel the vapors remaining from a previous load of a volatile product such as gasoline. These circumstances vary with the type of cargo tank and with the ownership of the carrier, the petroleum liquids being transported, geographic location, and season of the year.

One control measure for vapors displaced during liquid loading is called "vapor balance service", in which the cargo tank retrieves the vapors displaced during product unloading at bulk plants or service stations and transports the vapors back to the loading terminal. Figure 5.2-5 shows a tank truck in vapor balance service filling a service station underground tank and taking on displaced gasoline vapors for return to the terminal. A cargo tank returning to a bulk terminal in vapor balance service normally is saturated with organic vapors, and the presence of these vapors at the start of submerged loading of the tanker truck results in greater loading losses than encountered during nonvapor balance, or "normal", service. Vapor balance service is usually not practiced with marine vessels, although some vessels practice emission control by means of vapor transfer within their own cargo tanks during ballasting operations, discussed below.

Emissions from loading petroleum liquid can be estimated (with a probable error of ±30 percent)[4] using the following expression:

$$L_L = 12.46 \frac{SPM}{T} \quad (1)$$

where:

L_L = loading loss, pounds per 1000 gallons ($lb/10^3$ gal) of liquid loaded

S = a saturation factor (see Table 5.2-1)
P = true vapor pressure of liquid loaded, pounds per square inch absolute (psia) (see Section 7.1, "Organic Liquid Storage Tanks")
M = molecular weight of vapors, pounds per pound-mole (lb/lb-mole) (see Section 7.1, "Organic Liquid Storage Tanks")
T = temperature of bulk liquid loaded, °R (°F + 460)

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: DHY-1
File Name: Z:\PROJECTS\Salt Creek Midstream\SCM2019-0001 Ameredev\NSR Permit Application 2019\Emissions Calculations\GRI Calc\Ameredev.ddf
Date: November 20, 2019

DESCRIPTION:

Description:

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Hydrogen Sulfide	0.0005	0.011	0.0020
Methane	0.1116	2.678	0.4887
Ethane	0.0797	1.913	0.3491
Propane	0.1972	4.733	0.8637
Isobutane	0.2037	4.889	0.8922
n-Butane	0.2982	7.157	1.3062
Isopentane	0.2239	5.374	0.9808
n-Pentane	0.1491	3.579	0.6532
Cyclopentane	0.0986	2.366	0.4317
n-Hexane	0.3327	7.984	1.4572
Cyclohexane	0.3063	7.352	1.3418
Heptanes	0.1794	4.305	0.7857
Methylcyclohexane	0.2778	6.667	1.2168
2,2,4-Trimethylpentane	0.0040	0.095	0.0174
Benzene	2.1423	51.415	9.3833
Toluene	2.6712	64.108	11.6997
Ethylbenzene	0.1198	2.875	0.5247
Xylenes	3.0414	72.993	13.3212
C8+ Heavies	0.4722	11.334	2.0684
Total Emissions	10.9095	261.829	47.7838
Total Hydrocarbon Emissions	10.9091	261.818	47.7818
Total VOC Emissions	10.7178	257.227	46.9439
Total HAP Emissions	8.3113	199.471	36.4034
Total BTEX Emissions	7.9746	191.391	34.9289

FLASH GAS EMISSIONS

Note: Flash Gas Emissions are zero with the Recycle/recompression control option.

FLASH TANK OFF GAS

Component	lbs/hr	lbs/day	tons/yr
Hydrogen Sulfide	0.0001	0.003	0.0006
Methane	2.4767	59.441	10.8480

Ethane	0.6256	15.015	2.7403
Propane	0.5006	12.015	2.1928
Isobutane	0.3686	8.846	1.6145
n-Butane	0.4046	9.711	1.7723
Isopentane	0.2780	6.672	1.2176
n-Pentane	0.1495	3.588	0.6547
Cyclopentane	0.0335	0.804	0.1466
n-Hexane	0.1995	4.788	0.8738
Cyclohexane	0.0601	1.443	0.2634
Heptanes	0.0598	1.435	0.2619
Methylcyclohexane	0.0437	1.050	0.1916
2,2,4-Trimethylpentane	0.0027	0.065	0.0118
Benzene	0.0375	0.901	0.1644
Toluene	0.0325	0.781	0.1425
Ethylbenzene	0.0009	0.022	0.0039
Xylenes	0.0141	0.339	0.0619
C8+ Heavies	0.0197	0.474	0.0865
Total Emissions	5.3080	127.392	23.2491
Total Hydrocarbon Emissions	5.3079	127.389	23.2485
Total VOC Emissions	2.2055	52.933	9.6602
Total HAP Emissions	0.2873	6.895	1.2583
Total BTEX Emissions	0.0851	2.042	0.3727

EQUIPMENT REPORTS:

ABSORBER

Calculated Absorber Stages:	4.39	
Specified Dry Gas Dew Point:	2.87	lbs. H2O/MMSCF
Temperature:	119.9	deg. F
Pressure:	1223.7	psig
Dry Gas Flow Rate:	44.0000	MMSCF/day
Glycol Losses with Dry Gas:	3.7797	lb/hr
Wet Gas Water Content:	Subsaturated	
Specified Wet Gas Water Content:	85.57	lbs. H2O/MMSCF
Calculated Lean Glycol Recirc. Ratio:	0.59	gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	3.35%	96.65%
Carbon Dioxide	99.95%	0.05%
Hydrogen Sulfide	99.76%	0.24%
Nitrogen	100.00%	0.00%
Methane	100.00%	0.00%
Ethane	99.99%	0.01%
Propane	99.99%	0.01%
Isobutane	99.98%	0.02%
n-Butane	99.98%	0.02%
Isopentane	99.98%	0.02%
n-Pentane	99.98%	0.02%
Cyclopentane	99.91%	0.09%
n-Hexane	99.97%	0.03%
Cyclohexane	99.88%	0.12%
Heptanes	99.96%	0.04%

Methylcyclohexane	99.89%	0.11%
2,2,4-Trimethylpentane	99.98%	0.02%
Benzene	98.83%	1.17%
Toluene	98.57%	1.43%
Ethylbenzene	98.49%	1.51%
Xylenes	97.81%	2.19%
C8+ Heavies	99.91%	0.09%

FLASH TANK

Flash Control: Recycle/recompression
Flash Temperature: 116.0 deg. F
Flash Pressure: 50.0 psig

Component	Left in Glycol	Removed in Flash Gas
Water	99.97%	0.03%
Carbon Dioxide	38.97%	61.03%
Hydrogen Sulfide	78.17%	21.83%
Nitrogen	3.66%	96.34%
Methane	4.31%	95.69%
Ethane	11.30%	88.70%
Propane	28.26%	71.74%
Isobutane	35.59%	64.41%
n-Butane	42.43%	57.57%
Isopentane	44.89%	55.11%
n-Pentane	50.19%	49.81%
Cyclopentane	74.77%	25.23%
n-Hexane	62.70%	37.30%
Cyclohexane	84.12%	15.88%
Heptanes	75.12%	24.88%
Methylcyclohexane	86.94%	13.06%
2,2,4-Trimethylpentane	60.11%	39.89%
Benzene	98.36%	1.64%
Toluene	98.89%	1.11%
Ethylbenzene	99.33%	0.67%
Xylenes	99.60%	0.40%
C8+ Heavies	96.47%	3.53%

REGENERATOR

No Stripping Gas used in regenerator.

Component	Remaining in Glycol	Distilled Overhead
Water	4.76%	95.24%
Carbon Dioxide	0.00%	100.00%
Hydrogen Sulfide	0.00%	100.00%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%
Propane	0.00%	100.00%
Isobutane	0.00%	100.00%
n-Butane	0.00%	100.00%
Isopentane	1.11%	98.89%

n-Pentane	1.00%	99.00%
Cyclopentane	0.67%	99.33%
n-Hexane	0.80%	99.20%
Cyclohexane	3.80%	96.20%
Heptanes	0.67%	99.33%
Methylcyclohexane	4.60%	95.40%
2,2,4-Trimethylpentane	2.50%	97.50%
Benzene	5.08%	94.92%
Toluene	7.99%	92.01%
Ethylbenzene	10.47%	89.53%
Xylenes	12.95%	87.05%
C8+ Heavies	12.44%	87.56%

STREAM REPORTS:

WET GAS STREAM

Temperature: 119.91 deg. F
Pressure: 1238.40 psia
Flow Rate: 1.84e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.80e-001	1.57e+002
Carbon Dioxide	1.86e+000	3.97e+003
Hydrogen Sulfide	1.49e-004	2.46e-001
Nitrogen	5.40e-001	7.32e+002
Methane	8.55e+001	6.64e+004
Ethane	5.12e+000	7.45e+003
Propane	2.27e+000	4.85e+003
Isobutane	1.23e+000	3.47e+003
n-Butane	1.20e+000	3.38e+003
Isopentane	8.16e-001	2.85e+003
n-Pentane	3.89e-001	1.36e+003
Cyclopentane	4.57e-002	1.55e+002
n-Hexane	4.38e-001	1.83e+003
Cyclohexane	7.52e-002	3.07e+002
Heptanes	1.18e-001	5.72e+002
Methylcyclohexane	6.19e-002	2.94e+002
2,2,4-Trimethylpentane	6.88e-003	3.80e+001
Benzene	4.94e-002	1.87e+002
Toluene	4.24e-002	1.89e+002
Ethylbenzene	1.56e-003	8.02e+000
Xylenes	2.72e-002	1.40e+002
C8+ Heavies	6.78e-002	5.59e+002
Total Components	100.00	9.88e+004

DRY GAS STREAM

Temperature: 119.91 deg. F
Pressure: 1238.40 psia
Flow Rate: 1.83e+006 scfh

Component	Conc.	Loading

	(vol%)	(lb/hr)
Water	6.06e-003	5.27e+000
Carbon Dioxide	1.86e+000	3.96e+003
Hydrogen Sulfide	1.49e-004	2.45e-001
Nitrogen	5.41e-001	7.32e+002
Methane	8.56e+001	6.63e+004
Ethane	5.13e+000	7.45e+003
Propane	2.28e+000	4.85e+003
Isobutane	1.24e+000	3.47e+003
n-Butane	1.20e+000	3.38e+003
Isopentane	8.17e-001	2.85e+003
n-Pentane	3.90e-001	1.36e+003
Cyclopentane	4.57e-002	1.55e+002
n-Hexane	4.39e-001	1.83e+003
Cyclohexane	7.53e-002	3.06e+002
Heptanes	1.18e-001	5.72e+002
Methylcyclohexane	6.19e-002	2.94e+002
2,2,4-Trimethylpentane	6.89e-003	3.80e+001
Benzene	4.89e-002	1.85e+002
Toluene	4.19e-002	1.86e+002
Ethylbenzene	1.54e-003	7.90e+000
Xylenes	2.67e-002	1.37e+002
C8+ Heavies	6.78e-002	5.58e+002
Total Components	100.00	9.87e+004

LEAN GLYCOL STREAM

Temperature: 119.91 deg. F
Flow Rate: 1.50e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.90e+001	8.35e+002
Water	9.00e-001	7.60e+000
Carbon Dioxide	2.21e-011	1.87e-010
Hydrogen Sulfide	6.90e-015	5.82e-014
Nitrogen	3.84e-013	3.24e-012
Methane	1.03e-017	8.70e-017
Ethane	3.95e-008	3.33e-007
Propane	3.37e-009	2.84e-008
Isobutane	2.04e-009	1.72e-008
n-Butane	2.07e-009	1.74e-008
Isopentane	2.99e-004	2.52e-003
n-Pentane	1.78e-004	1.50e-003
Cyclopentane	7.87e-005	6.64e-004
n-Hexane	3.17e-004	2.67e-003
Cyclohexane	1.44e-003	1.21e-002
Heptanes	1.43e-004	1.20e-003
Methylcyclohexane	1.59e-003	1.34e-002
2,2,4-Trimethylpentane	1.20e-005	1.01e-004
Benzene	1.36e-002	1.15e-001
Toluene	2.75e-002	2.32e-001
Ethylbenzene	1.66e-003	1.40e-002
Xylenes	5.36e-002	4.52e-001
C8+ Heavies	7.95e-003	6.71e-002
Total Components	100.00	8.44e+002

RICH GLYCOL STREAM

Temperature: 119.91 deg. F
Pressure: 1238.40 psia
Flow Rate: 1.84e+000 gpm
NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
TEG	8.24e+001	8.35e+002
Water	1.57e+001	1.59e+002
Carbon Dioxide	1.84e-001	1.87e+000
Hydrogen Sulfide	5.74e-005	5.82e-004
Nitrogen	3.19e-003	3.23e-002
Methane	2.55e-001	2.59e+000
Ethane	6.96e-002	7.05e-001
Propane	6.88e-002	6.98e-001
Isobutane	5.65e-002	5.72e-001
n-Butane	6.93e-002	7.03e-001
Isopentane	4.98e-002	5.04e-001
n-Pentane	2.96e-002	3.00e-001
Cyclopentane	1.31e-002	1.33e-001
n-Hexane	5.28e-002	5.35e-001
Cyclohexane	3.74e-002	3.79e-001
Heptanes	2.37e-002	2.40e-001
Methylcyclohexane	3.30e-002	3.35e-001
2,2,4-Trimethylpentane	6.67e-004	6.76e-003
Benzene	2.26e-001	2.29e+000
Toluene	2.90e-001	2.94e+000
Ethylbenzene	1.33e-002	1.35e-001
Xylenes	3.46e-001	3.51e+000
C8+ Heavies	5.52e-002	5.59e-001
Total Components	100.00	1.01e+003

FLASH TANK OFF GAS STREAM

Temperature: 116.00 deg. F
Pressure: 64.70 psia
Flow Rate: 9.13e+001 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	9.28e-001	4.02e-002
Carbon Dioxide	1.08e+001	1.14e+000
Hydrogen Sulfide	1.55e-003	1.27e-004
Nitrogen	4.62e-001	3.12e-002
Methane	6.41e+001	2.48e+000
Ethane	8.64e+000	6.26e-001
Propane	4.72e+000	5.01e-001
Isobutane	2.63e+000	3.69e-001
n-Butane	2.89e+000	4.05e-001
Isopentane	1.60e+000	2.78e-001
n-Pentane	8.61e-001	1.49e-001
Cyclopentane	1.98e-001	3.35e-002
n-Hexane	9.62e-001	1.99e-001
Cyclohexane	2.97e-001	6.01e-002

Heptanes	2.48e-001	5.98e-002
Methylcyclohexane	1.85e-001	4.37e-002
2,2,4-Trimethylpentane	9.81e-003	2.70e-003
Benzene	2.00e-001	3.75e-002
Toluene	1.47e-001	3.25e-002
Ethylbenzene	3.52e-003	9.00e-004
Xylenes	5.53e-002	1.41e-002
C8+ Heavies	4.81e-002	1.97e-002
Total Components	100.00	6.52e+000

FLASH TANK GLYCOL STREAM

Temperature: 116.00 deg. F
Flow Rate: 1.82e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)	(ppm)
TEG	8.29e+001	8.35e+002	829194.
Water	1.58e+001	1.59e+002	158342.
Carbon Dioxide	7.23e-002	7.28e-001	723.
Hydrogen Sulfide	4.52e-005	4.55e-004	0.
Nitrogen	1.18e-004	1.18e-003	1.
Methane	1.11e-002	1.12e-001	111.
Ethane	7.92e-003	7.97e-002	79.
Propane	1.96e-002	1.97e-001	196.
Isobutane	2.02e-002	2.04e-001	202.
n-Butane	2.96e-002	2.98e-001	296.
Isopentane	2.25e-002	2.26e-001	225.
n-Pentane	1.50e-002	1.51e-001	150.
Cyclopentane	9.85e-003	9.92e-002	99.
n-Hexane	3.33e-002	3.35e-001	333.
Cyclohexane	3.16e-002	3.18e-001	316.
Heptanes	1.79e-002	1.81e-001	179.
Methylcyclohexane	2.89e-002	2.91e-001	289.
2,2,4-Trimethylpentane	4.04e-004	4.06e-003	4.
Benzene	2.24e-001	2.26e+000	2241.
Toluene	2.88e-001	2.90e+000	2883.
Ethylbenzene	1.33e-002	1.34e-001	133.
Xylenes	3.47e-001	3.49e+000	3469.
C8+ Heavies	5.36e-002	5.39e-001	536.
Total Components	100.00	1.01e+003	1000000.

FLASH GAS EMISSIONS

Control Method: Recycle/recompression
Control Efficiency: 100.00

Note: Flash Gas Emissions are zero with the Recycle/recompression control option.

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
Pressure: 14.70 psia
Flow Rate: 3.26e+003 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	9.83e+001	1.52e+002
Carbon Dioxide	1.93e-001	7.28e-001
Hydrogen Sulfide	1.56e-004	4.55e-004
Nitrogen	4.93e-004	1.18e-003
Methane	8.11e-002	1.12e-001
Ethane	3.09e-002	7.97e-002
Propane	5.21e-002	1.97e-001
Isobutane	4.09e-002	2.04e-001
n-Butane	5.98e-002	2.98e-001
Isopentane	3.62e-002	2.24e-001
n-Pentane	2.41e-002	1.49e-001
Cyclopentane	1.64e-002	9.86e-002
n-Hexane	4.50e-002	3.33e-001
Cyclohexane	4.24e-002	3.06e-001
Heptanes	2.09e-002	1.79e-001
Methylcyclohexane	3.30e-002	2.78e-001
2,2,4-Trimethylpentane	4.04e-004	3.96e-003
Benzene	3.20e-001	2.14e+000
Toluene	3.38e-001	2.67e+000
Ethylbenzene	1.32e-002	1.20e-001
Xylenes	3.34e-001	3.04e+000
C8+ Heavies	3.23e-002	4.72e-001
Total Components	100.00	1.64e+002

BLENDED STREAMS FROM COMPRESSION – MAX H2S

Properties	111-H	
Mole Fraction Vapor	100	%
Temperature	120	°F
Pressure	1232*	psig
Std Vapor Volumetric Flow	11*	MMSCFD
Composition	111-H	
H2S(Mole Fraction)	2.3781*	%
Nitrogen(Mole Fraction)	0.3859*	%
CO2(Mole Fraction)	12*	%
Methane(Mole Fraction)	76.394*	%
Ethane(Mole Fraction)	3.6596*	%
Propane(Mole Fraction)	1.4064*	%
I-Butane(Mole Fraction)	1.1023*	%
n-Butane(Mole Fraction)	0.8492*	%
I-Pentane(Mole Fraction)	0.7259*	%
n-Pentane(Mole Fraction)	0.2885*	%
Cyclopentane(Mole Fraction)	0.0383*	%
n-Hexane(Mole Fraction)	0.3713*	%
Cyclohexane(Mole Fraction)	0.057*	%
Heptane(Mole Fraction)	0.0855*	%
Methylcyclohexane(Mole Fraction)	0.0553*	%
2,2,4-Trimethylpentane(Mole Fraction)	0.0061*	%
Benzene(Mole Fraction)	0.0566*	%
Toluene(Mole Fraction)	0.0488*	%
Ethylbenzene(Mole Fraction)	0.0014*	%
m-Xylene(Mole Fraction)	0.0324*	%
Octane(Mole Fraction)	0.0325*	%
Nonane(Mole Fraction)	0.0119*	%
Decane(Mole Fraction)	0.0131*	%

Properties	121-Y	
Mole Fraction Vapor	99.403	%
Temperature	120*	°F
Pressure	1232*	psig
Std Vapor Volumetric Flow	3*	MMSCFD
Composition	121-Y	
H2S(Mole Fraction)	0.4812*	%
Nitrogen(Mole Fraction)	0.8384*	%
CO2(Mole Fraction)	2.7804*	%
Methane(Mole Fraction)	77.957*	%
Ethane(Mole Fraction)	8.0508*	%
Propane(Mole Fraction)	4.3734*	%
I-Butane(Mole Fraction)	1.1326*	%
n-Butane(Mole Fraction)	1.524*	%
I-Pentane(Mole Fraction)	0.7606*	%
n-Pentane(Mole Fraction)	0.5768*	%
Cyclopentane(Mole Fraction)	0.0527*	%
n-Hexane(Mole Fraction)	0.4907*	%
Cyclohexane(Mole Fraction)	0.1119*	%
Heptane(Mole Fraction)	0.1898*	%
Methylcyclohexane(Mole Fraction)	0.0628*	%
2,2,4-Trimethylpentane(Mole Fraction)	0.007*	%
Benzene(Mole Fraction)	0.0519*	%
Toluene(Mole Fraction)	0.0399*	%
Ethylbenzene(Mole Fraction)	0.0025*	%
m-Xylene(Mole Fraction)	0.0189*	%
Octane(Mole Fraction)	0.0467*	%
Nonane(Mole Fraction)	0.0199*	%
Decane(Mole Fraction)	0.0296*	%

ARM ENERGY/SALT CREEK MIDSTREAM
JAL, NEW MEXICO
466 GPM MDEA
35 MMSCFD @1225 PSI @120F
10.00% ↓ 2% CO2 : 19,716 ↓ 4PPM H2S

PRELIMINARY 6/12/2018

Burning all H2S = [Variable Not Set] lb/h SO2

Properties	33	
Temperature	121.87	°F
Pressure	8	psig
Std Vapor Volumetric Flow	3.8167	MMSCFD
Composition	33	
CO2(Mole Fraction)	73.869	%
H2S(Mole Fraction)	18.075	%
Water(Mole Fraction)	7.6556	%
H2S(Mass Flow)	2581.5	lb/h

LAC_FOD 36.066 % | RC_FOD 8.0222 %

Names	Units	GAS COOLER	LEAN AMINE COOLER	REFLUX CONDENSER
Total Energy Demand	MMBTU/h	0.76291	21.88	7.4213
Minimum End Approach Temperature	°F	20	30	22.946
Minimum Effective Approach Temperature	°F	20	30	22.946

Composition	Makeup	
Water(Mass Flow)	577.34	lb/h
Water(Std Liquid Volumetric Flow)	1.1541	sgpm
MDEA(Mass Flow)	0.034157	lb/h
MDEA(Std Liquid Volumetric Flow)	6.5465e-05	sgpm

Names	Units	REFLUX PUMP
Overall Efficiency	%	50*
Power	hp	2.5*
Pressure Change	psi	157.71
Dynamic Head	ft	368.35

Properties	3	
Std Vapor Volumetric Flow (Total)	35	MMSCFD
Composition	3	
H2S(Mole Fraction, Total)	1.9716	%
CO2(Mole Fraction, Total)	10.024	%

Properties	21	
Std Liquid Volumetric Flow	466*	sgpm

Names	Units	HP CIRC PUMP
Overall Efficiency	%	70*
Power	hp	482.12
Pressure Change	psi	1250*

Properties	10	
Temperature	171.58	°F
Pressure	1225	psig
Analysis	10	
CO2 Loading Mole/Mole Amine	0.3309	
H2S Loading Mole/Mole Amine	0.077998	
Total Acid Gas Loading/Mole Amine	0.4089	

CO2_Rich_App_Eq	%
H2S_Rich_App_Eq	%

Properties	71	
Temperature	145.09	°F
Pressure	74	psig
Std Vapor Volumetric Flow	183.55	SCFM
Composition	71	
CO2(Mole Fraction)	40.492	%
H2S(Mole Fraction)	621.61	ppm

Properties	34	
Std Liquid Volumetric Flow	13.437	sgpm
Liquid Volumetric Flow	13.587	gpm

Names	Units	L/R EXCH - A
Heat Duty	MMBTU/h	8.0038
Minimum Effective Approach Temperature	°F	51.666

Names	Units	BOOSTER PUMP
Overall Efficiency	%	66*
Power	hp	25.987
Pressure Change	psi	60*
Dynamic Head	ft	143.04

Properties	17R	
Std Liquid Volumetric Flow	464.85	sgpm
Liquid Volumetric Flow	490.05	gpm
Analysis	17R	
CO2 Loading Mole/Mole Amine	0.0021143	

Properties	9	
Temperature	119.91	°F
Pressure	1209	psig
Std Vapor Volumetric Flow	31.276	MMSCFD
Composition	9	
CO2(Mole Fraction)	1.8614	%
H2S(Volumetric Fraction)	1.034	ppm

Names	Units	REB-Q
Energy Rate	MMBTU/h	30*

REB_FOD 1.7447 %

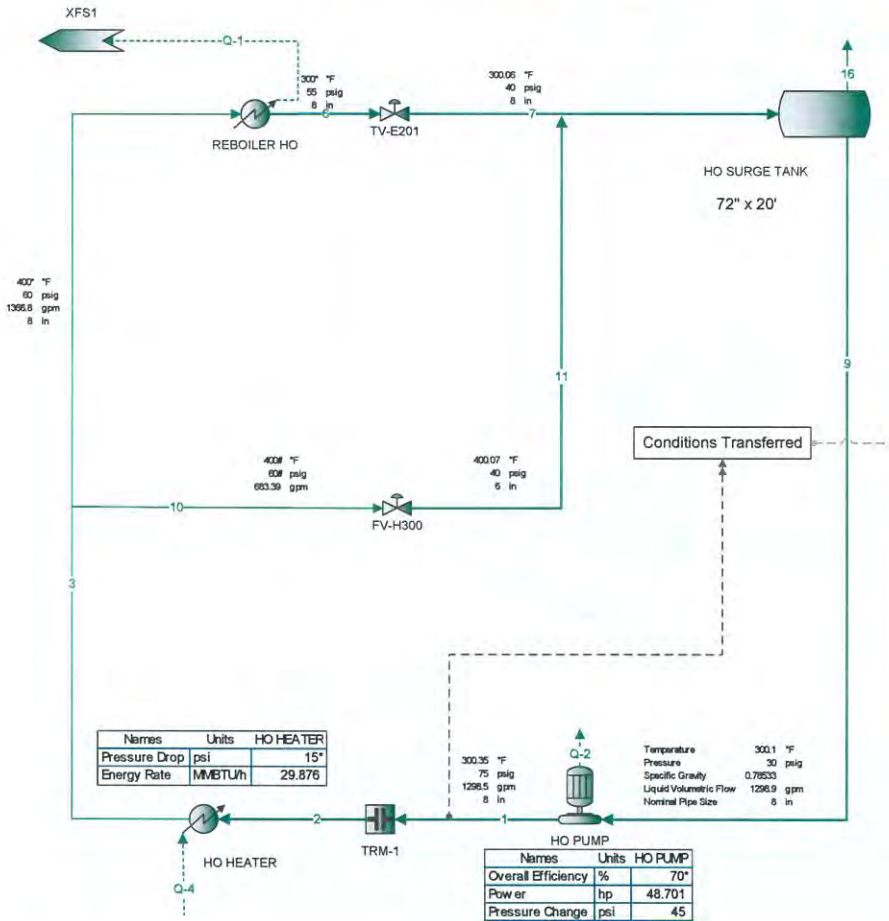
Steam_Rate 1.1269# lb/gal

Names	Units	111-H	121-Y	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	17R	18	19	20	21	22	23	30	31	32	33	34	35	36	40	50	51	60	61	62	70	71	80
Temperature	°F	120	120*	119.51	119.51	119.51	119.41	119.15	136.12	120*	119.91	171.58	172.99	172.71	172.44	202*	183.69	256.15	257.87	257.87	258.04	225.04	225.05	224.75	130*	132.49	267.99	122.95	122	121.87	122	122.54	122.94	257.87	119.91	95.16	119.41		119.15	172.71	145.09	
Pressure	psig	1232*	1232*	1232	1232	1232	1220	1225	1220	1211	1209	1225	75*	74	74	72	13*	17	15	15	75	74	69	69	59	1309	12	10	9	8	9	166.71	12*	15	1209	75*	1230	1230	1225	74	74	74
Mole Fraction Vapor	%	100	99.403	100	100	100	100	100	100	99.891	100	0	0.38177	0	0	0.67539	2.9016	0	0	0	0	0	0	0	0	0	100	52.867	100	100	0	0	0	100	0	20.929	0	0	0	100	100	0
Mass Flow	lb/h	27512.9	7330.48	34843.4	87108.4	87238.8	87238.5	87237.9	70173.7	70173.7	70019.5	249950	249950	249027	254296	254296	254296	268924	237416	237416	237416	237416	237416	237393	237393	237393	23599.1	23598.1	16879.9	16879.9	6719.14	6719.14	6719.14	31598.5	154.214	154.214	0.339267	0	0.541875	1077.8	915.702	0
Std Vapor Volumetric Flow	MMSCFD	11*	3*	14	35	35.066	35.066	35.065	31.312	31.312	31.276	71.491	71.491	71.22	72.747	72.747	72.747	84.677	68.93	68.93	68.93	68.93	68.93	69.222	69.222	69.222	7.2105	7.2105	3.8167	3.8167	3.3938	3.3938	3.3938	15.747	0.035319	0.035319	0.00016934	0	0.00027288	0.30537	0.26431	0
Std Liquid Volumetric Flow	sgpm	137.55	39.756	177.31	443.26	443.52	443.52	443.52	400.59	400.59	400.13	498.94	498.94	495.68	506.07	506.07	506.07	527.96	464.85	464.85	464.85	464.85	464.85	466*	466	466	54.659	54.659	41.222	41.222	13.437	13.437	13.437	63.131	0.45839	0.45839	0.0006472	0	0.0010873	3.7171	3.3268	0
Mass Density	lb/ft^3	5.597	5.6602	5.6186	5.6186	5.6177	5.6091	5.5878	4.6682	4.6693	4.8521	67.181	42.019	67.052	67.013	31.172	4.1615	60.441	60.402	60.402	60.404	61.506	61.505	61.512	64.075	64.142	0.11209	0.2243	0.15411	0.14759	61.654	61.656	61.64	0.071325	41.059	2.8059	61.728		61.732	0.42755	0.43966	
Dynamic Viscosity	cP	0.015239		0.015108	0.015108	0.015115	0.015106	0.015086	0.014346		0.014211	1.9942		1.94	1.9413			0.58719	0.68273	0.68273	0.6829	0.90372	0.90353	0.90242	2.8189	2.7791	0.016437		0.01574	0.015735	0.55628	0.55663	0.55329	0.013576	0.24004		0.57294		0.57435	0.014966	0.014137	
Compressibility		0.8157	0.7879	0.8092	0.8092	0.809	0.8091	0.8093	0.8444	0.8259	0.8268	0.08674	0.01001	0.006267	0.006212	0.01247	0.03069	0.001975	0.002003	0.002003	0.006048	0.006156	0.005809	0.005801	0.005691	0.1017	0.9968	0.5249	0.9922	0.9925	0.00111	0.008491	0.001249	0.9853	0.1906	0.2135	0.65868		0.05847	0.9826	0.9808	
Nominal Pipe Size	in					8	8	8	6	8	6	6	8	6	6	8	12	8*	6	6	6	6	6	6	6	6	16*	12*	12*	1.5	1.5	1.5	1.5	28*	0.375	0.75	0.125				2	2.5	
Pipe Schedule						XS*	XS*	XS*	XS*	XS*	XS*	XS*	STD*	STD*	STD*	STD*	STD*	STD*	STD	STD	STD	STD	STD	STD	STD	XS*	STD	STD	STD	STD	XS*	XS*	XS*	STD	XS*	XS*	STD				XS*	XS*	STD
Corrosion Allowance	in					0.0625*	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*				0.0625*	0.0625*	0.0625*
Maximum Allowable Working Pressure	psig					1801.8	1801.8	1801.8	1960.4	1801.8	1980.4	1960.4	1037.9	1126.7	1126.7	1037.9	847.46	1037.9	1126.7	1126.7	1126.7	1126.7	1126.7	1126.7	1126.7	1980.4	673	847.46	847.46	847.46	2486.2	2486.2	2486.2	382.37	2999.4	2912.7				2257.5	2621	
Mixture Velocity	ft/s					13.603	13.624	13.676	23.068	12.624	22.145	5.7093	4.7563	5.1421	5.254	6.5227	21.612	3.5576	5.4421	5.4421	5.4419	5.3444	5.3445	5.3569	5.1426	5.6938	46.106	37.212	38.739	40.45	2.4668	2.4668	2.4674	30.299	1.0691	5.0843	0.0038341				34.148	19.657	
Total Linear Pressure Drop	psi/(100*ft)					0.25432	0.25471	0.25567	0.84962	0.25365	0.81377	0.91812	0.39589	0.70573	0.73427	0.51118	0.45082	0.20016	0.63656	0.63655	0.63654	0.6417	0.64169	0.64451	0.71839	0.92159	0.029104	0.08219	0.036965	0.039604	0.7941	0.79378	0.79338	0.0043275	0.53124	0.52278	0.0020289				0.6853	0.19232	

sim PMX Tuesday, June 12, 2018

Names	Units	REBOILER HO
Total Energy Supply	MMBTU/h	30
Total Energy Demand	MMBTU/h	30
Highest Supply Temperature	°F	400
Low est Supply Temperature	°F	300
Highest Demand Temperature	°F	258.92
Low est Demand Temperature	°F	256.15
Log Mean Temperature Difference	°F	83.576
End Point UA	Btu/(h*°F)	3.5896e+05
Minimum End Approach Temperature	°F	43.854
Effective Mean Temperature Difference	°F	82.16
Effective UA	Btu/(h*°F)	3.6514e+05
Minimum Effective Approach Temperature	°F	43.779

HOT OIL SYSTEM

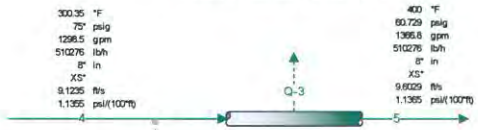


Names	Units	HO HEATER
Pressure Drop	psi	15*
Energy Rate	MMBTU/h	29.876

Names	Units	HO PUMP
Overall Efficiency	%	70*
Pow er	hp	48.701
Pressure Change	psi	45
Dynamic Head	ft	132.28

EXISTING HOT OIL HEATER

COIL DIA TOO SMALL?
TOO MUCH DELTA P?
TOO FAST OF VELOCITY?



1260 FEET OF 8"
2.25 FT^2/FT = 2850 FT^2
2850 * 10,526 FLUX = 30 MMBTU/H

Names	Units	PIPE COIL
Pipe Length	ft	1260
Pressure Drop	psi	14.271
Outlet Pressure	psig	60.729
Change in Temperature	°F	99.854
Outlet Temperature	°F	400
Total Heat Transfer	MMBTU/h	29.877

MASS FLUX RATE = 408 LB/SEC-FT^2 (250-450 VALID RANGE)

Names	Units	1	2	6	7	9	11
Temperature	°F	300.346	300.346	300*	300.063	300.105	400.07
Pressure	psig	75	75*	55	40	30	40
Molecular Weight	lb/lbmol	320	320	320	320	320	320
Mass Density	lb/ft^3	48.9932	48.9932	48.9931	48.9853	48.9801	46.5349
Specific Gravity		0.785537	0.785537	0.785536	0.785411	0.785328	0.746122
Dynamic Viscosity	cP	1.3072	1.3072	1.3084	1.3063	1.3049	0.73698
Compressibility		0.071829	0.071829	0.055839	0.043824	0.035814	0.040766
CpCv Ratio		1.0301	1.0301	1.0302	1.0303	1.0303	1.0349
Critical Temperature	°F	953.6	953.6	953.6	953.6	953.6	953.6
Critical Pressure	psig	176.3	176.3	176.3	176.3	176.3	176.3
True Vapor Pressure	psig	-14.696	-14.696	-14.696	-14.696	-14.696	-14.696
Molar Flow	lbmol/h	1594.6	1594.6	1594.6	1594.6	1594.6	797.31
Mass Flow	lb/h	510276	510276	510276	510276	510276	255138
Std Liquid Volumetric Flow	sgpm	1165.19	1165.19	1165.19	1165.19	1165.19	582.593
Liquid Volumetric Flow	gpm	1298.52	1298.52	1298.53	1298.73	1298.87	683.56
Total Linear Pressure Drop	psi/(100*ft)	0.903816	0.903816	0.903904	0.903895	0.903886	0.954566
Mixture Velocity	ft/s	8.32769	8.32769	8.3277	8.32903	8.32991	7.5911
Nominal Pipe Size	in	8	8	8	8	8	6
Pipe Schedule		STD	STD	STD	STD	STD	STD
Corrosion Allow ance	in	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*	0.0625*
Maximum Allow able Working Pressure	psig	1037.9	1037.9	1037.92	1037.92	1037.91	1121.05

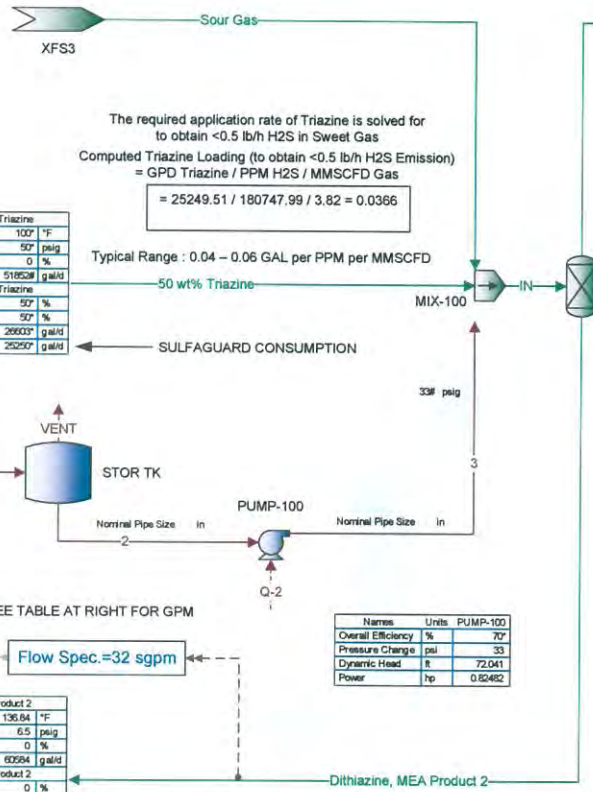
SULFAGUARD
4.11 MMSCFD 16.75% H2S

Properties	Sour Gas	
Temperature	121.87	°F
Pressure	8	psig
Mole Fraction Vapor	100	%
Std Vapor Volumetric Flow	3.8167	MMSCFD
Composition	Sour Gas	
H2S(Mass Flow)	2581.5	lb/h
H2S(Mole Fraction)	18.075	%
H2S(Mole Fraction)	1.8075e+05	ppm

Properties	Sweet Gas	
Temperature	136.84	°F
Pressure	6.5	psig
Mole Fraction Vapor	100	%
Std Vapor Volumetric Flow	3.2407	MMSCFD
Gross Ideal Gas Heating Value	20.294	Btu/ft^3
Composition	Sweet Gas	
H2S(Mass Flow)	0	lb/h
H2S(Mole Fraction)	0	ppm
H2S(Mole Fraction)	0	%
Water(Mole Fraction)	12.795	%
CO2(Mole Fraction)	86.677	%
Methane(Mole Fraction)	0.17552	%

Properties	Sweet Gas	
Temperature	136.84	°F
Pressure	6.5	psig
Mole Fraction Vapor	100	%
Mass Flow	14499	lb/h
Composition	Sweet Gas	
H2S(Mass Flow)	0	lb/h
Nitrogen(Mass Flow)	0.0089417	lb/h
CO2(Mass Flow)	13573	lb/h
Methane(Mass Flow)	10.019	lb/h
Ethane(Mass Flow)	2.3842	lb/h
Propane(Mass Flow)	1.0978	lb/h
i-Butane(Mass Flow)	0.62298	lb/h
n-Butane(Mass Flow)	1.0613	lb/h
i-Pentane(Mass Flow)	0.37541	lb/h
n-Pentane(Mass Flow)	0.29961	lb/h
Cyclopentane(Mass Flow)	0.20466	lb/h
n-Hexane(Mass Flow)	0.69278	lb/h
Benzene(Mass Flow)	26.47	lb/h
Cyclohexane(Mass Flow)	0.95948	lb/h
2,2,4-Trimethylpentane(Mass Flow)	0.017262	lb/h
Heptane(Mass Flow)	0.19454	lb/h
Methylcyclohexane(Mass Flow)	0.5735	lb/h
Toluene(Mass Flow)	23.884	lb/h
Octane(Mass Flow)	0.19537	lb/h
Ethylbenzene(Mass Flow)	0.68094	lb/h
m-Xylene(Mass Flow)	15.654	lb/h
Nonane(Mass Flow)	0.040156	lb/h
Decane(Mass Flow)	0.048007	lb/h
Water(Mass Flow)	820.2	lb/h

Properties	Sweet Gas	
Temperature	136.84	°F
Pressure	6.5	psig
Mole Fraction Vapor	100	%
Mass Flow	63506	ton/yr
Composition	Sweet Gas	
H2S(Mass Flow)	0	ton/y
Nitrogen(Mass Flow)	0.039165	ton/y
CO2(Mass Flow)	59452	ton/y
Methane(Mass Flow)	43.885	ton/y
Ethane(Mass Flow)	10.443	ton/y
Propane(Mass Flow)	4.8086	ton/y
i-Butane(Mass Flow)	2.7286	ton/y
n-Butane(Mass Flow)	4.6483	ton/y
i-Pentane(Mass Flow)	1.6443	ton/y
n-Pentane(Mass Flow)	1.3123	ton/y
Cyclopentane(Mass Flow)	0.89641	ton/y
n-Hexane(Mass Flow)	2.903	ton/y
Benzene(Mass Flow)	115.94	ton/y
Cyclohexane(Mass Flow)	4.2025	ton/y
2,2,4-Trimethylpentane(Mass Flow)	0.075609	ton/y
Heptane(Mass Flow)	0.85209	ton/y
Methylcyclohexane(Mass Flow)	2.5119	ton/y
Toluene(Mass Flow)	104.61	ton/y
Octane(Mass Flow)	0.85574	ton/y
Ethylbenzene(Mass Flow)	2.9825	ton/y
m-Xylene(Mass Flow)	68.564	ton/y
Nonane(Mass Flow)	0.17588	ton/y
Decane(Mass Flow)	0.21027	ton/y
Water(Mass Flow)	3592.5	ton/y



Properties	50 wt% Triazine	
Temperature	100*	°F
Pressure	50*	psig
Mole Fraction Vapor	0	%
Std Liquid Volumetric Flow	51852#	gal/d
Composition	50 wt% Triazine	
Water(Mass Fraction)	50*	%
MEA Triazine(Mass Fraction)	50*	%
Water(Std Liquid Volumetric Flow)	26603*	gal/d
MEA Triazine(Std Liquid Volumetric Flow)	25250*	gal/d

Names	Units	PUMP-100
Overall Efficiency	%	70*
Pressure Change	psi	33
Dynamic Head	ft	72.041
Power	hp	0.82482

Properties	Dithiazine, MEA Product 2	
Temperature	136.84	°F
Pressure	6.5	psig
Mole Fraction Vapor	0	%
Std Liquid Volumetric Flow	60584	gal/d
Composition	Dithiazine, MEA Product 2	
H2S(Mass Fraction)	0	%
H2S(Mole Fraction)	0	ppm
Water(Mass Fraction)	43.133	%
MEA Triazine(Mass Fraction)	4.489	%
MEA Dithiazine(Mass Fraction)	30.002	%
MEA(Mass Fraction)	22.081	%

SOUDERS BROWN EQUATION

$V = K\ [\ (Dl - Dg) / Dg\ ]^{1/2}$

TYPICAL K FACTORS FOR TOWER SIZING

(BASED ON TEG TOWERS)

STRUCTURED PACKING : K = 0.3 – 0.4

RANDOM 1" PALL RINGS : K = 0.13 – 0.18

RANDOM 2" PALL RINGS : K = 0.19 – 0.26

K	Dl	Dg	V(FPS)	DIA(FT)	GPM*
0.10	66.65	0.15	2.09	4.31	29.22
0.15	66.65	0.15	3.14	3.52	19.48
0.20	66.65	0.15	4.19	3.05	14.61
0.25	66.65	0.15	5.24	2.73	11.69
0.30	66.65	0.15	6.28	2.49	9.74
0.35	66.65	0.15	7.33	2.31	8.35
0.40	66.65	0.15	8.38	2.16	7.3
0.45	66.65	0.15	9.42	2.03	6.49
0.50	66.65	0.15	10.47	1.93	5.84

*PUMPING RATE GPM @ 2 GPM/FT^2 TOWER AREA

H2S Scavenging with Triazine (Sulfaguard)

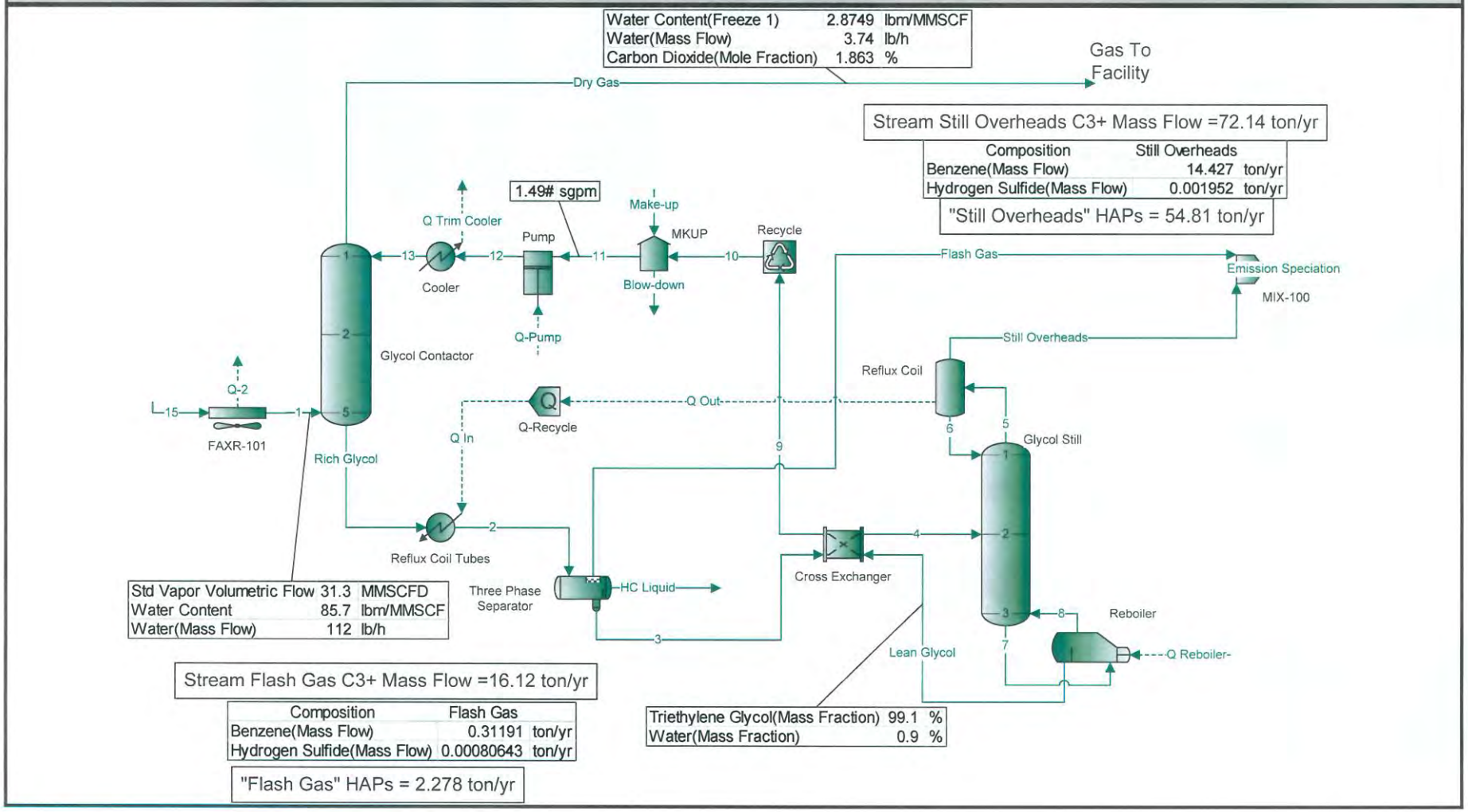
Reaction Set Triazine: $C_9H_{21}N_3O_3 + 2\ H_2S \rightarrow C_5H_{11}NOS_2 + 2\ C_2H_7NO$

Triazine + 2H2S -> Dithiazine + 2MEA

Note: Triazine concentration not given in original reference, representative values used.
Dillon (1991), "Gas Sweetening With a Novel and Selective Alkanolamine,"
Proceedings of the 70th GPA Annual Convention

Dehydration_x3
Plant Schematic

Client Name:	SCM	Job:
Location:		
Flowsheet:	Dehydration_x3	



* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	SCM	Job:	
Location:			
Flowsheet:	Dehydration_x3		

Connections

	Blow-down	Dry Gas	Emission Speciation	Flash Gas	HC Liquid
From Block	MKUP	Glycol Contactor	MIX-100	Three Phase Separator	Three Phase Separator
To Block	--	--	--	MIX-100	--

Stream Composition

Mole Fraction	Blow-down %	Dry Gas %	Emission Speciation %	Flash Gas %	HC Liquid %
Nitrogen	0	0.540573	0.00812785	0.133482	
Carbon Dioxide	7.91649E-09	1.86335	0.850444	9.38865	
Hydrogen Sulfide	2.83656E-10	0.000148948	0.000279937	0.00136054	
Methane	5.86368E-11	85.6105	4.14395	65.7223	
Ethane	3.36724E-10	5.1249	0.59789	8.5145	
Propane	1.37901E-09	2.27735	0.379024	4.77684	
i-Butane	1.2367E-09	1.23691	0.192399	2.30598	
n-Butane	5.39411E-09	1.2023	0.26473	2.78617	
2,2-Dimethylpropane	0	0	0	0	
i-Pentane	1.90701E-08	0.817084	0.22143	1.83724	
n-Pentane	1.57523E-08	0.389685	0.121542	0.948866	
2,2-Dimethylbutane	0	0	0	0	
Cyclopentane	3.91134E-07	0.0456118	0.0758908	0.199806	
2,3-Dimethylbutane	0	0	0	0	
2-Methylpentane	0	0	0	0	
3-Methylpentane	0	0	0	0	
n-Hexane	9.18611E-08	0.438853	0.1925	1.04476	
Methylcyclopentane	0	0	0	0	
Benzene	0.000179355	0.0482382	0.652597	0.229601	
Cyclohexane	1.20517E-06	0.075155	0.117754	0.249883	
2-Methylhexane	0	0	0	0	
3-Methylhexane	0	0	0	0	
2,2,4-Trimethylpentane	7.9739E-09	0.00688493	0.00431853	0.0146245	
n-Heptane	1.41216E-07	0.117985	0.073775	0.245406	
Methylcyclohexane	1.50367E-06	0.0618093	0.0985557	0.169788	
Toluene	0.000664897	0.0409773	0.778998	0.151068	
n-Octane	1.67123E-07	0.0379778	0.0286853	0.0644806	
Ethylbenzene	5.30429E-05	0.00150484	0.0301967	0.00391048	
m-Xylene	0.00102432	0.0262651	0.512574	0.0656188	
p-Xylene	0	0	0	0	
o-Xylene	0	0	0	0	
n-Nonane	1.9594E-07	0.0139006	0.0135706	0.0182187	
n-Decane	7.49522E-07	0.0158978	0.0170161	0.0143661	
Undecane	0	0	0	0	
Dodecane	0	0	0	0	
Tridecane	0	0	0	0	
Tetradecane	0	0	0	0	
Pentadecane	0	0	0	0	
Hexadecane	0	0	0	0	
Heptadecane	0	0	0	0	
Octadecane	0	0	0	0	
Nonadecane	0	0	0	0	
Eicosane	0	0	0	0	
Heneicosane	0	0	0	0	
Docosane	0	0	0	0	
Tricosane	0	0	0	0	
Tetracosane	0	0	0	0	
Pentacosane	0	0	0	0	
Hexacosane	0	0	0	0	
Heptacosane	0	0	0	0	
Octacosane	0	0	0	0	
Nonacosane	0	0	0	0	

* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	SCM	Job:	
Location:			
Flowsheet:	Dehydration_x3		

Stream Composition

Mole Fraction	Blow-down %	Dry Gas %	Emission Speciation %	Flash Gas %	HC Liquid %
Triacontane	0	0	0	0	
Water	7.03392	0.00605557	90.6235	1.11295	
Oxygen	0	0	0	0	
Sulfur Dioxide	0	0	0	0	
DGA	0	0	0	0	
MDEA	0.0229612	2.27909E-07	0.000220967	1.37533E-06	
Piperazine	0	0	0	0	
Triethylene Glycol	92.9412	6.51571E-05	7.02814E-05	0.000115839	

Molar Flow	Blow-down lbmol/h	Dry Gas lbmol/h	Emission Speciation lbmol/h	Flash Gas lbmol/h	HC Liquid lbmol/h
Nitrogen	0	18.5273	0.000536528	0.000530019	0
Carbon Dioxide	0	63.8632	0.0561387	0.0372797	0
Hydrogen Sulfide	0	0.00510496	1.84789E-05	5.40231E-06	0
Methane	0	2934.16	0.273546	0.260965	0
Ethane	0	175.648	0.0394673	0.0338087	0
Propane	0	78.0524	0.0250198	0.0189675	0
i-Butane	0	42.393	0.0127005	0.00915642	0
n-Butane	0	41.207	0.0174751	0.0110631	0
2,2-Dimethylpropane	0	0	0	0	0
i-Pentane	0	28.0043	0.0146168	0.00729518	0
n-Pentane	0	13.3558	0.00802308	0.00376768	0
2,2-Dimethylbutane	0	0	0	0	0
Cyclopentane	0	1.56327	0.00500963	0.000793373	0
2,3-Dimethylbutane	0	0	0	0	0
2-Methylpentane	0	0	0	0	0
3-Methylpentane	0	0	0	0	0
n-Hexane	0	15.041	0.0127071	0.00414843	0
Methylcyclopentane	0	0	0	0	0
Benzene	0	1.65329	0.0430786	0.000911683	0
Cyclohexane	0	2.57582	0.00777307	0.000992218	0
2-Methylhexane	0	0	0	0	0
3-Methylhexane	0	0	0	0	0
2,2,4-Trimethylpentane	0	0.23597	0.000285071	5.80699E-05	0
n-Heptane	0	4.04374	0.00486996	0.000974438	0
Methylcyclohexane	0	2.11842	0.00650576	0.000674179	0
Toluene	0	1.40443	0.0514225	0.000599848	0
n-Octane	0	1.30163	0.00189355	0.000256034	0
Ethylbenzene	0	0.0515761	0.00199331	1.55274E-05	0
m-Xylene	0	0.900196	0.0338355	0.000260554	0
p-Xylene	0	0	0	0	0
o-Xylene	0	0	0	0	0
n-Nonane	0	0.476422	0.000895808	7.23413E-05	0
n-Decane	0	0.544873	0.00112325	5.70436E-05	0
Undecane	0	0	0	0	0
Dodecane	0	0	0	0	0
Tridecane	0	0	0	0	0
Tetradecane	0	0	0	0	0
Pentadecane	0	0	0	0	0
Hexadecane	0	0	0	0	0
Heptadecane	0	0	0	0	0
Octadecane	0	0	0	0	0
Nonadecane	0	0	0	0	0
Eicosane	0	0	0	0	0
Heneicosane	0	0	0	0	0
Docosane	0	0	0	0	0
Tricosane	0	0	0	0	0

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	SCM	Job:	
Location:			
Flowsheet:	Dehydration_x3		

Molar Flow	Blow-down lbmol/h	Dry Gas lbmol/h	Emission Speciation lbmol/h	Flash Gas lbmol/h	HC Liquid lbmol/h
Tetracosane	0	0	0	0	0
Pentacosane	0	0	0	0	0
Hexacosane	0	0	0	0	0
Heptacosane	0	0	0	0	0
Octacosane	0	0	0	0	0
Nonacosane	0	0	0	0	0
Triacontane	0	0	0	0	0
Water	0	0.207545	5.98215	0.0044192	0
Oxygen	0	0	0	0	0
Sulfur Dioxide	0	0	0	0	0
DGA	0	0	0	0	0
MDEA	0	7.81123E-06	1.45862E-05	5.46105E-09	0
Piperazine	0	0	0	0	0
Triethylene Glycol	0	0.00223316	4.63935E-06	4.59965E-07	0

Mass Fraction	Blow-down %	Dry Gas %	Emission Speciation %	Flash Gas %	HC Liquid %
Nitrogen	0	0.742707	0.0110529	0.139837	
Carbon Dioxide	2.47323E-09	4.02196	1.81688	15.452	
Hydrogen Sulfide	6.86258E-11	0.000248968	0.000463133	0.00173403	
Methane	6.67768E-12	67.359	3.22716	39.4293	
Ethane	7.18751E-11	7.55792	0.872721	9.57445	
Propane	4.31667E-10	4.92518	0.81133	7.87719	
i-Butane	5.1026E-10	3.52595	0.542851	5.01226	
n-Butane	2.2256E-09	3.42731	0.746931	6.05598	
2,2-Dimethylpropane	0	0	0	0	
i-Pentane	9.76711E-09	2.8913	0.775532	4.95714	
n-Pentane	8.06785E-09	1.37892	0.425685	2.56017	
2,2-Dimethylbutane	0	0	0	0	
Cyclopentane	1.9473E-07	0.15689	0.258372	0.524041	
2,3-Dimethylbutane	0	0	0	0	
2-Methylpentane	0	0	0	0	
3-Methylpentane	0	0	0	0	
n-Hexane	5.61952E-08	1.85481	0.805283	3.36692	
Methylcyclopentane	0	0	0	0	
Benzene	9.94521E-05	0.184801	2.47455	0.670697	
Cyclohexane	7.20005E-07	0.310212	0.481077	0.786458	
2-Methylhexane	0	0	0	0	
3-Methylhexane	0	0	0	0	
2,2,4-Trimethylpentane	6.46591E-09	0.0385719	0.0239467	0.0624728	
n-Heptane	1.00449E-07	0.579829	0.358856	0.919594	
Methylcyclohexane	1.04806E-06	0.297647	0.46975	0.623435	
Toluene	0.000434891	0.185174	3.48427	0.520532	
n-Octane	1.35517E-07	0.212766	0.159063	0.275447	
Ethylbenzene	3.99754E-05	0.00783556	0.155624	0.0155255	
m-Xylene	0.000771972	0.13676	2.64163	0.260522	
p-Xylene	0	0	0	0	
o-Xylene	0	0	0	0	
n-Nonane	1.78395E-07	0.0874392	0.0844905	0.087383	
n-Decane	7.57039E-07	0.110939	0.117528	0.0764402	
Undecane	0	0	0	0	
Dodecane	0	0	0	0	
Tridecane	0	0	0	0	
Tetradecane	0	0	0	0	
Pentadecane	0	0	0	0	
Hexadecane	0	0	0	0	
Heptadecane	0	0	0	0	
Octadecane	0	0	0	0	
Nonadecane	0	0	0	0	

* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	SCM	Job:	
Location:			
Flowsheet:	Dehydration_x3		

Mass Fraction	Blow-down %	Dry Gas %	Emission Speciation %	Flash Gas %	HC Liquid %
Eicosane	0	0	0	0	
Heneicosane	0	0	0	0	
Docosane	0	0	0	0	
Tricosane	0	0	0	0	
Tetracosane	0	0	0	0	
Pentacosane	0	0	0	0	
Hexacosane	0	0	0	0	
Heptacosane	0	0	0	0	
Octacosane	0	0	0	0	
Nonacosane	0	0	0	0	
Triacontane	0	0	0	0	
Water	0.899545	0.00535049	79.2532	0.749808	
Oxygen	0	0	0	0	
Sulfur Dioxide	0	0	0	0	
DGA	0	0	0	0	
MDEA	0.0194231	1.33198E-06	0.0012782	6.12887E-06	
Piperazine	0	0	0	0	
Triethylene Glycol	99.0797	0.0004799	0.000512351	0.000650552	

Mass Flow	Blow-down lb/h	Dry Gas lb/h	Emission Speciation lb/h	Flash Gas lb/h	HC Liquid lb/h
Nitrogen	0	519.012	0.01503	0.0148476	0
Carbon Dioxide	0	2810.59	2.47064	1.64066	0
Hydrogen Sulfide	0	0.173981	0.000629777	0.000184116	0
Methane	0	47071.2	4.38836	4.18652	0
Ethane	0	5281.56	1.18674	1.0166	0
Propane	0	3441.77	1.10326	0.836383	0
i-Butane	0	2463.98	0.738179	0.532191	0
n-Butane	0	2395.04	1.01569	0.643012	0
2,2-Dimethylpropane	0	0	0	0	0
i-Pentane	0	2020.47	1.05458	0.526338	0
n-Pentane	0	963.607	0.578856	0.271834	0
2,2-Dimethylbutane	0	0	0	0	0
Cyclopentane	0	109.637	0.35134	0.0556416	0
2,3-Dimethylbutane	0	0	0	0	0
2-Methylpentane	0	0	0	0	0
3-Methylpentane	0	0	0	0	0
n-Hexane	0	1296.16	1.09504	0.357493	0
Methylcyclopentane	0	0	0	0	0
Benzene	0	129.141	3.36495	0.0712132	0
Cyclohexane	0	216.78	0.654178	0.0835045	0
2-Methylhexane	0	0	0	0	0
3-Methylhexane	0	0	0	0	0
2,2,4-Trimethylpentane	0	26.9545	0.0325632	0.00663323	0
n-Heptane	0	405.191	0.48798	0.0976405	0
Methylcyclohexane	0	207.999	0.638775	0.066195	0
Toluene	0	129.402	4.73799	0.0552691	0
n-Octane	0	148.683	0.216297	0.0292464	0
Ethylbenzene	0	5.47558	0.21162	0.00164847	0
m-Xylene	0	95.5693	3.59215	0.0276617	0
p-Xylene	0	0	0	0	0
o-Xylene	0	0	0	0	0
n-Nonane	0	61.1035	0.114892	0.00927815	0
n-Decane	0	77.5254	0.159818	0.00811626	0
Undecane	0	0	0	0	0
Dodecane	0	0	0	0	0
Tridecane	0	0	0	0	0
Tetradecane	0	0	0	0	0
Pentadecane	0	0	0	0	0

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	SCM	Job:	
Location:			
Flowsheet:	Dehydration_x3		

Mass Flow	Blow-down lb/h	Dry Gas lb/h	Emission Speciation lb/h	Flash Gas lb/h	HC Liquid lb/h
Hexadecane	0	0	0	0	0
Heptadecane	0	0	0	0	0
Octadecane	0	0	0	0	0
Nonadecane	0	0	0	0	0
Eicosane	0	0	0	0	0
Heneicosane	0	0	0	0	0
Docosane	0	0	0	0	0
Tricosane	0	0	0	0	0
Tetracosane	0	0	0	0	0
Pentacosane	0	0	0	0	0
Hexacosane	0	0	0	0	0
Heptacosane	0	0	0	0	0
Octacosane	0	0	0	0	0
Nonacosane	0	0	0	0	0
Triacontane	0	0	0	0	0
Water	0	3.73898	107.77	0.0796131	0
Oxygen	0	0	0	0	0
Sulfur Dioxide	0	0	0	0	0
DGA	0	0	0	0	0
MDEA	0	0.000930803	0.00173813	6.5075E-07	0
Piperazine	0	0	0	0	0
Triethylene Glycol	0	0.33536	0.000696705	6.90743E-05	0

Stream Properties

Property	Units	Blow-down	Dry Gas	Emission Speciation	Flash Gas	HC Liquid
Temperature	°F		105.321	207.377	117.777	
Pressure	psig	-0.1	1218.7	0.1	50 *	50
Mole Fraction Vapor	%		100	99.7516	100	0
Mole Fraction Light Liquid	%		0	0.248369	0	
Mole Fraction Heavy Liquid	%		0	0	0	
Molecular Weight	lb/lbmol	140.869	20.3893	20.5999	26.7402	
Mass Density	lb/ft^3		5.1424	0.0430332	0.284236	
Molar Flow	lbmol/h	0	3427.34	6.6011	0.397072	0
Mass Flow	lb/h	0	69881.1	135.982	10.6178	0
Vapor Volumetric Flow	ft^3/h		13589.2	3159.93	37.3555	
Liquid Volumetric Flow	gpm		1694.24	393.966	4.65731	
Std Vapor Volumetric Flow	MMSCFD	0	31.2149	0.0601203	0.00361638	0
Std Liquid Volumetric Flow	sgpm	0	399.801	0.310742	0.050153	0
Compressibility			0.806555	0.989429	0.982171	
Specific Gravity			0.703988		0.923267	
API Gravity						
Enthalpy	Btu/h	0	-1.26277E+08	-638472	-19396.3	0
Mass Enthalpy	Btu/lb	-2208.33	-1807.02	-4695.27	-1826.77	
Mass Cp	Btu/(lb*°F)		0.673551	0.449184	0.442343	
Ideal Gas CpCv Ratio			1.24817	1.27648	1.20562	
Dynamic Viscosity	cP		0.014179		0.0114957	
Kinematic Viscosity	cSt		0.17213		2.52484	
Thermal Conductivity	Btu/(h*ft*°F)		0.0243509		0.0175005	
Surface Tension	lbf/ft					
Net Ideal Gas Heating Value	Btu/ft^3	3505.74	1074.82	194.859	1211.52	
Net Liquid Heating Value	Btu/lb	9172.9	19957.7	2721.52	17104	
Gross Ideal Gas Heating Value	Btu/ft^3	3836.34	1186.19	254.569	1329.73	
Gross Liquid Heating Value	Btu/lb	10063.5	22030.6	3821.45	18781.6	

Remarks

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	SCM	Job:	
Location:			
Flowsheet:	Dehydration_x3		

Connections

	12	13	15		
From Block	Pump	Cooler	--		
To Block	Cooler	Glycol Contactor	FAXR-101		

Stream Composition

Mole Fraction	12 %	13 %	15 %		
Nitrogen	0	0	0.53955 *		
Carbon Dioxide	0	0	1.8614 *		
Hydrogen Sulfide	0	0	0.0001492 *		
Methane	0	0	85.454 *		
Ethane	0	0	5.1162 *		
Propane	0	0	2.2737 *		
i-Butane	0	0	1.2349 *		
n-Butane	0	0	1.2005 *		
2,2-Dimethylpropane	0	0	0 *		
i-Pentane	0	0	0.81594 *		
n-Pentane	0	0	0.38917 *		
2,2-Dimethylbutane	0	0	0 *		
Cyclopentane	0	0	0.04567 *		
2,3-Dimethylbutane	0	0	0 *		
2-Methylpentane	0	0	0 *		
3-Methylpentane	0	0	0 *		
n-Hexane	0	0	0.43838 *		
Methylcyclopentane	0	0	0 *		
Benzene	0.000179285	0.000179285	0.0494 *		
Cyclohexane	0	0	0.075237 *		
2-Methylhexane	0	0	0 *		
3-Methylhexane	0	0	0 *		
2,2,4-Trimethylpentane	0	0	0.00688 *		
n-Heptane	0	0	0.1179 *		
Methylcyclohexane	0	0	0.06188 *		
Toluene	0.000664641	0.000664641	0.042396 *		
n-Octane	0	0	0.03796 *		
Ethylbenzene	5.30224E-05	5.30224E-05	0.00156 *		
m-Xylene	0.00102392	0.00102392	0.0272 *		
p-Xylene	0	0	0 *		
o-Xylene	0	0	0 *		
n-Nonane	0	0	0.0139 *		
n-Decane	0	0	0.0159 *		
Undecane	0	0	0 *		
Dodecane	0	0	0 *		
Tridecane	0	0	0 *		
Tetradecane	0	0	0 *		
Pentadecane	0	0	0 *		
Hexadecane	0	0	0 *		
Heptadecane	0	0	0 *		
Octadecane	0	0	0 *		
Nonadecane	0	0	0 *		
Eicosane	0	0	0 *		
Heneicosane	0	0	0 *		
Docosane	0	0	0 *		
Tricosane	0	0	0 *		
Tetracosane	0	0	0 *		
Pentacosane	0	0	0 *		
Hexacosane	0	0	0 *		
Heptacosane	0	0	0 *		
Octacosane	0	0	0 *		
Nonacosane	0	0	0 *		
Triacontane	0	0	0 *		

* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	SCM	Job:	
Location:			
Flowsheet:	Dehydration_x3		

Stream Composition

Mole Fraction	12 %	13 %	15 %		
Water	7.03152	7.03152	0.18025	*	
Oxygen	0	0	0	*	
Sulfur Dioxide	0	0	0	*	
DGA	0	0	0	*	
MDEA	0.0229524	0.0229524	0	*	
Piperazine	0	0	0	*	
Triethylene Glycol	92.9436	92.9436	0	*	

Molar Flow	12 lbmol/h	13 lbmol/h	15 lbmol/h		
Nitrogen	0	0	18.5278	*	
Carbon Dioxide	0	0	63.9193	*	
Hydrogen Sulfide	0	0	0.00512344	*	
Methane	0	0	2934.44	*	
Ethane	0	0	175.687	*	
Propane	0	0	78.0775	*	
i-Butane	0	0	42.4057	*	
n-Butane	0	0	41.2244	*	
2,2-Dimethylpropane	0	0	0	*	
i-Pentane	0	0	28.0189	*	
n-Pentane	0	0	13.3639	*	
2,2-Dimethylbutane	0	0	0	*	
Cyclopentane	0	0	1.56828	*	
2,3-Dimethylbutane	0	0	0	*	
2-Methylpentane	0	0	0	*	
3-Methylpentane	0	0	0	*	
n-Hexane	0	0	15.0537	*	
Methylcyclopentane	0	0	0	*	
Benzene	1.06794E-05	1.06794E-05	1.69637	*	
Cyclohexane	0	0	2.58359	*	
2-Methylhexane	0	0	0	*	
3-Methylhexane	0	0	0	*	
2,2,4-Trimethylpentane	0	0	0.236255	*	
n-Heptane	0	0	4.04861	*	
Methylcyclohexane	0	0	2.12492	*	
Toluene	3.95903E-05	3.95903E-05	1.45585	*	
n-Octane	0	0	1.30352	*	
Ethylbenzene	3.15836E-06	3.15836E-06	0.0535694	*	
m-Xylene	6.09916E-05	6.09916E-05	0.934031	*	
p-Xylene	0	0	0	*	
o-Xylene	0	0	0	*	
n-Nonane	0	0	0.477318	*	
n-Decane	0	0	0.545996	*	
Undecane	0	0	0	*	
Dodecane	0	0	0	*	
Tridecane	0	0	0	*	
Tetradecane	0	0	0	*	
Pentadecane	0	0	0	*	
Hexadecane	0	0	0	*	
Heptadecane	0	0	0	*	
Octadecane	0	0	0	*	
Nonadecane	0	0	0	*	
Eicosane	0	0	0	*	
Heneicosane	0	0	0	*	
Docosane	0	0	0	*	
Tricosane	0	0	0	*	
Tetracosane	0	0	0	*	
Pentacosane	0	0	0	*	
Hexacosane	0	0	0	*	

* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	SCM	Job:	
Location:			
Flowsheet:	Dehydration_x3		

Molar Flow	12 lbmol/h	13 lbmol/h	15 lbmol/h		
Heptacosane	0	0	0	*	
Octacosane	0	0	0	*	
Nonacosane	0	0	0	*	
Triacontane	0	0	0	*	
Water	0.418843	0.418843	6.18967	*	
Oxygen	0	0	0	*	
Sulfur Dioxide	0	0	0	*	
DGA	0	0	0	*	
MDEA	0.00136719	0.00136719	0	*	
Piperazine	0	0	0	*	
Triethylene Glycol	5.53632	5.53632	0	*	

Mass Fraction	12 %	13 %	15 %		
Nitrogen	0	0	0.74129	*	
Carbon Dioxide	0	0	4.01769	*	
Hydrogen Sulfide	0	0	0.000249385	*	
Methane	0	0	67.2348	*	
Ethane	0	0	7.54497	*	
Propane	0	0	4.91721	*	
i-Butane	0	0	3.52018	*	
n-Butane	0	0	3.42212	*	
2,2-Dimethylpropane	0	0	0	*	
i-Pentane	0	0	2.88721	*	
n-Pentane	0	0	1.37708	*	
2,2-Dimethylbutane	0	0	0	*	
Cyclopentane	0	0	0.157088	*	
2,3-Dimethylbutane	0	0	0	*	
2-Methylpentane	0	0	0	*	
3-Methylpentane	0	0	0	*	
n-Hexane	0	0	1.85278	*	
Methylcyclopentane	0	0	0	*	
Benzene	9.94115E-05	9.94115E-05	0.189249	*	
Cyclohexane	0	0	0.310545	*	
2-Methylhexane	0	0	0	*	
3-Methylhexane	0	0	0	*	
2,2,4-Trimethylpentane	0	0	0.0385437	*	
n-Heptane	0	0	0.579403	*	
Methylcyclohexane	0	0	0.297982	*	
Toluene	0.000434713	0.000434713	0.191583	*	
n-Octane	0	0	0.212663	*	
Ethylbenzene	3.99591E-05	3.99591E-05	0.00812263	*	
m-Xylene	0.000771657	0.000771657	0.141625	*	
p-Xylene	0	0	0	*	
o-Xylene	0	0	0	*	
n-Nonane	0	0	0.0874339	*	
n-Decane	0	0	0.110952	*	
Undecane	0	0	0	*	
Dodecane	0	0	0	*	
Tridecane	0	0	0	*	
Tetradecane	0	0	0	*	
Pentadecane	0	0	0	*	
Hexadecane	0	0	0	*	
Heptadecane	0	0	0	*	
Octadecane	0	0	0	*	
Nonadecane	0	0	0	*	
Eicosane	0	0	0	*	
Heneicosane	0	0	0	*	
Docosane	0	0	0	*	
Tricosane	0	0	0	*	
Tetracosane	0	0	0	*	

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	SCM	Job:	
Location:			
Flowsheet:	Dehydration_x3		

Mass Fraction	12 %	13 %	15 %		
Pentacosane	0	0	0 *		
Hexacosane	0	0	0 *		
Heptacosane	0	0	0 *		
Octacosane	0	0	0 *		
Nonacosane	0	0	0 *		
Triacontane	0	0	0 *		
Water	0.899218	0.899218	0.15926 *		
Oxygen	0	0	0 *		
Sulfur Dioxide	0	0	0 *		
DGA	0	0	0 *		
MDEA	0.0194152	0.0194152	0 *		
Piperazine	0	0	0 *		
Triethylene Glycol	99.08	99.08	0 *		

Mass Flow	12 lb/h	13 lb/h	15 lb/h		
Nitrogen	0	0	519.027 *		
Carbon Dioxide	0	0	2813.06 *		
Hydrogen Sulfide	0	0	0.174611 *		
Methane	0	0	47075.6 *		
Ethane	0	0	5282.74 *		
Propane	0	0	3442.87 *		
i-Butane	0	0	2464.71 *		
n-Butane	0	0	2396.05 *		
2,2-Dimethylpropane	0	0	0 *		
i-Pentane	0	0	2021.53 *		
n-Pentane	0	0	964.186 *		
2,2-Dimethylbutane	0	0	0 *		
Cyclopentane	0	0	109.988 *		
2,3-Dimethylbutane	0	0	0 *		
2-Methylpentane	0	0	0 *		
3-Methylpentane	0	0	0 *		
n-Hexane	0	0	1297.26 *		
Methylcyclopentane	0	0	0 *		
Benzene	0.000834187	0.000834187	132.506 *		
Cyclohexane	0	0	217.434 *		
2-Methylhexane	0	0	0 *		
3-Methylhexane	0	0	0 *		
2,2,4-Trimethylpentane	0	0	26.9871 *		
n-Heptane	0	0	405.679 *		
Methylcyclohexane	0	0	208.638 *		
Toluene	0.00364779	0.00364779	134.14 *		
n-Octane	0	0	148.9 *		
Ethylbenzene	0.000335307	0.000335307	5.6872 *		
m-Xylene	0.00647517	0.00647517	99.1614 *		
p-Xylene	0	0	0 *		
o-Xylene	0	0	0 *		
n-Nonane	0	0	61.2184 *		
n-Decane	0	0	77.6853 *		
Undecane	0	0	0 *		
Dodecane	0	0	0 *		
Tridecane	0	0	0 *		
Tetradecane	0	0	0 *		
Pentadecane	0	0	0 *		
Hexadecane	0	0	0 *		
Heptadecane	0	0	0 *		
Octadecane	0	0	0 *		
Nonadecane	0	0	0 *		
Eicosane	0	0	0 *		
Heneicosane	0	0	0 *		
Docosane	0	0	0 *		

* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	SCM	Job:	
Location:			
Flowsheet:	Dehydration_x3		

Mass Flow	12 lb/h	13 lb/h	15 lb/h
Tricosane	0	0	0 *
Tetracosane	0	0	0 *
Pentacosane	0	0	0 *
Hexacosane	0	0	0 *
Heptacosane	0	0	0 *
Octacosane	0	0	0 *
Nonacosane	0	0	0 *
Triacontane	0	0	0 *
Water	7.54557	7.54557	111.509 *
Oxygen	0	0	0 *
Sulfur Dioxide	0	0	0 *
DGA	0	0	0 *
MDEA	0.162918	0.162918	0 *
Piperazine	0	0	0 *
Triethylene Glycol	831.406	831.406	0 *

Stream Properties

Property	Units	12	13	15
Temperature	°F	309.638	115 *	119.91 *
Pressure	psig	1223.7 *	1218.7	1223.7 *
Mole Fraction Vapor	%	0	0	100
Mole Fraction Light Liquid	%	100	100	0
Mole Fraction Heavy Liquid	%	0	0	0
Molecular Weight	lb/lbmol	140.872	140.872	20.3896
Mass Density	lb/ft^3	61.7382	68.894	4.91862
Molar Flow	lbmol/h	5.95665	5.95665	3433.94
Mass Flow	lb/h	839.126	839.126	70016.8
Vapor Volumetric Flow	ft^3/h	13.5917	12.18	14235.1
Liquid Volumetric Flow	gpm	1.69455	1.51854	1774.76
Std Vapor Volumetric Flow	MMSCFD	0.0542508	0.0542508	31.275 *
Std Liquid Volumetric Flow	sgpm	1.48678	1.48678	400.111
Compressibility		0.342269	0.408944	0.825371
Specific Gravity		0.989886	1.10462	0.703999
API Gravity		-6.89072	-6.89002	
Enthalpy	Btu/h	-1.84857E+06	-1.94611E+06	-1.26258E+08
Mass Enthalpy	Btu/lb	-2202.97	-2319.21	-1803.25
Mass Cp	Btu/(lb*°F)	0.636274	0.552483	0.661346
Ideal Gas CpCv Ratio		1.02752	1.03358	1.24447
Dynamic Viscosity	cP	1.49254	15.9146	0.0142617
Kinematic Viscosity	cSt	1.50922	14.4209	0.181012
Thermal Conductivity	Btu/(h*ft*°F)	0.110988 ?	0.11344	0.0247154
Surface Tension	lbf/ft	0.0023325	0.00296647	
Net Ideal Gas Heating Value	Btu/ft^3	3505.83	3505.83	1073.12
Net Liquid Heating Value	Btu/lb	9172.93	9172.93	19924.2
Gross Ideal Gas Heating Value	Btu/ft^3	3836.44	3836.44	1184.4
Gross Liquid Heating Value	Btu/lb	10063.5	10063.5	21995.3

Remarks

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification		
User Identification:	Tanks 800 and 801	
City:		
State:		
Company:		
Type of Tank:	Vertical Fixed Roof Tank	
Description:		
Tank Dimensions		
Shell Height (ft):		15.00
Diameter (ft):		15.50
Liquid Height (ft) :		14.00
Avg. Liquid Height (ft):		10.00
Volume (gallons):		21,000.00
Turnovers:		34.31
Net Throughput(gal/yr):		720,500.00
Is Tank Heated (y/n):	N	
Paint Characteristics		
Shell Color/Shade:	Aluminum/Specular	
Shell Condition	Good	
Roof Color/Shade:	Aluminum/Specular	
Roof Condition:	Good	
Roof Characteristics		
Type:	Cone	
Height (ft)		0.00
Slope (ft/ft) (Cone Roof)		0.06
Breather Vent Settings		
Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.03

Meterological Data used in Emissions Calculations: Midland-Odessa, Texas (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Tanks 800 and 801 - Vertical Fixed Roof Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 12)	Jan	58.09	50.21	65.97	64.62	6.1279	5.2623	7.1034	64.0000			92.00	Option 4: RVP=12, ASTM Slope=3
Gasoline (RVP 12)	Feb	61.03	52.16	69.90	64.62	6.4784	5.4667	7.6339	64.0000			92.00	Option 4: RVP=12, ASTM Slope=3
Gasoline (RVP 12)	Mar	66.04	55.72	76.35	64.62	7.1126	5.8568	8.5733	64.0000			92.00	Option 4: RVP=12, ASTM Slope=3
Gasoline (RVP 12)	Apr	70.94	59.86	82.03	64.62	7.7803	6.3372	9.4722	64.0000			92.00	Option 4: RVP=12, ASTM Slope=3
Gasoline (RVP 12)	May	75.04	63.70	86.37	64.62	8.3748	6.8110	10.2098	64.0000			92.00	Option 4: RVP=12, ASTM Slope=3
Gasoline (RVP 12)	Jun	78.33	67.01	89.64	64.62	8.8785	7.2419	10.7939	64.0000			92.00	Option 4: RVP=12, ASTM Slope=3
Gasoline (RVP 12)	Jul	79.12	68.18	90.05	64.62	9.0030	7.3991	10.8693	64.0000			92.00	Option 4: RVP=12, ASTM Slope=3
Gasoline (RVP 12)	Aug	78.05	67.67	88.44	64.62	8.8353	7.3294	10.5755	64.0000			92.00	Option 4: RVP=12, ASTM Slope=3
Gasoline (RVP 12)	Sep	73.69	64.64	82.73	64.62	8.1751	6.9312	9.5894	64.0000			92.00	Option 4: RVP=12, ASTM Slope=3
Gasoline (RVP 12)	Oct	68.86	60.03	77.68	64.62	7.4907	6.3582	8.7776	64.0000			92.00	Option 4: RVP=12, ASTM Slope=3
Gasoline (RVP 12)	Nov	62.81	54.79	70.83	64.62	6.6987	5.7529	7.7641	64.0000			92.00	Option 4: RVP=12, ASTM Slope=3
Gasoline (RVP 12)	Dec	58.79	51.18	66.40	64.62	6.2100	5.3633	7.1599	64.0000			92.00	Option 4: RVP=12, ASTM Slope=3

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Tanks 800 and 801 - Vertical Fixed Roof Tank

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	248.7049	275.8135	421.0307	524.7498	655.7545	735.6317	763.0196	687.2899	475.8583	396.8873	282.1787	243.1498
Vapor Space Volume (cu ft):	973.9254	973.9254	973.9254	973.9254	973.9254	973.9254	973.9254	973.9254	973.9254	973.9254	973.9254	973.9254
Vapor Density (lb/cu ft):	0.0706	0.0742	0.0807	0.0875	0.0934	0.0984	0.0997	0.0980	0.0914	0.0845	0.0765	0.0714
Vapor Space Expansion Factor:	0.3098	0.3779	0.5091	0.6425	0.7652	0.8771	0.8782	0.7938	0.5766	0.4742	0.3578	0.3043
Vented Vapor Saturation Factor:	0.3736	0.3607	0.3395	0.3197	0.3039	0.2917	0.2888	0.2927	0.3090	0.3280	0.3530	0.3705
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	973.9254	973.9254	973.9254	973.9254	973.9254	973.9254	973.9254	973.9254	973.9254	973.9254	973.9254	973.9254
Tank Diameter (ft):	15.5000	15.5000	15.5000	15.5000	15.5000	15.5000	15.5000	15.5000	15.5000	15.5000	15.5000	15.5000
Vapor Space Outage (ft):	5.1615	5.1615	5.1615	5.1615	5.1615	5.1615	5.1615	5.1615	5.1615	5.1615	5.1615	5.1615
Tank Shell Height (ft):	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000
Average Liquid Height (ft):	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000
Roof Outage (ft):	0.1615	0.1615	0.1615	0.1615	0.1615	0.1615	0.1615	0.1615	0.1615	0.1615	0.1615	0.1615
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.1615	0.1615	0.1615	0.1615	0.1615	0.1615	0.1615	0.1615	0.1615	0.1615	0.1615	0.1615
Roof Height (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Roof Slope (ft/ft):	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625
Shell Radius (ft):	7.7500	7.7500	7.7500	7.7500	7.7500	7.7500	7.7500	7.7500	7.7500	7.7500	7.7500	7.7500
Vapor Density												
Vapor Density (lb/cu ft):	0.0706	0.0742	0.0807	0.0875	0.0934	0.0984	0.0997	0.0980	0.0914	0.0845	0.0765	0.0714
Vapor Molecular Weight (lb/lb-mole):	64.0000	64.0000	64.0000	64.0000	64.0000	64.0000	64.0000	64.0000	64.0000	64.0000	64.0000	64.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.1279	6.4784	7.1126	7.7803	8.3748	8.8785	9.0030	8.8353	8.1751	7.4907	6.6987	6.2100
Daily Avg. Liquid Surface Temp. (deg. R):	517.7577	520.6966	525.7084	530.6117	534.7060	537.9981	538.7892	537.7221	533.3571	528.5271	522.4788	518.4578
Daily Average Ambient Temp. (deg. F):	42.5000	47.1000	55.7000	64.6000	72.7500	79.5500	81.9500	80.8000	73.2500	63.9500	52.5500	44.6000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	524.2850	524.2850	524.2850	524.2850	524.2850	524.2850	524.2850	524.2850	524.2850	524.2850	524.2850	524.2850
Tank Paint Solar Absorptance (Shell):	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900
Tank Paint Solar Absorptance (Roof):	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900	0.3900
Daily Total Solar Insulation Factor (Btu/sqft day):	1,039.8938	1,336.6585	1,734.5151	2,055.5923	2,220.5727	2,317.9746	2,231.9945	2,049.8815	1,711.3544	1,471.8155	1,136.7784	987.0390
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.3098	0.3779	0.5091	0.6425	0.7652	0.8771	0.8782	0.7938	0.5766	0.4742	0.3578	0.3043
Daily Vapor Temperature Range (deg. R):	31.5135	35.4763	41.2609	44.3351	45.3447	45.2583	43.7414	41.5367	38.1840	35.2982	32.0696	30.4321
Daily Vapor Pressure Range (psia):	1.8410	2.1673	2.7165	3.1350	3.3989	3.5520	3.4703	3.2461	2.6581	2.4195	2.0111	1.7966
Breather Vent Press. Setting Range(psia):	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.1279	6.4784	7.1126	7.7803	8.3748	8.8785	9.0030	8.8353	8.1751	7.4907	6.6987	6.2100
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	5.2623	5.4667	5.8568	6.3372	6.8110	7.2419	7.3991	7.3294	6.9312	6.3582	5.7529	5.3633
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	7.1034	7.6339	8.5733	9.4722	10.2098	10.7939	10.8893	10.5755	9.5894	8.7776	7.7641	7.1599
Daily Avg. Liquid Surface Temp. (deg R):	517.7577	520.6966	525.7084	530.6117	534.7060	537.9981	538.7892	537.7221	533.3571	528.5271	522.4788	518.4578
Daily Min. Liquid Surface Temp. (deg R):	509.8793	511.8276	515.3912	519.5279	523.3688	526.6840	527.8538	527.3379	524.3111	519.7030	514.4614	510.8498
Daily Max. Liquid Surface Temp. (deg R):	525.6361	529.5657	536.0217	541.6954	546.0421	549.3122	549.7245	548.1063	542.4031	537.3511	530.4962	526.0659
Daily Ambient Temp. Range (deg. R):	28.0000	29.0000	31.0000	30.4000	29.3000	27.7000	26.8000	26.8000	24.3000	28.7000	27.3000	27.6000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.3736	0.3607	0.3395	0.3197	0.3039	0.2917	0.2888	0.2927	0.3090	0.3280	0.3530	0.3705
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.1279	6.4784	7.1126	7.7803	8.3748	8.8785	9.0030	8.8353	8.1751	7.4907	6.6987	6.2100
Vapor Space Outage (ft):	5.1615	5.1615	5.1615	5.1615	5.1615	5.1615	5.1615	5.1615	5.1615	5.1615	5.1615	5.1615
Working Losses (lb):	560.6550	592.7257	650.7460	711.8373	766.2318	812.3079	823.6993	808.3631	747.9602	685.3432	612.8734	568.1667
Vapor Molecular Weight (lb/lb-mole):	64.0000	64.0000	64.0000	64.0000	64.0000	64.0000	64.0000	64.0000	64.0000	64.0000	64.0000	64.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.1279	6.4784	7.1126	7.7803	8.3748	8.8785	9.0030	8.8353	8.1751	7.4907	6.6987	6.2100
Net Throughput (gal/mo.):	60,041.6667	60,041.6667	60,041.6667	60,041.6667	60,041.6667	60,041.6667	60,041.6667	60,041.6667	60,041.6667	60,041.6667	60,041.6667	60,041.6667
Annual Turnovers:	34.3095	34.3095	34.3095	34.3095	34.3095	34.3095	34.3095	34.3095	34.3095	34.3095	34.3095	34.3095
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (gal):	21,000.0000	21,000.0000	21,000.0000	21,000.0000	21,000.0000	21,000.0000	21,000.0000	21,000.0000	21,000.0000	21,000.0000	21,000.0000	21,000.0000
Maximum Liquid Height (ft):	14.0000	14.0000	14.0000	14.0000	14.0000	14.0000	14.0000	14.0000	14.0000	14.0000	14.0000	14.0000
Tank Diameter (ft):	15.5000	15.5000	15.5000	15.5000	15.5000	15.5000	15.5000	15.5000	15.5000	15.5000	15.5000	15.5000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	807.3599	888.5392	1,071.7767	1,236.5871	1,421.9863	1,547.9398	1,586.7188	1,495.6530	1,223.8185	1,082.2304	895.0521	811.3165

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

Tanks 800 and 801 - Vertical Fixed Roof Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 12)	8,340.91	5,708.07	14,048.98

SCM Ameredev South NSR Application
Data Ref: Samples Analysis Sent by SCM

Components

Sample Date	Hydrogen Sulfide Mole %	Hydrogen Sulfide BTU	Nitrogen Mole %	Nitrogen BTU	Carbon Dioxide Mole %	Carbon Dioxide BTU	Methane Mole %	Methane BTU	Ethane Mole %	Ethane BTU	Propane Mole %	Propane BTU
2/15/2019	2.4507		1.1025		3.3609		72.1904		10.3684		5.5055	
2/15/2019	2.4507	15.6131	1.1025		3.3609		72.1904	729.125	10.3684	183.489	5.5055	138.525
3/18/2019	1.2479	7.9504	2.0077		4.0095		78.7117	794.989	6.425	113.703	3.2899	82.776
3/25/2019	1.2041	7.6711	2.1028		3.7844		78.1414	789.229	6.7471	119.403	3.4613	87.091
3/25/2019	1.2041		2.1028		3.7844		78.1414		6.7471		3.4613	
4/3/2019	1.2577	8.0129	2.588		3.9696		77.8974	786.76	6.4698	114.496	3.3022	83.068
4/3/2019	1.2577		2.588		3.9696		77.8974		6.4698		3.3022	
4/16/2019	1.175	7.4858	2.3731		3.6555		77.7752	785.527	6.8075	120.472	3.4474	86.741
4/16/2019	1.175		2.3731		3.6555		77.7752		6.8075		3.4474	
4/25/2019	1.3	8.2822	1.7064		4.0958		78.9332	797.226	6.3735	112.792	3.2439	81.621
4/25/2019	1.3		1.7064		4.0958		78.9332		6.3735		3.2439	
5/7/2019	1.2485	7.9542	2.4187		3.8125		78.1841	789.662	6.4574	114.277	3.2345	81.382
5/7/2019	1.2485		2.4187		3.8125		78.1841		6.4574		3.2345	
5/20/2019	1.1616	7.4003	3.4594		4.2322		79.8044	806.027	5.6905	100.702	2.5824	64.975
5/20/2019	1.1616		3.4594		4.2322		79.8044		5.6905		2.5824	
9/15/2019	0.8249	5.2552	10.6618		2.5732		65.8392	664.975	9.1408	161.765	5.3635	134.952
3/13/2019	1.252		2.0647		4.0999		78.6471		6.4022		3.2601	
3/13/2019	1.252	7.9766	2.0647		4.0999		78.6471	794.336	6.4022	113.299	3.2601	82.028
7/28/2019	0.8171	5.2057	2.8821		1.9523		70.0204	707.207	12.2862	217.43	6.9909	175.897
8/23/2019	0.877	5.5915	11.15		2.365		63.7528	643.699	9.5122	168.338	5.8544	147.303
6/17/2019	1		31.554		2.396		50.057		7.207		3.996	
Average	1.279558	7.866583	4.467943		3.5932		74.83274	757.1968	7.390648	136.6805	3.884252	103.8649
Maximum	2.4507	15.6131	31.554		4.2322		79.8044	806.027	12.2862	217.43	6.9909	175.897
Minimum	0.8171	5.2057	1.1025		1.9523		50.057	643.699	5.6905	100.702	2.5824	64.975
95th Percentile	2.4507	11.58111	11.15		4.2322		79.8044	801.1865	10.3684	198.7625	5.8544	160.1705

Sample Date	Iso-Butane Mole %	Iso-Butane BTU	n-Butane Mole %	n-Butane BTU	Iso-Pentane Mole %	Iso-Pentane BTU	n-Pentane Mole %	n-Pentane BTU	Cyclopentane Mole %	Cyclopentane BTU	n-Hexane Mole %	n-Hexane BTU
2/15/2019	1.0345		2.1052		0.6395		0.5301		0.0399		0.1309	
2/15/2019	1.0345	33.636	2.1052	68.677	0.6395	26.387	0.5301	21.248				
3/18/2019	0.9914	32.239	1.4764	48.165	0.6577	26.313	0.4529	18.156				
3/25/2019	1.0108	32.854	1.608	52.459	0.6929	27.722	0.482	19.322				
3/25/2019	1.0105		1.608		0.6929		0.482		0.0424		0.1396	
4/3/2019	1.0029	32.613	1.5631	50.994	0.6895	27.587	0.4778	19.155				
4/3/2019	1.0029		1.5631		0.6895		0.4778		0.0431		0.1425	
4/16/2019	0.9952	32.364	1.6264	53.059	0.7073	28.3	0.5174	20.741				
4/16/2019	0.9952		1.6264		0.7073		0.5174		0.0466		0.1689	
4/25/2019	0.995	32.357	1.4743	48.096	0.6691	26.769	0.4575	18.338				
4/25/2019	0.995		1.4743		0.6691		0.4575		0.0412		0.1361	
5/7/2019	0.9785	31.82	1.561	50.924	0.7217	28.874	0.5082	20.373				
5/7/2019	0.9785		1.561		0.7217		0.5082		0.0477		0.1615	
5/20/2019	0.8445	27.463	1.0594	34.539	0.4337	17.35	0.271	10.864				
5/20/2019	0.8445		1.0594		0.4337		0.271		0.0217		0.0761	
9/15/2019	1.1603	37.733	2.285	74.478	0.751	30.047	0.5948	23.844				
3/13/2019	1.0028		1.4729		0.6418		0.4413		0.038		0.1236	
3/13/2019	1.0028	32.609	1.4729	48.05	0.6418	25.756	0.4413	17.691				
7/28/2019	0.9962	32.394	2.2774	74.294	0.5983	23.939	0.5323	21.338				
8/23/2019	1.2415	40.373	2.4098	78.616	0.9027	36.117	0.7423	29.795				
6/17/2019	0.779		1.466		0.312		0.404					
Average	0.995019	33.20458	1.659676	56.86425	0.639841	27.09675	0.480805	20.07192	0.0401		0.134925	
Maximum	1.2415	40.373	2.4098	78.616	0.9027	36.117	0.7423	29.795	0.0477		0.1695	
Minimum	0.779	27.463	1.0594	34.539	0.4337	17.35	0.271	10.864	0.0217		0.0761	
95th Percentile	1.1603	38.921	2.285	76.3401	0.751	32.7785	0.5948	26.52105	0.047385		0.1665	

Sample Date	Cyclohexane Mole %	Cyclohexane BTU	Other Hexanes Mole %	Other Hexanes BTU	Heptanes Mole %	Heptanes BTU	Methylcyclohexane Mole %	Methylcyclohexane BTU	2,2,4-Trimethylpentane Mole %	2,2,4-Trimethylpentane BTU	Benzene Mole %	Benzene BTU	Toluene Mole %	Toluene BTU
2/15/2019	0.0695		0.2254		0.1072		0.0289		0.0002		0.0406		0.0137	
2/15/2019														
3/18/2019														
3/25/2019														
3/25/2019	0.0757		0.2488		0.1229		0.0584		0.0043		0.0368		0.0205	
4/3/2019														
4/3/2019	0.0769		0.2588		0.1259		0.0398		0.0044		0.0374		0.0207	
4/16/2019														
4/16/2019	0.0958		0.2732		0.1504		0.0542		0.006		0.044		0.0271	
4/25/2019														
4/25/2019	0.0728		0.243		0.1214		0.0384		0.0043		0.0367		0.0205	
5/7/2019														
5/7/2019	0.088		0.2814		0.14		0.0458		0.0051		0.043		0.024	
5/20/2019														
5/20/2019	0.0458		0.1276		0.0748		0.0294		0.0033		0.0209		0.0139	
9/15/2019														
3/13/2019	0.0664		0.2219		0.1158		0.0517		0.0038		0.031		0.014	
3/13/2019														
7/28/2019														
8/23/2019														
6/17/2019														
Average	0.073663		0.234158		0.119563		0.038575		0.0048		0.0365		0.019275	
Maximum	0.0958		0.2814		0.1504		0.0542		0.006		0.044		0.0271	
Minimum	0.0458		0.1276		0.0748		0.0289		0.0032		0.0209		0.0137	
95th Percentile	0.08807		0.27838		0.14676		0.05126		0.005685		0.04363		0.026015	

Sample Date	Ethylbenzene Mole %	Ethylbenzene BTU	Xylenes Mole %	Xylenes BTU	Octanes Mole %	Octanes BTU	Nonanes Mole %	Nonanes BTU	Decanes+ Mole %	Decanes+ BTU	Hexanes+ Mole %	Hexanes+ BTU	Totals Mole %	Totals BTU
2/15/2019	0.001		0.0022		0.0171		0.0047		0.0101				100	0
2/15/2019											0.6806	32.227	100	1248.927
3/18/2019											0.7299	34.121	100	1158.412
3/25/2019											0.7657	35.699	100	1171.43
3/25/2019	0.0008		0.0035		0.0216		0.0049		0.0075				100	0
4/3/2019											0.732	36.501	100	1159.207
4/3/2019	0.0007		0.0031		0.0216		0.0046		0.0095				100	0
4/16/2019											0.9202	45.179	100	1177.869
4/16/2019	0.0009		0.0044		0.0316		0.0067		0.0098				100	0
4/25/2019											0.7515	35.098	100	1160.574
4/25/2019	0.0009		0.0001		0.0214		0.0075		0.0072				100	0
5/7/2019											0.8749	40.657	100	1165.923
5/7/2019	0.0009		0.0055		0.0236		0.005		0.0056				100	0
5/20/2019											0.4811	23.746	100	1093.086
5/20/2019	0.0004		0.0041		0.0193		0.0069		0.0069				100	0
9/15/2019											0.6055	37.118	100	1170.167
3/13/2019	0.0015		0.0052		0.0214		0.0056		0.0128				100	0
3/13/2019											0.7132	34.214	100	1155.96
7/28/2019											0.6668	30.866	100	1288.571
8/23/2019											1.0108	46.658	100	1196.469
6/17/2019											0.665		100	0
Average	0.000888		0.003013		0.022225		0.005738		0.054985		0.758231	35.85825		
Maximum	0.0015		0.0044		0.0316		0.0075		0.0069		1.0108	46.658		
Minimum	0.0004		0.0001		0.0173		0.0046		0.0056		0.4811	23.746		
95th Percentile	0.001325		0.004295		0.0288		0.00729		0.035465		0.95644	44.71555		

Gas Analysis/Config	
U Factor	1.219.6300
Carbon Dioxide (CO2)	**0.0059**
Contract Hour	9
Ethane (C2)	**6.9980**
Hydrogen Sulfide (H2S)	**0.0000**
i-Butane (IC4)	**1.0443**
i-Pentane (IC5)	**0.6851**
Methane (C1)	**84.2986**
n-Butane (NC4)	**1.6156**
n-Heptane (NC7)	**0.0000**
n-Hexane (NC6)	**0.5367**
n-Pentane (NC5)	**0.4524**
Nitrogen (N2)	**0.8295**
Pipe Size	3.826
Plate Size	0.750
Propane (C3)	**3.5339**
SPG	0.7019
ater (H2O)	**0.0000**

Table C-2 to Subpart C of Part 98 - Default CH^4 and N^2O Emission Factors for Various Types of Fuel

Fuel type	Default CH^4 emission factor (kg CH^4/mmBtu)	Default N^2O emission factor (kg N^2O/mmBtu)
Coal and Coke (All fuel types in Table C-1)	1.1×10^{-02}	1.6×10^{-03}
Natural Gas	1.0×10^{-03}	1.0×10^{-04}
Petroleum Products (All fuel types in Table C-1)	3.0×10^{-03}	6.0×10^{-04}
Fuel Gas	3.0×10^{-03}	6.0×10^{-04}
[illegible]	[illegible]	[illegible]
Blast Furnace Gas	2.2×10^{-05}	1.0×10^{-04}
Coke Oven Gas	4.8×10^{-04}	1.0×10^{-04}
Biomass Fuels - Solid (All fuel types in Table C-1, except wood and wood residuals)	3.2×10^{-02}	4.2×10^{-03}
Wood and wood residuals	7.2×10^{-03}	3.6×10^{-03}
Biomass Fuels - Gaseous (All fuel types in Table C-1)	3.2×10^{-03}	6.3×10^{-04}
Biomass Fuels - Liquid (All fuel types in Table C-1)	1.1×10^{-03}	1.1×10^{-04}

Note: Those employing this table are assumed to fall under the IPCC definitions of the "Energy Industry" or "Manufacturing Industries and Construction". In all fuels except for coal the values for these two categories are identical. For coal combustion, those who fall within the IPCC "Energy Industry" category may employ a value of 1g of CH^4/mmBtu.

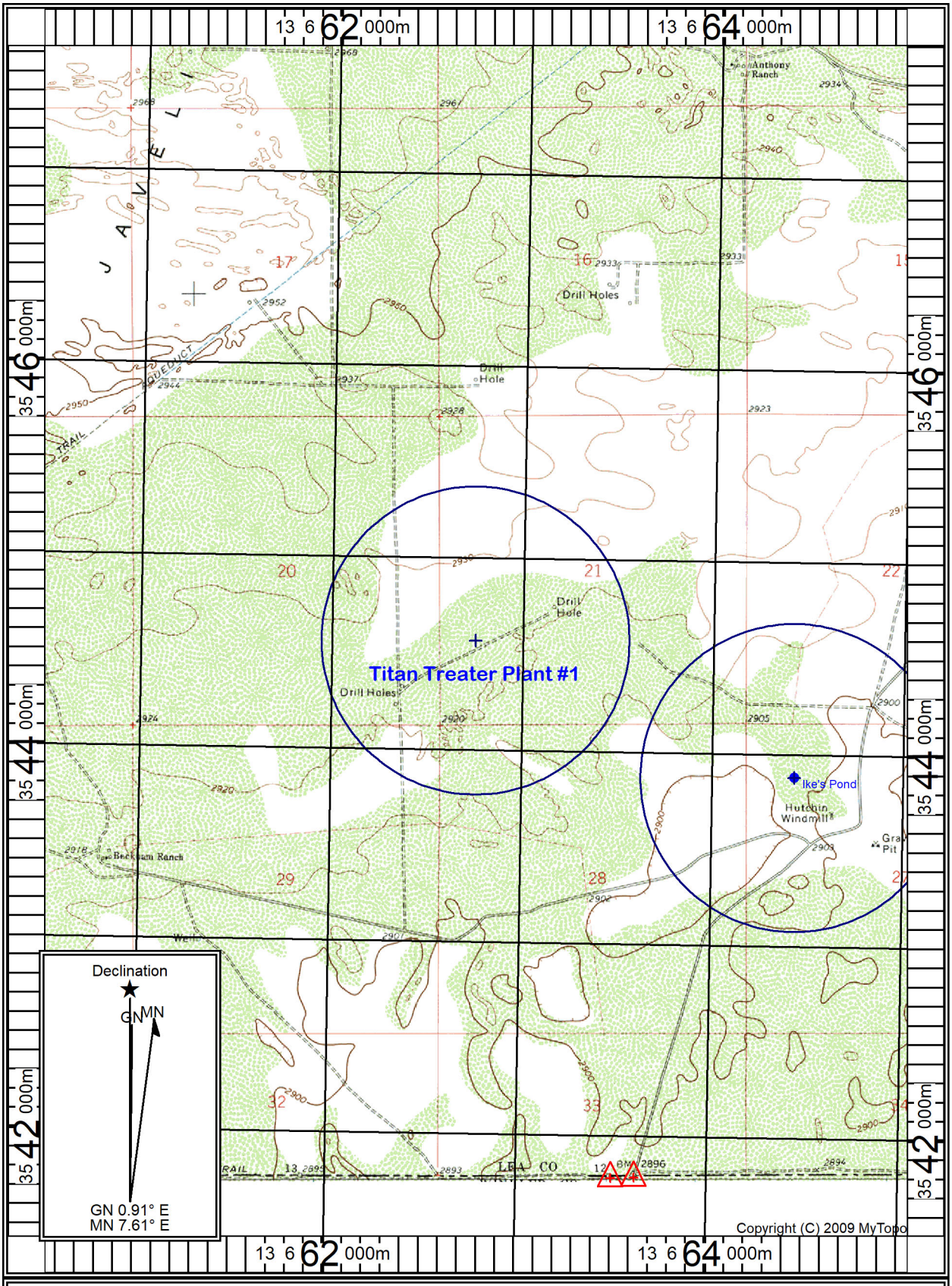
Section 8

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 map of the facility has been attached on the following page.



Map Name: JAVELINA BASIN (NM Scale: 1 inch = 2,500 ft. Horizontal Datum: WGS84
Print Date: 11/28/23 Map Center: 13 0662750 E 3544570

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.


U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only
For delivery information, visit our website
OFFICIAL
Postage $
Certified Fee
Return Receipt Fee (Endorsement Required)
Restricted Delivery Fee (Endorsement Required)
$0.00
US POSTAGE
12/4/2023
062S12395454
87113
000028255
7014 2870 0001 4719 1958
Sent To
NGL SOUTH RANCH INC
2424 RIDGE RD
ROCKWELL, TX 75087
PS Form 380


U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only
For delivery information, visit our website
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Certified Fee
Return Receipt Fee (Endorsement Required)
Restricted Delivery Fee (Endorsement Required)
$0.00
US POSTAGE
12/4/2023
062S12395454
87113
000028256
7014 2870 0001 4719 1965
Sent To
JAL CITY MANAGER
710 WYOMING AVE
JAL, NM 88252
PS Form 3800


U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
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For delivery information, visit our website
OFFICIAL
Postage $
Certified Fee
Return Receipt Fee (Endorsement Required)
Restricted Delivery Fee (Endorsement Required)
$0.00
US POSTAGE
12/4/2023
062S12395454
87113
000028257
7014 2870 0001 4722 7565
Sent To
LEA COUNTY – COUNTY MANAGER
100 N. MAIN AVENUE, SUITE 4
LOVINGTON, NM 88260
PS Form 380

Click to Print

Owner Information

Owner # 216634 **District** 190

NORTHWIND MIDSTREAM PARTNERS LLC

825 TOWN AND COUNTRY LN

STE 700

HOUSTON TX 77024

Estimated Taxes for Owner

Estimated Tax	Estimated Year used
$.	

Calculate Estimated Tax

Recap Value Information

Central Full Value	0	**Full Value**	685200
Land Full Value	685200	**Taxable Value**	228400
Improvements Full value	0	**Exempt Value**	0
Personal Property Full Value	0	**Net Value**	228400
Manufactured Home Full Value	0		

Livestock Full Value	0

Property Information

Property Code 4000516490005

Book 2211 **Page** 830 **Reception#** 37448

Physical Address

Bldg **Apt**

Section 21 **Township** 26 S **Range** 36 E

68.52 AC LOC W2 OF THE W2
TRACT 1
BEG AT THE WEST LINE OF SAID
SECTION 21, FOR THE SW CORNER OF
SAID SECTION 21 BEARS,S00D37'39"E
857.28'; TH N00D37'39"W ALONG THE
WEST LINE OF SAID SECTION 21,
1766.62' FOR THE W4 CORNER OF SAID
SECTION 21; TH N00D33'57"W
CONTINUING ALONG THE WEST LINE OF
SAID SECTION 21, 775.87' FOUND FOR
THE NW CORNER OF SAID SECTION 21
BEARS, N00D33'57"W 1864.28' SET FOR
THE NW CORNER OF THIS HEREIN
DESCRIBED TRACT;TH OVER AND ACROSS
SAID NGL SOUTH RANCH INC TRACT
FOLLOWING COURSES AND DISTANCES:
S89D24'32"E 1451.40';
S01D34'37"W 1741.39';
N88D25'23"W 461.10';
S01D34'37"W 336.63';
S62D56'44"W 1017.55' TO THE POB
30'ACCESS EASE CROSSING SEC 20,29
7/23/21-AFFI/NAME CHNG BK 2183/517
6/22/23-NGL-TITAN PLAT BK 2/872,
CAB H, SLIDE 201
6/30/23-NGL SOUTH RANCH INC

Property Value Information

150	Non-Residential	Land	68.52	0.00	685200

December 5, 2023

CERTIFIED MAIL 7014 2870 0001 4719 1958
RETURN RECEIPT REQUESTED *(certified mail is required, **return receipt is optional**)*

Dear **Neighbor,**
Northwind Midstream Partners, LLC announces its application submittal to the New Mexico Environment Department for an air quality permit for the **modification** of its **natural gas production** facility. The expected date of application submittal to the Air Quality Bureau is **December 8, 2023.**

The exact location for the proposed facility known as, **Titan Treater Plant #1**, is at **32.02558** dec deg North and **-103.27657** dec deg West. The approximate location of this facility is **7.8** miles **southwest** of **Jal, NM** in **Lea** county.

The proposed **modification** consists of the installation of one (1) Caterpillar G3516B compressor engine.

The estimated maximum quantities of any regulated air contaminant will be as follows in pound per hour (pph) and tons per year (tpy) and may change slightly during the course of the Department's review:

Pollutant:	Pounds per hour	Tons per year
Particulate Matter (PM)	1	3
PM_{10}	3	7
$PM_{2.5}$	3	7
Hydrogen Sulfide (H2S)	9	1
Sulfur Dioxide (SO_2)	6,980	65
Nitrogen Oxides (NO_x)	58	88
Carbon Monoxide (CO)	107	111
Volatile Organic Compounds (VOC)	199	81
Total sum of all Hazardous Air Pollutants (HAPs)	16	24.9
Green House Gas Emissions as Total CO_2e	N/A	77,274

The standard operating schedule of the facility will be 24 hours a day, 7 days a week, 52 weeks per year.

Owners and operators of the facility include
Northwind Midstream Partners, LLC
825 Town and Country Lane
Suite 700
Houston, TX 77024

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,
Northwind Midstream Partners, LLC
825 Town and Country Lane
Suite 700
Houston, TX 77024

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.

December 5, 2023

CERTIFIED MAIL 7014 2870 0001 4719 1965
RETURN RECEIPT REQUESTED *(certified mail is required, **return receipt is optional**)*

Dear **Municipal Official,**
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Table of Noticed Citizens

Name	Address	City	State	Zip Code
NGL SOUTH RANCH INC	2424 RIDGE RD	ROCKWELL	TX	75087

Table of Noticed Municipalities

Name	Address	City	State	Zip Code
JAL CITY MANAGER	710 WYOMING AVE	JAL	NM	88252

Table of Noticed Counties

Name	Address	City	State	Zip Code
LEA COUNTY - COUNTY MANAGER	100 N. MAIN AVENUE, SUITE 4	LOVINGTON	NM	88260

Table of Noticed Tribes

Name	Address	City	State	Zip Code
N/A				

Submittal of Public Service Announcement – Certification

I, Daniel Dolce, the undersigned, certify that on **December 20, 2023**, submitted a public service announcement to **Z 94 KZOR** that serves the City\Town\Village of **Hobbs**, **Lea** County, New Mexico, in which the source is or is proposed to be located and that **Z 94 KZOR DID NOT RESPOND.**

Signed this 20 day of December, 2023,

Daniel Dolce
Signature

12/20/2023
Date

Daniel Dolce
Printed Name

Associate Consultant - Trinity Consultants
Title {APPLICANT OR RELATIONSHIP TO APPLICANT}

Daniel Dolce

From: Daniel Dolce
Sent: Wednesday, December 20, 2023 2:01 PM
To: dawn@1radiosquare.com
Subject: Northwind Titan Treater Plant #1 - PSA Request

Dear Dawn,

Below is a public service announcement request for **Northwind Midstream Partners, LLC** for their **Titan Treater Plant #1.**

Per New Mexico Administrative Code 20.2.72.203.B NMAC and according to the Guidance for Public Notice for Air Quality Permit Applications – **(5) Notifications: Submittal of Public Service Announcement (PSA):** A public service announcement required for permits and significant permit revisions must be submitted to at least one radio or television station, which services the municipality, or county which the facility is or will be located. **Therefore, based on the above, we respectfully ask you to air the information shown below as a Public Service Announcement.**

The public service announcement request must contain the following information about the facility or proposed facility (20.2.72.203.D NMAC).

The name **Titan Treater Plant #1**, location: **32.02558°N and -103.27657°W**, and type of business: **Natural Gas Production.**

a. The name and principal owner or operator: **Northwind Midstream Partners, LLC** – owner and operator.
b. The type of process or change for which the permit is sought: **NSR Significant Revision – adding one Caterpillar G3516B compressor engine.**
c. Locations where the notices have been posted in Loving, NM 88256: **(1) Titan Treater Plant#1 Facility Entrance (2) Post Office, 111 S 4th St, Jal, NM 88252 (3) Coles Diner, 232 S Main St, Jal, NM, 88252 (4) Lowe's Grocery Store, 100 Curry Ave, Jal, NM 88252**
d. The Department's address or telephone number to which comments may be directed: **Permit Programs manager; New Mexico Environment Department; Air Quality Bureau; 525 Camino de los Marquez, Suite 1, Santa Fe, New Mexico; 87505-1816; (505) 476-4300; 1 (800) 224-7009.**

Thank you and regards,
Daniel Dolce

Daniel Dolce
Associate Consultant

P 505.266.6611 M 505.818.8761
Email: daniel.dolce@trinityconsultants.com
9400 Holly Avenue NE, Building 3, Suite B, Albuquerque, NM 87122

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
December 07, 2023
and ending with the issue dated
December 07, 2023.

Publisher

Sworn and subscribed to before me this 7th day of December 2023.

Business Manager

My commission expires
January 29, 2027
(Seal)

STATE OF NEW MEXICO
NOTARY PUBLIC
GUSSIE RUTH BLACK
COMMISSION # 1087528
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
December 7, 2023

NOTICE OF AIR QUALITY PERMIT APPLICATION

Northwind Midstream Partners, LLC announces its application submittal to the New Mexico Environment Department for an air quality permit for the **modification** of its natural gas production facility. The expected date of application submittal to the Air Quality Bureau is **December 8, 2023**.

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Green House Gas Emissions as Total CO_2e	N/A	77,274

The standard operating schedule of the facility will be 24 hours a day, 7 days a week, 52 weeks per year.

The owner and/or operator of the Facility is:
Northwind Midstream Partners, LLC
825 Town and Country Lane
Suite 700
Houston, TX 77024

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
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.
#00285566

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TRINITY CONSULTANTS
12700 PARK CENTRAL DR., STE. 600
DALLAS, TX 75251

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
December 07, 2023
and ending with the issue dated
December 07, 2023.

Publisher

Sworn and subscribed to before me this 7th day of December 2023.

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 APPLICAT

Northwind Midstream Partners, LLC announces its application submittal to the New Department for an air quality permit for the **modification** of its natural gas productio date of application submittal to the Air Quality Bureau is **December 8, 2023.**

The exact location for the proposed facility known as, **Titan Treater Plant #1**, is at **32. -103.27657** dec deg West. The approximate location of this facility is **7.8** miles **southv** county.

The proposed **modification** consists of the installation of one (1) Caterpillar G3516B c

The estimated maximum quantities of any regulated air contaminant will be as follow (pph) and tons per year (tpy) and could change slightly during the course of the Depa

Pollutant:	Pounds per hour	Tons p
Particulate Matter (PM)	1	
PM_{10}	3	
$PM_{2.5}$	3	
Hydrogen Sulfide (H_2S)	9	
Sulfur Dioxide (SO_2)	6,980	6
Nitrogen Oxides (NO_x)	58	8
Carbon Monoxide (CO)	107	1
Volatile Organic Compounds (VOC)	199	8
Total sum of all Hazardous Air Pollutants (HAPs)	16	2
Green House Gas Emissions as Total CO_2e	N/A	77,

The standard operating schedule of the facility will be 24 hours a day, 7 days a week,

The owner and/or operator of the Facility is:
Northwind Midstream Partners, LLC
825 Town and Country Lane
Suite 700
Houston, TX 77024

If you have any comments about the construction or operation of this facility, and you be made as part of the permit review process, you must submit your comments in wr Permit Programs Manager; New Mexico Environment Department; Air Quality Bureau Marquez, Suite 1; Santa Fe, New Mexico; 87505-1816. Other comments and question 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 since the Department may have not yet received the permit application. Please inclu mailing address with your comments. Once the Department has performed a prelimi application and its air quality impacts, the Department's notice will be published in th newspaper circulated near the facility location.

General information about air quality and the permitting process, and links to the re the Air Quality Bureau's website: www.env.nm.gov/air-quality/permitting-section-ho

ment activity for 12-5-
23
• 36 calls for service.
• One accident: without injury 100 block S. Main St.
• Three criminal incidents: information 1400 block S. 6th St.; information 500 a mistake, call 391-5435. this space daily. If you find errors will be corrected in occur. Confirmed factual reporting, mistakes may place to ensure accurate reports. Although numerous safeguards are in

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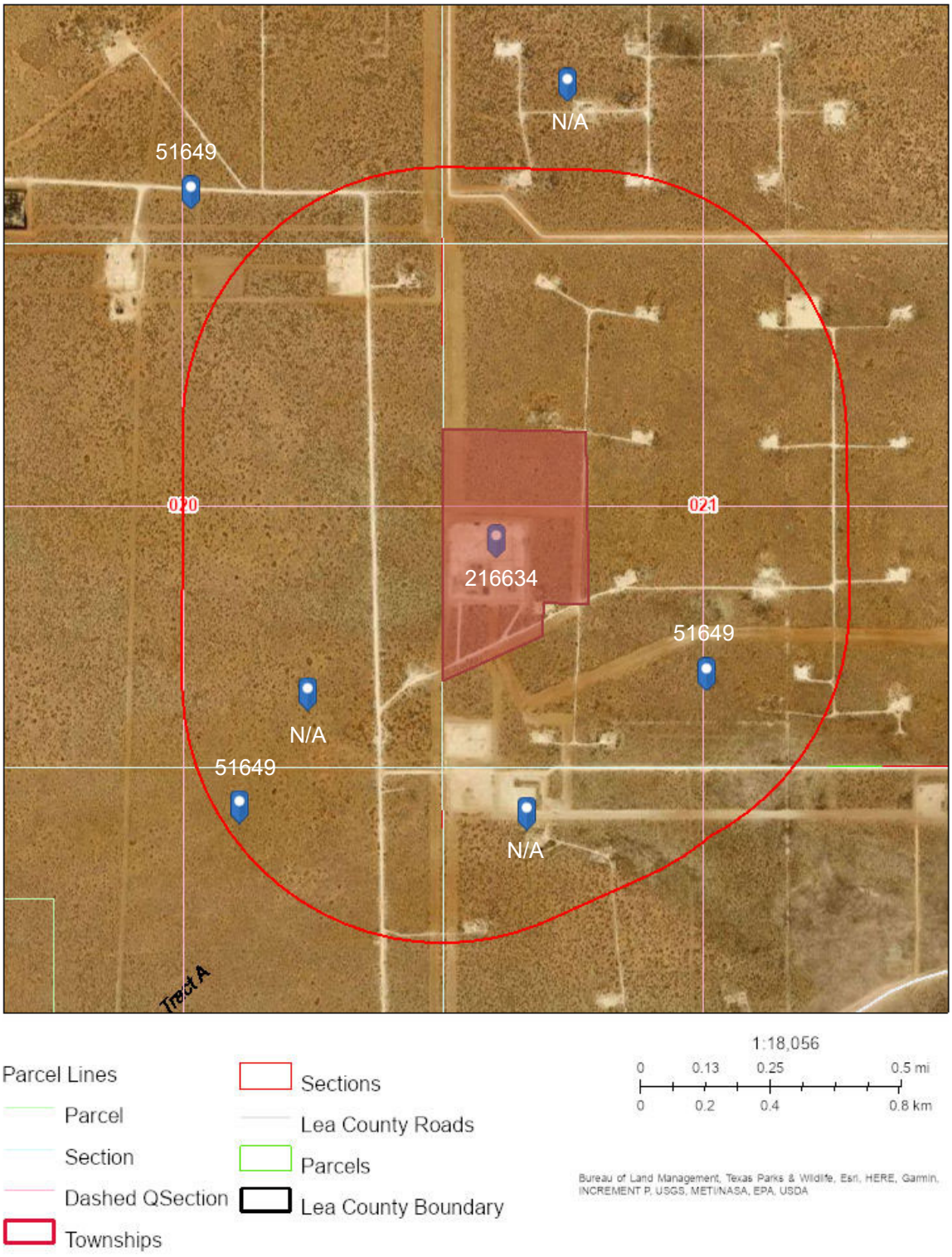
TRINITY CONSULTANTS
12700 PARK CENTRAL DR., STE. 600
DALLAS, TX 75251

Landowners within 0.5 miles of Facility

Area of Interest (AOI) Information

Area : 1.6 mi²

Nov 27 2023 15:22:52 Mountain Standard Time



Parcels

#	Owner #	Parcel Code	Name	In Care of Name	Mailing Address 1
1	51649	4000516490011	NGL SOUTH RANCH INC	KE ANDREWS %	2424 RIDGE RD
2		*N/A*	*N/A*	*N/A*	*N/A*
3	216634	4000516490005	NORTHWIND MIDSTREAM PARTNERS LLC	*N/A*	825 TOWN AND COUNTRY LN
4	51649	4000516490012	NGL SOUTH RANCH INC	KE ANDREWS %	2424 RIDGE RD
5		*N/A*	*N/A*	*N/A*	*N/A*
6		*N/A*	*N/A*	*N/A*	*N/A*
7	51649	4930721083029	NGL SOUTH RANCH INC	KE ANDREWS %	2424 RIDGE RD

#	Mailing Address 2	Mailing City	Mailing State	Country Name	Mailing Zipcode	Mailing Zipcode Extension	Area(mi²)
1	*N/A*	ROCKWELL	TX	*N/A*	75087	5116	0.04
2	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	0.07
3	STE 700	HOUSTON	TX	*N/A*	77024	2326	0.11
4	*N/A*	ROCKWELL	TX	*N/A*	75087	5116	0.12
5	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	0.14
6	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	0.48
7	*N/A*	ROCKWELL	TX	*N/A*	75087	5116	0.64

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.

Routine Operations:
Field gas enters the facility and condensed liquids are separated at the knock-out vessel. Liquids are sent to two 500 bbl storage tanks (T-800 & T-801) where it is stored. The inlet gas is compressed in three natural gas compressors (ENG-2, ENG-3, & ENG-5) as needed to achieve required operating pressure and for pipeline transport off-site. After compression, the inlet gas is sent to an amine treatment and regeneration unit (AM-1) which uses methyl diethanolamine (MDEA) to remove acid gases carbon dioxide (CO_2) and hydrogen sulfide (H_2S) from the gas stream. The amine treater includes a hot oil loop and a reboiler (AR-1) providing heat to the regeneration column. Wet fuel gas from the amine system is used as fuel in the AR-1 reboiler. The acid gas stream from the amine unit regeneration column flash tank, rich in H_2S and CO_2, I sent to the AGI system for underground disposal.

Sweet wet gas from the amine unit is sent to a glycol dehydration unit (DHY-1). The glycol unit includes a gas-fired reboiler (GR-1) for supplying heat to the system. Wet fuel gas from the amine system is used as fuel for GR-1 reboiler. The emissions from the glycol unit flash tank and regeneration column are controlled by a condenser and remaining emissions are routed to the GR-1 reboiler for combustion and control. Liquids from compressor interstage knockout and other knock-out vessels are sent to the T-800 & T-801 storage tanks. An intermediate flash vessel, upstream of the tanks, reduces potential flashing emissions from the tanks. The gas from the intermediate flash vessel is routed to the main process flare (F-7005), which also controls SSM gas streams in case of a failure of the existing process equipment. Wet fuel gas from the amine system is used as fuel in the F-7005 flare supplemented by pipeline quality natural gas as necessary. Emissions from the T-800 & T-801 storage tanks are controlled by another flare (F-400). This flare uses fuel gas generated in the process, supplemented by pipeline quality natural gas as necessary. A natural gas generator engine (GEN-1) provides power for site equipment besides the AGI system.

The AGI system uses two electric compressors for acid gas injection to the underground acid gas well. Normally, one electric compressor will run at any time. The compressors will be powered by four temporary fuel gas fired generators (GEN-2 through GEN-5) until the site can be connected to the electrical grid, which is expected within six months of start of operation. During routine operation, the electric compressors will be powered by two out of the four generators operating at approximately 60% load. At times, when compressor load balancing is necessary, the compressors will be swapped in operation. During the swap, the residual acid gas vapors trapped in the line between the compressors will be vented and combusted in a thermal oxidizer (TO-1). The TO-1 will always be operated in idle mode (except during shutdown of the plant), in order to be ready to accept the low heat content acid gases vented to the unit and to ensure adequate combustion of the acid gas. The TO-1 thermal oxidizer will use fuel gas generated at the site for combustion.

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)**:**
Please refer to Table 2-A.

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):

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.**

This application is for an NSR Significant modification

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/

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
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 emissions 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	Yes	AR-1	This facility has existing gas burning equipment having a heat input of greater than 1,000,000 million British Thermal Units per year per unit
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.
20.2.35 NMAC	Natural Gas Processing Plant – Sulfur	Yes	AM-1, AR-1	This regulation could apply to existing (prior to July 1, 1974) or new (on or after July 1, 1974) natural gas processing plants that use a Sulfur Recovery Unit to reduce sulfur emissions.
20.2.37 and 20.2.36 NMAC	Petroleum Processing Facilities and Petroleum Refineries	No	N/A	This facility is not a “Petroleum Refinery” as defined in this subpart.
20.2.38 NMAC	Hydrocarbon Storage Facility	No	N/A	20.2.38 NMAC specifies requirements for the storage of hydrocarbons in vessels with a capacity of at least 20,000 gallons. There are not any storage tanks at Northwind Midstream Partners Titan Treater Plant #1 that meet the applicability criteria of this regulation; therefore, this regulation does not apply.
20.2.39 NMAC	Sulfur Recovery Plant - Sulfur	No	N/A	This facility is not a sulfur recovery plant; therefore, this this regulation does not apply.
20.2.50 NMAC	Oil and Gas Sector – Ozone Precursor Pollutants	Yes		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: ☒113 – Engines and Turbines ☒114 – Compressor Seals ☐115 – Control Devices and Closed Vent Systems ☒116 – Equipment Leaks and Fugitive Emissions ☐ 117 – Natural Gas Well Liquid Unloading ☐ 118 – Glycol Dehydrators ☒ 119 – Heaters ☐ 120 – Hydrocarbon Liquid Transfers ☐121 – Pig Launching and Receiving ☐122 – Pneumatic Controllers and Pumps ☐ 123 – Storage Vessels ☐124 – Well Workovers ☐ 125 – Small Business Facilities ☐126 – Produced Water Management Unit ☐127 – Flowback Vessels and Preproduction Operations

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.)
				113 – ENG-2, ENG-3, & ENG-5 are spark ignition engines and will be subject to this subpart. 114 - Northwind Midstream Partners, LLC will comply with the applicable requirements of this subpart. 115 - The control devices and closed vent systems at this facility are not used to comply with this rule; therefore, they are not subject to the requirements of this rule. 116 - Northwind Midstream Partners, LLC will comply with the applicable requirements of this subpart. 118 - DHY-1 has a PTE is less than 2 tpy of VOC; therefore, this subpart does not apply 119 - The reboiler has a heat input greater than 20 MMBtu/hr; therefore, AR-1 will be subject to this subpart. 123 - The storage vessels have a PTE less than 2 tpy; therefore, this subpart does not apply.
20.2.61.109 NMAC	Smoke & Visible Emissions	Yes	ENG-2, ENG-3, ENG-5, GEN-1 through GEN-5, F-7005, F-Temp, F-400	Stationary Combustion Equipment, such as engines, boilers, heaters, and flares, subject to this regulation. Compressor engines (Unit ENG-2, ENG-3, & ENG-5), generators (GEN-1 through GEN-5), and flare (Units F-7005, F-Temp, F-400) will be subject to this regulation.
20.2.70 NMAC	Operating Permits	No	Facility	This facility is not a major source therefore this subpart does not apply.
20.2.71 NMAC	Operating Permit Fees	No	Facility	The facility is not subject to 20.2.70 NMAC, therefore this regulation does not apply.
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	No	Facility	This facility is not a Title V Major source.
20.2.74 NMAC	Permits – Prevention of Significant Deterioration (PSD)	No	Facility	This 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	Units subject to 40 CFR 60: ENG-2, ENG-3, ENG-5, GEN-1 through GEN-5,	This is a stationary source which is subject to the requirements of 40 CFR Part 60.

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.)
			FUG-1, FUG-2	
20.2.78 NMAC	Emission Standards for HAPS	No	Units Subject to 40 CFR 61: N/A	This facility emits hazardous air pollutants which are subject to the requirements of 40 CFR Part 61. However, there are no units subject to 40 CFR Part 61; therefore, this regulation does not apply.
20.2.79 NMAC	Permits – Nonattainment Areas	No	Facility	This facility is not located in a nonattainment area; therefore, this regulation does not apply.
20.2.80 NMAC	Stack Heights	No	Facility	This regulation establishes requirements for the evaluation of stack heights and other dispersion techniques. This regulation does not apply as a modeling waiver form was submitted.
20.2.82 NMAC	MACT Standards for source categories of HAPS	Yes	Units Subject to 40 CFR 63: ENG-2, ENG-3, ENG-5, GEN-1 through GEN-5, DHY-1	This regulation applies to all sources emitting hazardous air pollutants, which are subject to the requirements of 40 CFR Part 63.

Table for Applicable Federal Regulations:

Federal Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification:
40 CFR 50	NAAQS	Yes	Facility	If subject, this would normally apply to the entire facility. This applies if you are subject to 20.2.70, 20.2.72, 20.2.74, and/or 20.2.79 NMAC.
NSPS 40 CFR 60, Subpart A	General Provisions	Yes	Units subject to 40 CFR 60 Facility	Applies if any other Subpart in 40 CFR 60 applies.
NSPS 40 CFR60.40a, Subpart Da	Subpart Da, Performance Standards for **Electric Utility Steam Generating Units**	No	N/A	Not applicable as there are no steam generating units at this facility.

Federal Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification:
NSPS 40 CFR60.40b Subpart Db	**Electric Utility Steam Generating Units**	No	N/A	Not applicable as there are no electric utility steam generating units at this facility.
40 CFR 60.40c, Subpart Dc	Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units	No	N/A	Not applicable as there are no small industrial commercial institutional steam generating units at this facility.
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	No	N/A	Not applicable as tanks at this facility are below the applicable capacity thresholds.
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	N/A	Not applicable as the tanks at this facility are below the applicable capacity thresholds.
NSPS 40 CFR 60.330 Subpart GG	**Stationary Gas Turbines**	No	N/A	Not applicable as there are no turbines at this facility.
NSPS 40 CFR 60, Subpart KKK	Leaks of VOC from **Onshore Gas Plants**	No	N/A	The facility was constructed after the applicability date of 40 CFR 60 Subpart KKK (August 23, 2011).
NSPS 40 CFR Part 60 Subpart LLL	Standards of Performance for **Onshore Natural Gas Processing**: SO_2 Emissions	No	N/A	The facility was constructed after the applicability date of 40 CFR 60 Subpart KKK (August 23, 2011).

Federal Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification:
NSPS 40 CFR Part 60 Subpart OOOO	Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution for which construction, modification or reconstruction commenced **after** August 23, 2011 and **before** September 18, 2015	No	N/A	This regulation is applicable to onshore affected facilities listed in paragraphs (a) through (g) of this section constructed after August 23, 2011, and on or before September 18, 2015. The facility is not subject to this regulation.
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	No	ENG-2, ENG-3, ENG-5, FUG-1, FUG-2	The tanks have a PTE less than 6 tpy; therefore, they are no subject to this regulation. The collection of fugitives at this facility are subject to this subpart. The reciprocating compressors associated with ENG-2, ENG-3, & ENG-5 are subject pursuant to 60.5365a(c), therefore FUG-1, FUG-2, ENG-2, ENG-3, & ENG-5 are subject to this regulation.
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** December 6, 2022	Yes	ENG-2, ENG-5	This regulation is applicable to onshore affected facilities listed in paragraphs (a) through (l) of this section constructed **after** December 6, 2022. The reciprocating compressors associated with ENG-2 and ENG-5 are subject to the requirements of this subpart once the rule has been promulgated.
NSPS 40 CFR Part 60 Subpart OOOOc	Emissions Guidelines for Greenhouse Gas Emissions from Existing Crude Oil and Natural Gas Facilities	Yes	ENG-2, ENG-3, ENG-5, T-800, T-801, FUG-1, FUG-2	This subpart is applicable to onshore designated facilities listed in paragraphs (a) through (l) of this subpart in which construction, modification, or reconstruction commenced **on** or **before** December 6, 2022. The engines (ENG-2, ENG-3, and ENG-5), storage tanks (T-800 and T-801), and the facility fugitives (FUG-1 and FUG-2) are all subject to this subpart once the rule has been promulgated.
NSPS 40 CFR 60 Subpart IIII	Standards of performance for Stationary Compression Ignition Internal Combustion Engines	No	N/A	The engines located at this facility are SI engines; therefore, this subpart does not apply.
NSPS 40 CFR Part 60 Subpart JJJJ	Standards of Performance for Stationary Spark Ignition Internal	Yes	ENG-2, ENG-3, ENG-5, GEN-1	According to the 40 CFR §60.4230 (a)(4), spark ignition reciprocating internal combustion engines commencing construction, modification, or reconstruction after June 12, 2006, are subject to these standards. Further, engines with a maximum engine power greater than or equal to 500 hp manufactured after July

Federal Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification:
	Combustion Engines		through GEN-5	1, 2007 are subject to the standards. Engines (Units ENG-2, ENG-3, ENG-5, and GEN-1 through GEN-5) will comply with this rule.
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; therefore, the facility is 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	The 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 subpart.
NESHAP 40 CFR 61 Subpart A	General Provisions	No	N/A	The 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. Therefore, this subpart does not apply.
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	Facility	Applies if any other Subpart in 40 CFR 63 applies.
MACT 40 CFR 63.760 Subpart HH	**Oil and Natural Gas Production Facilities**	Yes	DHY-1	This regulation establishes national emission standards for hazardous air pollutants from oil and natural gas facilities. The facility is an area source of HAPs and this regulation applies to TEG units at area sources pursuant to 40 CFR 63.760(b)(2). DEHY-1 will meet the requirements of this subpart as applicable. Since benzene emissions are less than 1 tpy, the facility is subject to only recordkeeping requirements.
MACT 40 CFR 63 Subpart HHH		No	N/A	This facility is not a natural gas transmission facility; therefore, this facility is not subject to this regulation.
MACT 40 CFR 63 Subpart DDDDD	National Emission Standards for Hazardous Air Pollutants for Major Industrial, Commercial, and Institutional	No	N/A	This facility is not a major source of HAPs, nor does it contain an affected unit; therefore, this regulation does not apply.

Federal Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification:
	Boilers & Process Heaters			
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	ENG-2, ENG-3, ENG-5, GEN-1 through GEN-5	The engines at this facility are subject to MACT ZZZZ and will comply with this regulation by meeting the requirements of NSPS JJJJ.
40 CFR 64	**Compliance Assurance Monitoring**	No	N/A	Not applicable as facility has no units meeting the criteria of this part; therefore, this regulation does not apply.
40 CFR 68	**Chemical Accident Prevention**	No	N/A	This facility does not have any sources listed in this subpart.
Title IV – Acid Rain 40 CFR 72	**Acid Rain**	No	N/A	Not applicable as this facility is not an acid rain source.
Title IV – Acid Rain 40 CFR 73	**Sulfur Dioxide** Allowance Emissions	No	N/A	Not applicable as this facility is not an acid rain source.
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**	No	N/A	Not applicable as this facility is not an acid raid source.

Federal Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification:
	Reduction Program			
Title VI – 40 CFR 82	Protection of **Stratospheric Ozone**	No	N/A	Not Applicable as the facility does not service, maintain, repair class I or class II appliances nor disposes of the appliances.

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 Northwind's experience with specific equipment. These procedures are designed to proactively address the potential for malfunction to the greatest extent possible. These procedures dictate a sequence of operations that are designed 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, Northwind 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.

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.

During swapping of acid gas compressors, the acid gas in line between the compressors will be routed to and combusted in the Thermal Oxidizer (TO-1). The emissions from this scenario have been included in the site wide emission calculations.

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.

Daniel Dolce

From: Mustafa, Sufi A., ENV <sufi.mustafa@env.nm.gov>
Sent: Wednesday, November 29, 2023 4:15 PM
To: Adam Erenstein
Subject: RE: [EXTERNAL] FW: Modeling Waiver - Titan Treater Plant #1, NSR # 7747-M4R1
Attachments: 7747M4_Northwind Titan_Modeling Waiver Form_1120-2023.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Adam
I approved your request.
Thank you.

Sufi A. Mustafa, Ph.D.
Manager Air Dispersion Modeling and Emission Inventory Section
New Mexico Environment Department's Air Quality Bureau
Office: (505) 629 6186
sufi.mustafa@state.nm.us
525 Camino de los Marquez
Suite 1
Santa Fe, New Mexico, 87505
https://www.env.nm.gov/air-quality/

"Innovation, Science, Collaboration, Compliance"

From: Adam Erenstein <AErenstein@trinityconsultants.com>
Sent: Wednesday, November 29, 2023 2:34 PM
To: Mustafa, Sufi A., ENV <sufi.mustafa@env.nm.gov>
Subject: [EXTERNAL] FW: Modeling Waiver - Titan Treater Plant #1, NSR # 7747-M4R1

Sufi,
Just wanted to check in on this waiver to see if you had any questions? We are hoping to submit this application next week. Please contact me if you need any other information.

Regards,

Adam Erenstein
Principal Consultant, Manager of Consulting Services

P 505.266.6611 M 480.760.3860
NEW ADDRESS: 9400 Holly Avenue NE, Building 3, Suite B, Albuquerque, NM 87122
Email: aerenstein@trinityconsultants.com

New Mexico Environment Department
Air Quality Bureau
Modeling Section
525 Camino de Los Marquez - Suite 1
Santa Fe, NM 87505

Phone: (505) 476-4300
Fax: (505) 476-4375
www.env.nm.gov/air-quality/

For Department use only:

Approved by: Sufi A Mustafa

Date: 11/29/2023

Air Dispersion Modeling Waiver Request Form

This form must be completed and submitted with all air dispersion modeling waiver requests.

If an air permit application requires air dispersion modeling, in some cases the demonstration that ambient air quality standards and Prevention of Significant Deterioration (PSD) increments will not be violated can be satisfied with a discussion of previous modeling. The purpose of this form is to document and streamline requests to certify that previous modeling satisfies all or some of the current modeling requirements. The criteria for requesting and approving modeling waivers are found in the Air Quality Bureau Modeling Guidelines. Typically, only construction permit applications submitted per 20.2.72, 20.2.74, or 20.2.79 NMAC require air dispersion modeling. However, modeling is sometimes also required for a Title V permit application.

A waiver may be requested by e-mailing this completed form in **MS Word** format to the modeling manager, sufi.mustafa@env.nm.gov.

This modeling waiver is not valid if the emission rates in the application are higher than those listed in the approved waiver request.

Section 1 and Table 1: Contact and facility information:

Contact name	Adam Erenstein
E-mail Address:	aerenstein@trinityconsultants.com
Phone	(505) 266-6611
Facility Name	Titan Treater Plant #1
Air Quality Permit Number(s)	7747-M4R1
Agency Interest Number (if known)	35-025-1395
Latitude and longitude of facility (decimal degrees)	32.025581, -103.276567

General Comments: (Add introductory remarks or comments here, including the purpose of and type of permit application.)

The Titan Treater Plant #1 facility is owned and operated by Northwind Midstream Partners, LLC. The facility is located in Lea County, New Mexico. The facility is currently authorized to operate under NSR Permit No. 7747-M4R1. The Titan Plant receives sour natural gas from pipelines and treats it to remove acid gas (CO_2 and H_2S) and water. The treated gas is compressed and sent-off site via pipeline.

Northwind Midstream is proposing to add a new G3516B engine. No other changes are being proposed.

The last technical revision removed ENG-1, ENG-2 (old unit ENG-2, Caterpillar G3516B), and ENG-4 and added one 3616 engine. A modeling waiver was approved in July 2023 for this Technical Revision. In this application, Northwind Midstream is proposing to add a new G3516B engine (new unit ENG-2). No other changes are being proposed.

The new ENG-2 will be considered as a replacement unit for the old ENG-2. The location of the new ENG-2 will be the same as the old ENG-2. The stack parameters of this new ENG-2 will be updated as compared to the parameters of the old ENG-2. The tables below present the parameter changes of old and new ENG-2 units.

Old ENG-2 Unit - Caterpillar G3516B

Stack Type	Unit Number	Orientation	Height Above Ground	Temp.	Velocity	Inside Diameter
			ft	F	ft/sec	ft
Engine	ENG-2	Vertical	30.0	1019	126.6	1.20

New ENG-2 Unit - Caterpillar G3516B

Stack Type	Unit Number	Orientation	Height Above Ground	Temp.	Velocity	Inside Diameter
			ft	F	ft/sec	ft
Engine	ENG-2	Vertical	30.4	1019	134.08	1.17

The table below presents the emission rates of the old (removed) and new engine (new/replacement) Units ENG-2.

Unit No.	NOx		CO		VOC		SOx		PM10		PM2.5	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
ENG-2 (new)	1.52	6.66	1.80	7.86	1.76	7.73	5.80E-03	0.025	0.099	0.43	0.099	0.43
ENG-2 (old)	1.52	6.65	0.43	1.89	0.52	2.29	5.95E-03	0.030	0.10	0.44	0.10	0.44

Section 2 – List All Regulated Pollutants from the Entire Facility - Required

In Table 2, below, list all regulated air pollutants emitted from your facility, except for New Mexico Toxic Air Pollutants, which are listed in Table 6 of this form. All pollutants emitted from the facility must be listed whether or not a modeling waiver is requested for that pollutant or if the pollutant emission rate is subject to the proposed permit changes.

Table 2: Air Pollutant summary table (Check all that apply. Include all pollutants emitted by the facility):

Pollutant	Pollutant is not emitted at the facility and modeling or waiver are not required.	Pollutant does not increase in emission rate at any emission unit (based on levels currently in the permit) and stack parameters are unchanged. Modeling or waiver are not required.	Stack parameters or stack location has changed.	Pollutant is new to the permit, but already emitted at the facility.	Pollutant is increased at any emission unit (based on levels currently in the permit).	A modeling waiver is being requested for this pollutant.	Modeling for this pollutant will be included in the permit application.
CO			X			X	
NO_2			X			X	
SO_2			X			X	
PM10			X			X	
PM2.5			X			X	
H_2S		X					
Reduced S	X						

O_3 (PSD only)	X						
Pb	X						

Section 3: Pollutants, other than NMTAPs, with very small emission rates

The Air Quality Bureau has performed generic modeling to demonstrate that small sources, as listed in Appendix 2 of this form, do not need computer modeling. This modeling compared emissions from a project (the increase in emissions from the previous permit or total facility emissions for a new facility) with significance levels. After comparing the project's emission rates for various pollutants to Appendix 2, list in Table 3 the pollutants that do not need to be modeled because of very small emission rates.

The facility must be at least 2 km from the nearest Class I area to qualify for a waiver due to very small emission rates. List the nearest Class I area and the distance from the facility in Section 3 comments.

Section 3 Comments. (If you are not requesting a waiver for any pollutants based on their low emission rate, then note that here. You do not need to complete the rest of Section 3 or Table 3.)
<Add comments here>

Table 3: List of Pollutants with very small emission rates from the project

Pollutant	Requested Allowable Emission Rate for Project (pounds/hour)	Release Type (select "all from stacks >20 ft" or "other")	Waiver Threshold (from appendix 2) (lb/hr)
CO	1.52	all from stacks >20 ft	16.037
SO_2	0.0058	all from stacks >20 ft	0.179
PM_{10}	0.099	all from stacks >20 ft	0.255

Section 4: Pollutants that have previously been modeled at equal or higher emission rates
List the pollutants and averaging periods in Table 4 for which you are requesting a modeling waiver based on previous modeling for this facility. The previous modeling reports that apply to the pollutant must be submitted with the modeling waiver request. Request previous modeling reports from the Modeling Section of the Air Quality Bureau if you do not have them and believe they exist in the AQB modeling file archive.

Section 4 Comments. (If you are not asking for a waiver based on previously modeled pollutants, note that here. You do not need to complete the rest of section 4 or table 4.)
<Add comments here>

Table 4: List of previously modeled pollutants (facility-wide emission rates)

Pollutant	Averaging period	Proposed emission rate (pounds/hour)	Previously modeled emission rate (pounds/hour)	Proposed minus modeled emissions (lb/hr)	Modeled percent of standard or increment	Year modeled
NO_2	1-hr NAAQS	52.69	56.43	-3.74	88.29%	2019
NO_2	Annual NMAAQS	52.69	56.43	-3.74	13.16%	2019
NO_2	Annual Class II	52.69	56.43	-3.74	72.00%	2019
CO	1-hr SIL	96.45	94.80	+1.65	22.08%	2019
CO	8-hr SIL	96.45	94.80	+1.65	25.20%	2019
SO_2	1-hr NAAQS	6,345.32	6,345.30	+0.020	99.80%	2019
SO_2	3-hr NAAQS	6,345.32	6,345.30	+0.020	13.50%	2019
SO_2	3-hr Class II	6,345.32	6,345.30	+0.020	34.50%	2019

SO_2	24-hr NMAAQS	6,345.32	6,345.30	+0.020	34.00%	2019
SO_2	24-hr Class II	6,345.32	6,345.30	+0.020	98.00%	2019
SO_2	Annual NMAAQS	6,345.32	6,345.30	+0.020	13.10%	2019
SO_2	Annual Class II	6,345.32	6,345.30	+0.020	34.40%	2019
PM_{10}	24-hr SIL	2.05	2.02	+0.030	20.8%	2019
PM_{10}	Annual SIL	2.05	2.02	+0.030	5.00%	2019
$PM_{2.5}$	24-hr SIL	2.05	2.02	+0.030	86.67%	2019
$PM_{2.5}$	Annual SIL	2.05	2.02	+0.030	25.00%	2019
H_2S	1-hr SIL	7.67	7.67	0	4.80%	2019

Section 4, Table 5: Questions about previous modeling:

Question	Yes	No
Was AERMOD used to model the facility?	X	
Did previous modeling predict concentrations less than 95% of each air quality standard and PSD increment?		X
Were all averaging periods modeled that apply to the pollutants listed above?	X	
Were all applicable startup/shutdown/maintenance scenarios modeled?	X	
Did modeling include all sources within 1000 meters of the facility fence line that now exist?	X	
Did modeling include background concentrations at least as high as current background concentrations?	X	
If a source is changing or being replaced, is the following equation true for all pollutants for which the waiver is requested? (Attach calculations if applicable.) EXISTING SOURCE REPLACMENT SOURCE $\frac{[(g) \times (h1)] + [(v1)^2/2] + [(c) \times (T1)]}{q1} \leq \frac{[(g) \times (h2)] + [(v2)^2/2] + [(c) \times (T2)]}{q2}$ Where g = gravitational constant = 32.2 ft/sec^2 h1 = existing stack height, feet v1 = exhaust velocity, existing source, feet per second c = specific heat of exhaust, 0.28 BTU/lb-degree F T1 = absolute temperature of exhaust, existing source = degree F + 460 q1 = emission rate, existing source, lbs/hour h2 = replacement stack height, feet v2 = exhaust velocity, replacement source, feet per second T2 = absolute temperature of exhaust, replacement source = degree F + 460 q2 = emission rate, replacement source, lbs/hour		N/A

If you checked "no" for any of the questions, provide an explanation for why you think the previous modeling may still be used to demonstrate compliance with current ambient air quality standards.

Northwind Midstream is proposing to add one (1) new G3516B engine. Previous modeling predicted concentrations greater than 95% for the 1-hr SO_2 NAAQS and SO_2 24-hr PSD Class II increment standards. However, the SO_2 emission of this project is below the very small emission rate threshold for SO_2.

Section 5: Modeling waiver using scaled emission rates and scaled concentrations

At times it may be possible to scale the results of modeling one pollutant and apply that to another pollutant. Increases in emissions of one pollutant might also demonstrate compliance by applying a scaling factor to the modeling results. If the analysis for the waiver gets too complicated, then it becomes a modeling review rather than a modeling waiver, and applicable modeling fees will be charged for the modeling. Plume depletion, ozone chemical reaction modeling, post-processing, and unequal pollutant ratios from different sources are likely to invalidate scaling.

Below are scaled percentages of ambient air quality standards and increments based on the previous modeling results and the proposed emission rates. The results of the analysis show that modeling is not required as the proposed emission rates will not significantly increase the ambient air quality impacts from the facility.

Pollutant	Averaging period	Proposed emission rate (pounds/hour)	Previously modeled emission rate (pounds/hour)	Scaled Impact* (% of standard)	Modeled percent of standard or increment	Year modeled
NO_2	1-hr NAAQS	52.69	56.43	82.44%	88.29%	2019
NO_2	Annual NMAAQS	52.69	56.43	12.29%	13.16%	2019
NO_2	Annual Class II	52.69	56.43	67.23%	72.00%	2019
CO	1-hr SIL	96.45	94.80	22.46%	22.08%	2019
CO	8-hr SIL	96.45	94.80	25.64%	25.20%	2019
SO_2	1-hr NAAQS	6,345.32	6,345.30	99.80%	99.80%	2019
SO_2	3-hr NAAQS	6,345.32	6,345.30	13.50%	13.50%	2019
SO_2	3-hr Class II	6,345.32	6,345.30	34.50%	34.50%	2019
SO_2	24-hr NMAAQS	6,345.32	6,345.30	34.00%	34.00%	2019
SO_2	24-hr Class II	6,345.32	6,345.30	98.00%	98.00%	2019
SO_2	Annual NMAAQS	6,345.32	6,345.30	13.10%	13.10%	2019
SO_2	Annual Class II	6,345.32	6,345.30	34.40%	34.40%	2019
PM_{10}	24-hr SIL	2.05	2.02	21.11%	20.80%	2019
PM_{10}	Annual SIL	2.05	2.02	5.07%	5.00%	2019
$PM_{2.5}$	24-hr SIL	2.05	2.02	87.96%	86.67%	2019
$PM_{2.5}$	Annual SIL	2.05	2.02	25.37%	25.00%	2019
H_2S	1-hr SIL	7.67	7.67	4.80%	4.80%	2019

*Scaled Percent of Standard=Proposed Emission Rate (lb/hr) / Modeled Emission Rate (lb/hr) x Modeled Percent of Standard

If you are not scaling previous results, note that here. You do not need to complete the rest of section 5. Scaling analyses are not intended to be used for previously modeled pollutants with decreasing emissions, which is already addressed in section 4.

To demonstrate compliance with standards for a pollutant describe scenarios below that you wish the modeling section to consider for scaling results.

N/A

Section 6: New Mexico Toxic air pollutants – 20.2.72.400 NMAC

Modeling must be provided for any New Mexico Toxic Air Pollutant (NMTAP) with a facility-wide controlled emission rate in excess of the pound per hour emission levels specified in Tables A and B at **20.2.72.502 NMAC** - Toxic Air Pollutants and Emissions. An applicant may use a stack height correction factor based on the release height of the stack for the purpose of determining whether modeling is required. See Table C - Stack Height Correction Factor at 20.2.72.502 NMAC. Divide the emission rate for each release point of a NMTAP by the correction factor for that release height and add the total values together to determine the total adjusted pound per hour emission rate for that NMTAP. If the total adjusted pound per hour emission rate is lower than the emission rate screening level found in Tables A and B, then modeling is not required.

In Table 6, below, list the total facility-wide emission rates for each New Mexico Toxic Air Pollutant emitted by the facility. The table is pre-populated with common examples. Extra rows may be added for NMTAPS not listed or for NMTAPS emitted from multiple stack heights. NMTAPS not emitted at the facility may be deleted, left blank, or noted as 0 emission rate. Toxics previously modeled may be addressed in Section 5 of this waiver form. For convenience, we have listed the stack height correction factors in Appendix 1 of this form.

Section 6 Comments. (If you are not requesting a waiver for any NMTAPs then note that here. You do not need to complete the rest of section 6 or Table 6.)

N/A – Toxics modeling is not required for this facility.

Table 6: New Mexico Toxic Air Pollutants emitted at the facility

If requesting a waiver for any NMTAP, all NMTAPs from this facility must be listed in Table 3 regardless of if a modeling waiver is requested for that pollutant or if the pollutant emission rate is subject to the proposed permit changes.

Pollutant	Requested Allowable Emission Rate (pounds/hour)	Release Height (Meters)	Correction Factor	Allowable Emission Rate Divided by Correction Factor	Emission Rate Screening Level (pounds/hour)
Ammonia					1.20
Asphalt (petroleum) fumes					0.333
Carbon black					0.233
Chromium metal					0.0333
Glutaraldehyde					0.0467
Nickel Metal					0.0667
Wood dust (certain hard woods as beech & oak)					0.0667
Wood dust (soft wood)					0.333
(add additional toxics if they are present)					

Section 7: Approval or Disapproval of Modeling Waiver

The AQB air dispersion modeler should list each pollutant for which the modeling waiver is approved, the reasons why, and any other relevant information. If not approved, this area may be used to document that decision.

The added engine has equivalent or better dispersion parameters. The second engine addition is still keeping the NOx emissions from facility below what was modeled in the past. The scaled emissions show that expected concentrations of pollutants will either remain the same or decrease. CO is increasing in emissions and concentrations, but the scaled concentrations are much below AAQS.

Appendix 1: Stack Height Release Correction Factor (adapted from 20.2.72.502 NMAC)

Release Height in Meters	Correction Factor
0 to 9.9	1
10 to 19.9	5
20 to 29.9	19
30 to 39.9	41
40 to 49.9	71
50 to 59.9	108
60 to 69.9	152
70 to 79.9	202
80 to 89.9	255
90 to 99.9	317
100 to 109.9	378
110 to 119.9	451
120 to 129.9	533
130 to 139.9	617
140 to 149.9	690
150 to 159.9	781
160 to 169.9	837
170 to 179.9	902
180 to 189.9	1002
190 to 199.9	1066
200 or greater	1161

Appendix 2. Very small emission rate modeling waiver requirements (updated 7/27/2023)
Modeling is waived if emissions of a pollutant for the project are below the amount:

Pollutant	If all emissions come from stacks 20 feet or greater in height and there are no horizontal stacks or raincaps (lb/hr)	If not all emissions come from stacks 20 feet or greater in height, or there are horizontal stacks, raincaps, volume, or area sources (lb/hr)
CO	16.037	2.580
H_2S (Pecos-Permian Basin)	0.114	0.015
H_2S (Not in Pecos-Permian Basin)	0.022	0.003
Lead	0.005	0.001
NO_2	0.189	0.024
PM2.5 – Point Sources	0.056	0.009
PM2.5 – Volume Sources		0.003
PM10 – Point Sources	0.255	0.039
PM10 – Volume Sources		0.015
SO_2	0.179	0.023
Reduced sulfur (Pecos-Permian Basin)	0.033	No waiver
Reduced sulfur (Not in Pecos-Permian Basin)	No waiver	No waiver

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
1,2	Tested in accordance with EPA test methods for NOx and CO as required by Title V permit P500.	4/13/2004
3	Tested in accordance with EPA test methods for NOx and CO as required by NSR permit 2923M1.	5/12/2005

Section 20

Other Relevant Information

Other relevant information. Use this attachment to clarify any part in the application that you think needs explaining. Reference the section, table, column, and/or field. Include any additional text, tables, calculations or clarifying information.

Additionally, the applicant may propose specific permit language for AQB consideration. In the case of a revision to an existing permit, the applicant should provide the old language and the new language in track changes format to highlight the proposed changes. If proposing language for a new facility or language for a new unit, submit the proposed operating condition(s), along with the associated monitoring, recordkeeping, and reporting conditions. In either case, please limit the proposed language to the affected portion of the permit.

No other relevant information is being submitted as part of this application.

Section 22: Certification

Company Name: Northwind Midstream Partners LLC

I, Benjamin Ahiabor, 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 20th day of December, 2023, upon my oath or affirmation, before a notary of the State of Texas.

*Signature

12/20/2023
Date

Benjamin Ahiabor
Printed Name

Chief Operating Officer
Title

Scribed and sworn before me on this 20th day of December, 2023.

My authorization as a notary of the State of Texas expires on the 6th day of September, 2027.

Notary's Signature

12/20/23
Date

Anna Beltran
Notary's Printed Name

ANNA BELTRAN
Notary ID #134541619
My Commission Expires
September 6, 2027

*For Title V applications, the signature must be of the Responsible Official as defined in 20.2.70.7.AE NMAC.