March 4, 2025

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

RE: New Source Review Permit Application
Northwind Midstream Partners, LLC – Titan Treater Plant #2

Mr. Nellessen:

On behalf of Northwind Midstream Partners, LLC, PEI Consulting Group, Inc. (PEI) is submitting the attached application proposing construction of the Titan Treater Plant #2. Section 3 of the application provides details of the revisions. Should you have any questions, please contact me at etullos@pei-tx.com or Jillian Yamartino at jyamartino@nwmidstream.com.

Sincerely,
PEI Consulting Group, Inc.

Evan Tullos
Vice President

Enclosure

New Source Review Permit Application

NSR Permit No. To Be Assigned

Northwind Midstream Partners, LLC

Titan Treater Plant #2

Lea County, New Mexico

Prepared by:

PEI Consulting Group, Inc.

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.: 1377 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: **20.2.72.200.A(1) 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: TBD	Updating Permit/NOI #: NA
1	Facility Name: **Titan Treater Plant #2**	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: (281)800-2120 / N/A	

a	Plant Operator Address: 811 Louisiana St., Suite 2500; Houston, TX 77002	
b	Plant Operator's New Mexico Corporate ID or Tax ID: Unknown	
3	Plant Owner(s) name(s): Northwind Midstream Partners, LLC	Phone/Fax: (281)800-2120 / N/A
a	Plant Owner(s) Mailing Address(s): 811 Louisiana St., Suite 2500; Houston, TX 77002	
4	Bill To (Company): Northwind Midstream Partners, LLC	Phone/Fax: (281)800-2120 / N/A
a	Mailing Address: 811 Louisiana St., Suite 2500; Houston, TX 77002	E-mail: jyamartino@nwmidstream.com
5	☐ Preparer: ☒ Consultant: Evan Tullos	Phone/Fax: (865) 850-2007 / N/A
a	Mailing Address: 1414 W Sam Houston Pkwy N; Suite 160; Houston, TX 77043	E-mail: etullos@pei-tx.com
6	Plant Operator Contact: Reagan Register	Phone/Fax: (432) 203-5315 / N/A
a	Address: 600 N Marienfeld St., Suite 900 Midland, TX 79701	E-mail: rregister@nwmidstream.com
7	Air Permit Contact: Jillian Yamartino	Title: Environmental - Air Manager
a	E-mail: jyamartino@nwmidstream.com	Phone/Fax: (346) 613-1471 / N/A
b	Mailing Address: 811 Louisiana St., Suite 2500; Houston, TX 77002	
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: N/A
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: 9.2 MMscf/h (average)	Daily: 220 MMscfd	Annually: 80,300 MMscf/yr
b	Proposed	Hourly: 9.2 MMscf/h (average)	Daily: 220 MMscfd	Annually: 80,300 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: 9.2 MMscf/h (average)	Daily: 220 MMscfd	Annually: 80,300 MMscf/yr
b	Proposed	Hourly: 9.2 MMscf/h (average)	Daily: 220 MMscfd	Annually: 80,300 MMscf/yr

Section 1-D: Facility Location Information

1	Latitude (decimal degrees): 32.03270	Longitude (decimal degrees): -103.27470	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): 662,917	UTM N (in meters, to nearest 10 meters): 3,54362		
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 7.6 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 ~3.65 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): 104.6 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					

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 **A** ☒ <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.) Joshua Thomas (20.2.70.300.D.2 NMAC):		Phone: 214-679-4514
a	R.O. Title: SVP, Operations	R.O. e-mail: jthomas@nwmidstream.com	
b	R. O. Address: 811 Louisiana St. Suite 2500, Houston, TX 77002		
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: Evan Tullos, Email: etullos@pei-tx.com,

Phone Number: (865) 850-2007.

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.
CE-1	Compressor Engine 1	Caterpillar	G3606	TBD	2065 hp	2065 hp	TBD TBD	OxCat-1 CE-1	20200254	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	
CE-2	Compressor Engine 2	Caterpillar	G3606	TBD	2065 hp	2065 hp	TBD TBD	OxCat-2 CE-2	20200254	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	
CE-3	Compressor Engine 3	Caterpillar	G3606	TBD	2065 hp	2065 hp	TBD TBD	OxCat-3 CE-3	20200254	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	
CE-4	Compressor Engine 4	Caterpillar	G3606	TBD	2065 hp	2065 hp	TBD TBD	OxCat-4 CE-4	20200254	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	
CE-5	Compressor Engine 5	Caterpillar	G3606	TBD	2065 hp	2065 hp	TBD TBD	OxCat-5 CE-5	20200254	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	
CE-6	Compressor Engine 6	Caterpillar	G3606	TBD	2065 hp	2065 hp	TBD TBD	OxCat-6 CE-6	20200254	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	
CE-7	Compressor Engine 7	Caterpillar	G3606	TBD	2065 hp	2065 hp	TBD TBD	OxCat-7 CE-7	20200254	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	
CE-8	Compressor Engine 8	Caterpillar	G3516J	TBD	1380 hp	1380 hp	TBD TBD	OxCat-8 CE-8	20200254	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	
CE-9	Compressor Engine 9	Caterpillar	G3516J	TBD	1380 hp	1380 hp	TBD TBD	OxCat-9 CE-9	20200254	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	
CE-10	Compressor Engine 10	Caterpillar	G3516J	TBD	1380 hp	1380 hp	TBD TBD	OxCat-10 CE-10	20200254	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	
CE-11	Compressor Engine 11	Caterpillar	G3516J	TBD	1380 hp	1380 hp	TBD TBD	OxCat-11 CE-11	20200254	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	
CE-12	Compressor Engine 12	Caterpillar	G3516J	TBD	1380 hp	1380 hp	TBD TBD	OxCat-12 CE-12	20200254	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	
DHY-1	Glycol Dehydrator	Reset Energy	N/A	N/A	110 MMSCFD	110 MMSCFD	TBD TBD	VRU VRU	31000304	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
DHR-1	Glycol Reboiler	Reset Energy	N/A	N/A	1.1 MMBtu/hr	1.1 MMBtu/hr	TBD TBD	N/A DHR-1	31000228	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
DHY-2	Glycol Dehydrator	Reset Energy	N/A	N/A	110 MMSCFD	110 MMSCFD	TBD TBD	VRU VRU	31000304	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		

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.
DHR-2	Glycol Reboiler	Reset Energy	N/A	N/A	1.1 MMBtu/hr	1.1 MMBtu/hr	TBD TBD	N/A DHR-2	31000228	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FL-1	Main Flare Plant 2	Zeeco	N/A	N/A	TBD	TBD	TBD TBD	N/A FL-1	31000216	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-1	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		
AGFL-1	Acid Gas Flare	Zeeco	N/A	N/A	TBD	TBD	TBD TBD	N/A AGFL-1	31000216	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
LOAD-1	Slop Oil Load	N/A	N/A	N/A	446 BBL/day	446 BBL/day	TBD TBD	NA NA	40400250	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
LOAD-2	Condensate Loading	N/A	N/A	N/A	1,230,935 BBL/YR	1,230,935 BBL/YR	TBD TBD	VRU VRU	40400250	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
AGI-COMP1	AGI Compressors (Electric)	N/A	N/A	N/A	N/A	N/A	TBD TBD	N/A N/A	31088811	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
AGI-COMP2	AGI Compressors (Electric)	N/A	N/A	N/A	N/A	N/A	TBD TBD	N/A N/A	31088811	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
AGI-COMP3	AGI Compressors (Electric)	N/A	N/A	N/A	N/A	N/A	TBD TBD	N/A N/A	31088811	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
AGI-COMP4	AGI Compressors (Electric)	N/A	N/A	N/A	N/A	N/A	TBD TBD	N/A N/A	31088811	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
AGI-COMP5	AGI Compressors (Electric)	N/A	N/A	N/A	N/A	N/A	TBD TBD	N/A N/A	31088811	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
TK-1	Slop Water Tank	N/A	N/A	N/A	400 bbl	400 bbl	TBD TBD	VRU VRU	40400311	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
TK-2	Slop Water Tank	N/A	N/A	N/A	400 bbl	400 bbl	TBD TBD	VRU VRU	40400311	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
TK-3	Condensate Tank	N/A	N/A	N/A	1000 bbl	1000 bbl	TBD TBD	VRU VRU	40400311	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
TK-4	Condensate Tank	N/A	N/A	N/A	1000 bbl	1000 bbl	TBD TBD	VRU VRU	40400311	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
TK-5	Condensate Tank	N/A	N/A	N/A	1000 bbl	1000 bbl	TBD TBD	VRU VRU	40400311	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		

Unit Number[1]	Source Description	Make	Model #	Serial #	Manufact-urer'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 Classi-fication Code (SCC)	For Each Piece of Equipment, Check One	RICE Ignition Type (CI, SI, 4SLB, 4SRB, 2SLB)[4]	Replacing Unit No.
TK-6	Condensate Tank	N/A	N/A	N/A	1000 bbl	1000 bbl	TBD TBD	VRU VRU	40400311	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
TK-TRI	Spent Triazine Tank	N/A	N/A	N/A	400 bbl	400 bbl	TBD TBD	N/A N/A	40400311	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
LOADTRI	Triazine Loading	N/A	N/A	N/A	200 BBL/day	200 BBL/day	TBD TBD	N/A N/A	40400250	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
AM-1	Amine Unit	N/A	N/A	N/A	110 MMscfd	110 MMscfd	TBD TBD	AGFL-1 AGFL-1	31000305	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
AM-2	Amine Unit	N/A	N/A	N/A	110 MMscfd	110 MMscfd	TBD TBD	AGFL-1 AGFL-1	31000305	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
HOH-1	Hot Oil Heater for Amine Unit	N/A	N/A	N/A	110 MMBtu/hr	110 MMBtu/hr	TBD TBD	N/A HOH-1	31000404	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
HOH-2	Hot Oil Heater for Amine Unit	N/A	N/A	N/A	110 MMBtu/hr	110 MMBtu/hr	TBD TBD	N/A HOH-2	31000404	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
STABHR-1	Stabilizer Heater	N/A	N/A	N/A	15 MMBtu/hr	15 MMBtu/hr	TBD TBD	N/A STABHR-1	31000404	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
ROAD	Haul Roads	N/A	N/A	N/A	N/A	N/A	N/A N/A	N/A N/A	31088811	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
SOH-COMP1	Stabilizer Over Head Compressor (Electric)	N/A	N/A	N/A	N/A	N/A	N/A N/A	N/A N/A	31088811	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
SOH-COMP2	Stabilizer Over Head Compressor (Electric)	N/A	N/A	N/A	N/A	N/A	N/A N/A	N/A N/A	31088811	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
SOH-COMP3	Stabilizer Over Head Compressor (Electric)	N/A	N/A	N/A	N/A	N/A	N/A N/A	N/A N/A	31088811	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
TURB-1	Power Generating Turbine	Solar	T60	TBD	6370 HP	6370 HP	TBD TBD	N/A TURB-1	20200201	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
TURB-2	Power Generating Turbine	Solar	T60	TBD	6370 HP	6370 HP	TBD TBD	N/A TURB-2	20200201	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
TURB-3	Power Generating Turbine	Solar	T60	TBD	6370 HP	6370 HP	TBD TBD	N/A TURB-3	20200201	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		

Unit Number[1]	Source Description	Make	Model #	Serial #	Manufact-urer'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 Classi-fication Code (SCC)	For Each Piece of Equipment, Check One	RICE Ignition Type (CI, SI, 4SLB, 4SRB, 2SLB)[4]	Replacing Unit No.
TURB-4	Power Generating Turbine	Solar	T60	TBD	6370 HP	6370 HP	TBD / TBD	N/A / TURB-4	20200201	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
TURB-5	Power Generating Turbine	Solar	T60	TBD	6370 HP	6370 HP	TBD / TBD	N/A / TURB-5	20200201	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
TURB-6	Power Generating Turbine	Solar	T60	TBD	6370 HP	6370 HP	TBD / TBD	N/A / TURB-6	20200201	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		

[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. / Serial No.	Max Capacity / Capacity Units	List Specific 20.2.72.202 NMAC Exemption (e.g. 20.2.72.202.B.5) / Insignificant Activity citation (e.g. IA List Item #1.a)	Date of Manufacture /Reconstruction[2] / Date of Installation /Construction[2]	For Each Piece of Equipment, Check Onc
Small Tanks	Small tanks for storing glycol make-up, Amine make-up, lube oil, methanol	N/A	N/A N/A	55 gallons	20.2.72.202.B.2 NMAC N/A	Nov-18 Nov-18	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
TK-TRIAZINE	Triazene Tanks	N/A	N/A N/A	1000 barrels	20.2.72.202.B.2 NMAC N/A	TBD TBD	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
TK-47750	Water Tank	N/A	N/A N/A	500 barrels	20.2.72.202.B.2 NMAC N/A	TBD TBD	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
TK-47790	RO Water Tank	N/A	N/A N/A	500 barrels	20.2.72.202.B.2 NMAC N/A	TBD TBD	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
TK-47780	RO Wastewater Tank	N/A	N/A N/A	500 barrels	20.2.72.202.B.2 NMAC N/A	TBD TBD	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
TK-47800	Amine Storage Tank	N/A	N/A N/A	500 barrels	20.2.72.202.B.2 NMAC N/A	TBD TBD	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
TK-47825	TEG Storage Tank	N/A	N/A N/A	500 barrels	20.2.72.202.B.2 NMAC N/A	TBD TBD	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
TK-47025	Lube Oil Storage Tank	N/A	N/A N/A	500 barrels	20.2.72.202.B.2 NMAC N/A	TBD TBD	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
TK-47595	Lube Oil Storage Tank	N/A	N/A N/A	500 barrels	20.2.72.202.B.2 NMAC N/A	TBD TBD	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified 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-1	Oxidation Catalyst	TBD	CO, VOC, HAP	CE-1	CO: 88% VOC: 0% HCHO: 79%	Manufacturer
OxCat-2	Oxidation Catalyst	TBD	CO, VOC, HAP	CE-2	CO: 88% VOC: 0% HCHO: 79%	Manufacturer
OxCat-3	Oxidation Catalyst	TBD	CO, VOC, HAP	CE-3	CO: 88% VOC: 0% HCHO: 79%	Manufacturer
OxCat-4	Oxidation Catalyst	TBD	CO, VOC, HAP	CE-4	CO: 88% VOC: 0% HCHO: 79%	Manufacturer
OxCat-5	Oxidation Catalyst	TBD	CO, VOC, HAP	CE-5	CO: 88% VOC: 0% HCHO: 79%	Manufacturer
OxCat-6	Oxidation Catalyst	TBD	CO, VOC, HAP	CE-6	CO: 88% VOC: 0% HCHO: 79%	Manufacturer
OxCat-7	Oxidation Catalyst	TBD	CO, VOC, HAP	CE-7	CO: 88% VOC: 0% HCHO: 79%	Manufacturer
OxCat-8	Oxidation Catalyst	TBD	CO, VOC, HAP	CE-8	CO: 88% VOC: 42% HCHO: 86%	Manufacturer
OxCat-9	Oxidation Catalyst	TBD	CO, VOC, HAP	CE-9	CO: 88% VOC: 42% HCHO: 86%	Manufacturer
OxCat-10	Oxidation Catalyst	TBD	CO, VOC, HAP	CE-10	CO: 88% VOC: 42% HCHO: 86%	Manufacturer
OxCat-11	Oxidation Catalyst	TBD	CO, VOC, HAP	CE-11	CO: 88% VOC: 42% HCHO: 86%	Manufacturer
OxCat-12	Oxidation Catalyst	TBD	CO, VOC, HAP	CE-12	CO: 88% VOC: 42% HCHO: 86%	Manufacturer
FL-1	Process/SSM Flare	TBD	VOC, HAP, H2S	Drain system and various SSM gas streams	98%	Manufacturer
AGFL-1	Acid gas/SSM Flare	TBD	VOC, HAP, H2S	AGI-COMP1 to AGI-COMP5, AM-1, AM-2	98%	Manufacturer
AGI	Acid gas injection (underground)	N/A	H2S	AM-1, AM-2 (Regen Still Vent)	100%	Engineering Estimate
VRU1	Redundant Vapor Recovery Unit	TBD	VOC, HAP, H2S	TK-1 to TK-6, LOAD2, DHY-1, DHY-2	98% (uptime)	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		SO2		PM[1]		PM10		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
HOH-1	3.96	17.34	1.65	7.23	2.09	9.15	0.11	0.47	0.98	4.29	0.98	4.29	0.98	4.29	-	0.004	-	-
HOH-2	3.96	17.34	1.65	7.23	2.09	9.15	0.11	0.47	0.98	4.29	0.98	4.29	0.98	4.29	-	0.004	-	-
DHR-1	0.13	0.56	0.11	0.47	0.01	0.03	0.00	0.01	0.01	0.04	0.01	0.04	0.01	0.04	-	-	-	-
DHR-2	0.13	0.56	0.11	0.47	0.01	0.03	0.00	0.01	0.01	0.04	0.01	0.04	0.01	0.04	-	-	-	-
STABHR-1	0.55	2.42	0.57	2.48	0.10	0.42	0.01	0.06	0.13	0.59	0.13	0.59	0.13	0.59	-	-	-	-
CE-1	1.37	5.98	9.79	42.87	0.86	3.79	0.01	0.05	0.16	0.71	0.16	0.71	0.16	0.71	-	-	-	-
CE-2	1.37	5.98	9.79	42.87	0.86	3.79	0.01	0.05	0.16	0.71	0.16	0.71	0.16	0.71	-	-	-	-
CE-3	1.37	5.98	9.79	42.87	0.86	3.79	0.01	0.05	0.16	0.71	0.16	0.71	0.16	0.71	-	-	-	-
CE-4	1.37	5.98	9.79	42.87	0.86	3.79	0.01	0.05	0.16	0.71	0.16	0.71	0.16	0.71	-	-	-	-
CE-5	1.37	5.98	9.79	42.87	0.86	3.79	0.01	0.05	0.16	0.71	0.16	0.71	0.16	0.71	-	-	-	-
CE-6	1.37	5.98	9.79	42.87	0.86	3.79	0.01	0.05	0.16	0.71	0.16	0.71	0.16	0.71	-	-	-	-
CE-7	1.37	5.98	9.79	42.87	0.86	3.79	0.01	0.05	0.16	0.71	0.16	0.71	0.16	0.71	-	-	-	-
CE-8	1.52	6.66	6.15	26.92	1.31	5.73	0.01	0.03	0.11	0.49	0.11	0.49	0.11	0.49	-	-	-	-
CE-9	1.52	6.66	6.15	26.92	1.31	5.73	0.01	0.03	0.11	0.49	0.11	0.49	0.11	0.49	-	-	-	-
CE-10	1.52	6.66	6.15	26.92	1.31	5.73	0.01	0.03	0.11	0.49	0.11	0.49	0.11	0.49	-	-	-	-
CE-11	1.52	6.66	6.15	26.92	1.31	5.73	0.01	0.03	0.11	0.49	0.11	0.49	0.11	0.49	-	-	-	-
CE-12	1.52	6.66	6.15	26.92	1.31	5.73	0.01	0.03	0.11	0.49	0.11	0.49	0.11	0.49	-	-	-	-
TURB-1	2.97	13.03	3.51	15.39	1.74	7.63	0.00	0.01	0.34	1.49	0.34	1.49	0.34	1.49	-	-	-	-
TURB-2	2.97	13.03	3.51	15.39	1.74	7.63	0.00	0.01	0.34	1.49	0.34	1.49	0.34	1.49	-	-	-	-
TURB-3	2.97	13.03	3.51	15.39	1.74	7.63	0.00	0.01	0.34	1.49	0.34	1.49	0.34	1.49	-	-	-	-
TURB-4	2.97	13.03	3.51	15.39	1.74	7.63	0.00	0.01	0.34	1.49	0.34	1.49	0.34	1.49	-	-	-	-
TURB-5	2.97	13.03	3.51	15.39	1.74	7.63	0.00	0.01	0.34	1.49	0.34	1.49	0.34	1.49	-	-	-	-
TURB-6	Backup for TURB-1 to TUBR-5																	
FUG	-	-	-	-	14.50	63.49	-	-	-	-	-	-	-	-	0.61	2.68	-	-
AGFL-2 (Pilot)	0.30	1.31	1.19	5.20	0.01	0.03	-	-	0.01	0.06	0.01	0.06	0.01	0.06	-	-	-	-
FL-2 (Pilot)	1.30	5.68	2.59	11.35	0.05	0.22	-	-	0.06	0.25	0.06	0.25	0.06	0.25	-	-	-	-
DHY-1 SSM	-	-	-	-	49.77	218.00	-	-	-	-	-	-	-	-	0.07	0.29		
DHY-2 SSM	-	-	-	-	49.77	218.00	-	-	-	-	-	-	-	-	0.07	0.29		
TK-1	-	-	-	-	34.07	149.22	-	-	-	-	-	-	-	-	0.67	2.92	-	-
TK-2	-	-	-	-	34.07	149.22	-	-	-	-	-	-	-	-	0.67	2.92	-	-
TK-3	-	-	-	-	3.50	15.34	-	-	-	-	-	-	-	-	-	-	-	-
TK-4	-	-	-	-	3.50	15.34	-	-	-	-	-	-	-	-	-	-	-	-

Unit No.	NOx		CO		VOC		SO2		PM[1]		PM10		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
TK-5	-	-	-	-	3.50	15.34	-	-	-	-	-	-	-	-	-	-	-	-
TK-6	-	-	-	-	3.50	15.34	-	-	-	-	-	-	-	-	-	-	-	-
TK-TRI	-	-	-	-	0.22	0.97	-	-	-	-	-	-	-	-	-	-	-	-
LOADTRI	-	-	-	-	0.01	0.00	-	-	-	-	-	-	-	-	-	-	-	-
LOAD1	-	-	-	-	0.72	0.29	-	-	-	-	-	-	-	-	-	-	-	-
LOAD2	-	-	-	-	41.00	119.94	-	-	-	-	-	-	-	-	-	-	-	-
ROAD	-	-	-	-	-	-	-	-	1.35	5.20	0.34	1.33	0.03	0.13	-	-	-	-
AM-1	-	-	-	-	114.58	501.8	-	-	-	-	-	-	-	-	7,688.8	33,676.8	-	-
AM-2	-	-	-	-	114.6	501.8	-	-	-	-	-	-	-	-	7,688.8	33,676.8	-	-
Totals	42.36	185.54	124.68	546.09	492.94	2,096.55	0.36	1.58	6.94	29.68	5.93	25.81	5.62	24.61	15,379.62	67,362.74	-	-

[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		SO2		PM[1]		PM10		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
HOH-1	3.96	17.34	1.65	7.23	2.09	9.15	0.11	0.47	0.98	4.29	0.98	4.29	0.98	4.29	8.1E-04	0.004	-	-
HOH-2	3.96	17.34	1.65	7.23	2.09	9.15	0.11	0.47	0.98	4.29	0.98	4.29	0.98	4.29	8.1E-04	0.004	-	-
DHR-1	0.13	0.56	0.11	0.47	0.01	0.03	0.001	0.01	0.01	0.04	0.01	0.04	0.01	0.04	8.1E-06	3.6E-05	-	-
DHR-2	0.13	0.56	0.11	0.47	0.01	0.03	0.001	0.01	0.01	0.04	0.01	0.04	0.01	0.04	8.1E-06	3.6E-05	-	-
STABHR-1	0.55	2.42	0.57	2.48	0.10	0.42	0.015	0.06	0.13	0.59	0.13	0.59	0.13	0.59	1.1E-04	4.8E-04	-	-
CE-1	1.37	5.98	1.14	4.99	1.09	4.79	0.01	0.05	0.16	0.71	0.16	0.71	0.16	0.71	1.2E-04	5.3E-04	-	-
CE-2	1.37	5.98	1.14	4.99	1.09	4.79	0.01	0.05	0.16	0.71	0.16	0.71	0.16	0.71	1.2E-04	5.3E-04	-	-
CE-3	1.37	5.98	1.14	4.99	1.09	4.79	0.01	0.05	0.16	0.71	0.16	0.71	0.16	0.71	1.2E-04	5.3E-04	-	-
CE-4	1.37	5.98	1.14	4.99	1.09	4.79	0.01	0.05	0.16	0.71	0.16	0.71	0.16	0.71	1.2E-04	5.3E-04	-	-
CE-5	1.37	5.98	1.14	4.99	1.09	4.79	0.01	0.05	0.16	0.71	0.16	0.71	0.16	0.71	1.2E-04	5.3E-04	-	-
CE-6	1.37	5.98	1.14	4.99	1.09	4.79	0.01	0.05	0.16	0.71	0.16	0.71	0.16	0.71	1.2E-04	5.3E-04	-	-
CE-7	1.37	5.98	1.14	4.99	1.09	4.79	0.01	0.05	0.16	0.71	0.16	0.71	0.16	0.71	1.2E-04	5.3E-04	-	-
CE-8	1.52	6.66	0.76	3.33	0.96	4.23	0.01	0.03	0.11	0.49	0.11	0.49	0.11	0.49	8.3E-05	3.6E-04	-	-
CE-9	1.52	6.66	0.76	3.33	0.96	4.23	0.01	0.03	0.11	0.49	0.11	0.49	0.11	0.49	8.3E-05	3.6E-04	-	-
CE-10	1.52	6.66	0.76	3.33	0.96	4.23	0.01	0.03	0.11	0.49	0.11	0.49	0.11	0.49	8.3E-05	3.6E-04	-	-
CE-11	1.52	6.66	0.76	3.33	0.96	4.23	0.01	0.03	0.11	0.49	0.11	0.49	0.11	0.49	8.3E-05	3.6E-04	-	-
CE-12	1.52	6.66	0.76	3.33	0.96	4.23	0.01	0.03	0.11	0.49	0.11	0.49	0.11	0.49	8.3E-05	3.6E-04	-	-
TURB-1	2.97	13.03	3.51	15.39	1.74	7.63	0.002	0.01	0.34	1.49	0.34	1.49	0.34	1.49	-	-	-	-
TURB-2	2.97	13.03	3.51	15.39	1.74	7.63	0.002	0.01	0.34	1.49	0.34	1.49	0.34	1.49	-	-	-	-
TURB-3	2.97	13.03	3.51	15.39	1.74	7.63	0.002	0.01	0.34	1.49	0.34	1.49	0.34	1.49	-	-	-	-
TURB-4	2.97	13.03	3.51	15.39	1.74	7.63	0.002	0.01	0.34	1.49	0.34	1.49	0.34	1.49	-	-	-	-
TURB-5	2.97	13.03	3.51	15.39	1.74	7.63	0.002	0.01	0.34	1.49	0.34	1.49	0.34	1.49	-	-	-	-
TURB-6	Backup for TURB1-TURB5																	
FUG	-	-	-	-	14.50	63.49	-	-	-	-	-	-	-	-	0.61	2.68	-	-
AGFL-1	0.30	1.32	1.20	5.27	0.01	0.03	5.39	24.09	0.02	0.07	0.02	0.07	0.02	0.07	0.06	0.26	-	-
AGFL-1 SSM	See Table 2-F																	
FL-1	1.74	7.63	3.48	15.23	0.87	3.82	6.76	29.61	0.09	0.41	0.09	0.41	0.09	0.41	0.07	0.32	-	-
FL-1 SSM	See Table 2-F																	
DHY-1 SSM	See Table 2-F																	
DHY-2 SSM	See Table 2-F																	
TK-1	See Table 2-F																	
TK-2	See Table 2-F																	

Unit No.	NOx		CO		VOC		SO2		PM[1]		PM10		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
TK-3	See Table 2-F																	
TK-4	See Table 2-F																	
TK-5	See Table 2-F																	
TK-6	See Table 2-F																	
TK-TRI	-	-	-	-	0.22	0.97	-	-	-	-	-	-	-	-	2.3E-05	1.0E-04	-	-
LOADTRI	-	-	-	-	0.01	0.001	-	-	-	-	-	-	-	-	4.9E-05	9.4E-06	-	-
LOAD1	-	-	-	-	0.72	0.29	-	-	-	-	-	-	-	-	0.04	0.01	-	-
LOAD2	-	-	-	-	0.53	1.56	-	-	-	-	-	-	-	-	5.8E-10	1.7E-09	-	-
ROAD	-	-	-	-	-	-	-	-	1.351	5.203	0.34	1.33	0.03	0.13	-	-	-	-
SSMBD COMP	See Table 2-F																	
SSMBD DEHY	See Table 2-F																	
SSMBD Filters	See Table 2-F																	
SSMBD PIPE	See Table 2-F																	
Totals	42.81	187.51	38.11	166.90	42.34	181.78	12.51	55.29	6.98	29.86	5.97	25.99	5.66	24.79	0.78	3.28	-	-

[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

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**		SO2**		PM[2]		PM10		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
AGFL-1 SSM	100.73	7.13	401.16	28.38	9.03	0.64	3525.57	78.33	5.44	0.38	5.44	0.38	5.44	0.38	38.28	0.83	-	-
FL-1 SSM	93.73	6.89	187.13	13.76	173.52	12.99	1426.60	82.78	5.06	0.37	5.06	0.37	5.06	0.37	15.18	0.88	-	-
DHY-1 SSM	-	-	-	-	49.77	4.36	-	-	-	-	-	-	-	-	0.07	0.006	-	-
DHY-2 SSM	-	-	-	-	49.77	4.36	-	-	-	-	-	-	-	-	0.07	0.006	-	-
TK-1	-	-	-	-	0.68	2.98	-	-	-	-	-	-	-	-	0.01	0.058	-	-
TK-2	-	-	-	-	0.68	2.98	-	-	-	-	-	-	-	-	0.01	0.058	-	-
TK-3	-	-	-	-	0.07	0.31	-	-	-	-	-	-	-	-	2.7E-10	2.9E-10	-	-
TK-4	-	-	-	-	0.07	0.31	-	-	-	-	-	-	-	-	2.7E-10	2.9E-10	-	-
TK-5	-	-	-	-	0.07	0.31	-	-	-	-	-	-	-	-	2.7E-10	2.9E-10	-	-
TK-6	-	-	-	-	0.07	0.31	-	-	-	-	-	-	-	-	2.7E-10	2.9E-10	-	-
SSMBD COMP	-	-	-	-	232.07	11.60	-	-	-	-	-	-	-	-	0.002	7.7E-05	-	-
SSMBD DEHY	-	-	-	-	272.07	3.26	-	-	-	-	-	-	-	-	0.002	2.2E-05	-	-
SSMBD Filters	-	-	-	-	46.41	1.39	-	-	-	-	-	-	-	-	3.1E-04	9.2E-06	-	-
SSMBD PIPE	-	-	-	-	1,160.4	6.96	-	-	-	-	-	-	-	-	0.008	4.6E-05	-	-
Totals	100.73	14.02	401.16	42.14	1985.63	52.77	3525.57	161.10	5.44	0.76	5.44	0.76	5.44	0.76	38.45	1.84	-	-

[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).

** For SO2 and H2S, the facility-side maximum hourly emission rate occurs during AGFL SSM events. For VOC, that occurs during EC1/FL1/FL2 SSM

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																	

Table 2-H: Stack Exit Conditions (Titan Treater Plant #2)

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)			
HOH-1	HOH-1	V	No	90	1000	1047.11	-	-	63.47	4.58
HOH-2	HOH-2	V	No	90	1000	1047.11	-	-	63.47	4.58
DHR-1	DHR-1	V	No	19	400	6.17	-	-	6.49	1.10
DHR-2	DHR-2	V	No	19	400	6.17	-	-	6.49	1.10
STABHR-1	STABHR-1	V	No	21	400	84.09	-	-	26.77	2.00
CE-1	CE-1	V	No	25	775	215.02	-	-	68.44	2.00
CE-2	CE-2	V	No	25	775	215.02	-	-	68.44	2.00
CE-3	CE-3	V	No	25	775	215.02	-	-	68.44	2.00
CE-4	CE-4	V	No	25	775	215.02	-	-	68.44	2.00
CE-5	CE-5	V	No	25	775	215.02	-	-	68.44	2.00
CE-6	CE-6	V	No	25	775	215.02	-	-	68.44	2.00
CE-7	CE-7	V	No	25	775	215.02	-	-	68.44	2.00
CE-8	CE-8	V	No	25	813	132.55	-	-	95.41	1.33
CE-9	CE-9	V	No	25	813	132.55	-	-	95.41	1.33
CE-10	CE-10	V	No	25	813	132.55	-	-	95.41	1.33
CE-11	CE-11	V	No	25	813	132.55	-	-	95.41	1.33
CE-12	CE-12	V	No	25	813	132.55	-	-	95.41	1.33
TURB-1	TURB-1	V	No	20	1000	695.53	-	-	98.40	3.00
TURB-2	TURB-2	V	No	20	1000	695.53	-	-	98.40	3.00
TURB-3	TURB-3	V	No	20	1000	695.53	-	-	98.40	3.00
TURB-4	TURB-4	V	No	20	1000	695.53	-	-	98.40	3.00
TURB-5	TURB-5	V	No	20	1000	695.53	-	-	98.40	3.00
TURB-6	TURB-6	V	No	20	1000	695.53	-	-	98.40	3.00
AGFL-1	AGFL-1	V	No	150	1,832	191.89	-	-	65.60	2.00
FL-1	FL-1	V	No	150	1,832	117.22	-	-	65.60	2.00

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		Formaldehyde ☑ HAP or TAP		Methanol ☑ HAP or TAP		n-Hexane ☑ HAP or TAP		Toluene ☑ HAP or TAP		Provide Pollutant Name Here HAP or TAP		Provide Pollutant Name Here 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
HOH-1	HOH-1	0.29	1.28	-	-	-	0.00	0.012	0.05	-	-	0.28	1.22	-	0.00				
HOH-2	HOH-2	0.29	1.28	-	-	-	0.00	0.012	0.05	-	-	0.28	1.22	-	0.00				
DHR-1	DHR-1	0.00	0.01	-	-	-	-	-	-	-	-	0.00	0.01	-	-				
DHR-2	DHR-2	0.00	0.01	-	-	-	-	-	-	-	-	0.00	0.01	-	-				
STABHR-1	STABHR-1	0.04	0.17	-	-	-	-	0.002	0.01	-	-	0.04	0.17	-	-				
CE-1	CE-1	0.28	1.23	0.03	0.13	0.01	0.03	0.137	0.60	0.04	0.18	0.02	0.08	0.01	0.03				
CE-2	CE-2	0.28	1.23	0.03	0.13	0.01	0.03	0.137	0.60	0.04	0.18	0.02	0.08	0.01	0.03				
CE-3	CE-3	0.28	1.23	0.03	0.13	0.01	0.03	0.137	0.60	0.04	0.18	0.02	0.08	0.01	0.03				
CE-4	CE-4	0.28	1.23	0.03	0.13	0.01	0.03	0.137	0.60	0.04	0.18	0.02	0.08	0.01	0.03				
CE-5	CE-5	0.28	1.23	0.03	0.13	0.01	0.03	0.137	0.60	0.04	0.18	0.02	0.08	0.01	0.03				
CE-6	CE-6	0.28	1.23	0.03	0.13	0.01	0.03	0.137	0.60	0.04	0.18	0.02	0.08	0.01	0.03				
CE-7	CE-7	0.28	1.23	0.03	0.13	0.01	0.03	0.137	0.60	0.04	0.18	0.02	0.08	0.01	0.03				
CE-8	CE-8	0.24	1.06	0.01	0.06	0.00	0.01	0.183	0.80	0.02	0.07	0.01	0.03	0.00	0.01				
CE-9	CE-9	0.24	1.06	0.01	0.06	0.00	0.01	0.183	0.80	0.02	0.07	0.01	0.03	0.00	0.01				
CE-10	CE-10	0.24	1.06	0.01	0.06	0.00	0.01	0.183	0.80	0.02	0.07	0.01	0.03	0.00	0.01				
CE-11	CE-11	0.24	1.06	0.01	0.06	0.00	0.01	0.183	0.80	0.02	0.07	0.01	0.03	0.00	0.01				
CE-12	CE-12	0.24	1.06	0.01	0.06	0.00	0.01	0.183	0.80	0.02	0.07	0.01	0.03	0.00	0.01				
TURB-1	TURB-1	0.05	0.23	0.00	0.01	-	0.00	0.038	0.17	-	-	-	-	0.01	0.03				
TURB-2	TURB-2	0.05	0.23	0.00	0.01	-	0.00	0.038	0.17	-	-	-	-	0.01	0.03				
TURB-3	TURB-3	0.05	0.23	0.00	0.01	-	0.00	0.038	0.17	-	-	-	-	0.01	0.03				
TURB-4	TURB-4	0.05	0.23	0.00	0.01	-	0.00	0.038	0.17	-	-	-	-	0.01	0.03				
TURB-5	TURB-5	0.05	0.23	0.00	0.01	-	0.00	0.038	0.17	-	-	-	-	0.01	0.03				
TURB-6	TURB-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
FUG	FUG	0.94	4.10	-	-	0.26	1.16	-	-	-	-	0.52	2.29	0.12	0.51				
AGFL-1	AGFL-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
AGFL-1 SSM	AGFL-1 SSM	0.05	0.00	-	-	0.05	0.00	-	-	-	-	-	-	0.00	-				

Stack No.	Unit No.(s)	Total HAPs		Acetaldehyde ☑ HAP or TAP		Benzene ☑ HAP or TAP		Formaldehyde ☑ HAP or TAP		Methanol ☑ HAP or TAP		n-Hexane ☑ HAP or TAP		Toluene ☑ HAP or TAP		Provide Pollutant Name Here HAP or TAP		Provide Pollutant Name Here 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
FL-1	FL-1	0.04	0.04	-	-	0.01	0.01	-	-	-	-	0.02	0.02	0.01	0.01				
FL-1 SSM	FL-1 SSM	8.42	0.45	-	-	2.40	0.13	-	-	-	-	3.39	0.18	1.90	0.10				
DHY-1 SSM	DHY-1 SSM	7.45	0.65	-	-	5.94	0.52	-	-	-	-	0.38	0.03	1.04	0.09				
DHY-2 SSM	DHY-2 SSM	7.45	0.65	-	-	5.94	0.52	-	-	-	-	0.38	0.03	1.04	0.09				
TK-1	TK-1	0.03	0.14	-	-	0.01	0.04	-	-	-	-	0.02	0.08	0.00	0.02				
TK-2	TK-2	0.03	0.14	-	-	0.01	0.04	-	-	-	-	0.02	0.08	0.00	0.02				
TK-3	TK-3	0.01	0.02	-	-	0.00	0.01	-	-	-	-	0.00	0.02	-	0.00				
TK-4	TK-4	0.01	0.02	-	-	0.00	0.01	-	-	-	-	0.00	0.02	-	0.00				
TK-5	TK-5	0.01	0.02	-	-	0.00	0.01	-	-	-	-	0.00	0.02	-	0.00				
TK-6	TK-6	0.01	0.02	-	-	0.00	0.01	-	-	-	-	0.00	0.02	-	0.00				
TK-TRI	TK-TRI	0.00	0.01	-	-	-	-	-	-	-	-	-	-	-	-				
LOADTRI	LOADTRI	0.01	0.00	-	-	-	-	-	-	-	-	-	-	-	-				
LOAD1	LOAD1	0.16	0.06	-	-	0.04	0.02	-	-	-	-	0.09	0.04	0.02	0.01				
LOAD2	LOAD2	0.05	0.14	-	-	0.02	0.05	-	-	-	-	0.03	0.08	0.00	0.01				
ROAD	ROAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
SSMBD COMP	SSMBD COMP	0.57	0.03	-	-	0.23	0.01	-	-	-	-	0.31	0.02	0.03	0.00				
SSMBD DEHY	SSMBD DEHY	0.70	0.01	-	-	0.30	0.00	-	-	-	-	0.37	0.00	0.03	-				
SSMBD Filters	SSMBD Filters	0.11	0.00	-	-	0.05	0.00	-	-	-	-	0.06	0.00	0.01	-				
SSMBD PIPE	SSMBD PIPE	2.86	0.02	-	-	1.15	0.01	-	-	-	-	1.57	0.01	0.13	-				
Totals:		32.95	24.35	0.28	1.24	16.49	2.84	2.09	9.14	0.37	1.61	7.94	6.27	4.44	1.28				

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 (Btu/scf)	Hourly Usage (scf)	Annual Usage (MMscf)	% Sulfur	% Ash
HOH-1	Natural Gas	Purchased	1,220	90,168	789.9	0.00	0
HOH-2	Natural Gas	Purchased	1220	90,168	789.9	0.00	0
DHR-1	Natural Gas	Purchased	1,220	902	7.9	0.00	0
DHR-2	Natural Gas	Purchased	1220	902	7.9	0.00	0
STABHR-1	Natural Gas	Purchased	1,220	12,296	107.7	0.00	0
CE-1	Natural Gas	Purchased	1,220	13,359	117.0	0.00	0
CE-2	Natural Gas	Purchased	1,220	13,359	117.0	0.00	0
CE-3	Natural Gas	Purchased	1,220	13,359	117.0	0.00	0
CE-4	Natural Gas	Purchased	1,220	13,359	117.0	0.00	0
CE-5	Natural Gas	Purchased	1,220	13,359	117.0	0.00	0
CE-6	Natural Gas	Purchased	1,220	13,359	117.0	0.00	0
CE-7	Natural Gas	Purchased	1,220	13,359	117.0	0.00	0
CE-8	Natural Gas	Purchased	1,220	9,255	81.1	0.00	0
CE-9	Natural Gas	Purchased	1,220	9,255	81.1	0.00	0
CE-10	Natural Gas	Purchased	1,220	9,255	81.1	0.00	0
CE-11	Natural Gas	Purchased	1,220	9,255	81.1	0.00	0
CE-12	Natural Gas	Purchased	1,220	9,255	81.1	0.00	0
TURB-1	Natural Gas	Purchased	1,220	44,322	388.3	0.00	0
TURB-2	Natural Gas	Purchased	1,220	44,322	388.3	0.00	0

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 (Btu/scf)	Hourly Usage (scf)	Annual Usage (MMscf)	% Sulfur	% Ash
TURB-3	Natural Gas	Purchased	1,220	44,322	388.3	0.00	0
TURB-4	Natural Gas	Purchased	1,220	44,322	388.3	0.00	0
TURB-5	Natural Gas	Purchased	1,220	44,322	388.3	0.00	0
TURB-6	Natural Gas	Purchased	1,220	44,322	388.3	0.00	0
AGFL-1	Natural Gas	Purchased	1,271	1,700	14.9	0.00	0
FL-1	Natural Gas	Purchased	1,271	7,400	64.8	0.00	0

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)
TK-1	40400311	Slop Water	99.5% Water/0.5% Oil	3.49	55.04	65.41	11.75	72.45	13.26
TK-2	40400311	Slop Water	99.5% Water/0.5% Oil	3.49	55.04	65.41	11.75	72.45	13.26
TK-3	40400311	Condensate	Condensate	5.69	75.63	65.36	4.31	72.45	5.03
TK-4	40400311	Condensate	Condensate	5.69	75.63	65.36	4.31	72.45	5.03
TK-5	40400311	Condensate	Condensate	5.69	75.63	65.36	4.31	72.45	5.03
TK-6	40400311	Condensate	Condensate	5.69	75.63	65.36	4.31	72.45	5.03
TK-TRI	40400311	Spent Triazine	96% Water/ 3.8% Triazine/ 0.2% Oil	8.46	24.19	67.67	12.42	76.27	13.26

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			
TK-1	TBD	Slop Water	FR	N/A	400 bbl	64	3.66	6.10	OT (Tan)	OT (Tan)	Good	3,483,377	242.17
TK-2	TBD	Slop Water	FR	N/A	400 bbl	64	3.66	6.10	OT (Tan)	OT (Tan)	Good	3,483,377	242.17
TK-3	TBD	Condensate	FR	N/A	1000 bbl	119	4.72	9.14	OT (Tan)	OT (Tan)	Good	15,730,929	428.60
TK-4	TBD	Condensate	FR	N/A	1000 bbl	119	4.72	9.14	OT (Tan)	OT (Tan)	Good	15,730,929	428.60
TK-5	TBD	Condensate	FR	N/A	1000 bbl	119	4.72	9.14	OT (Tan)	OT (Tan)	Good	15,730,929	428.60
TK-6	TBD	Condensate	FR	N/A	1000 bbl	119	4.72	9.14	OT (Tan)	OT (Tan)	Good	15,730,929	428.60
TK-TRI	TBD	Spent Triazine	FR	N/A	400 bbl	64	3.66	6.10	OT (Tan)	OT (Tan)	Good	1,532,999	106.58

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 (MMscfd)**	**Description**	**Chemical Composition**	**Phase**	**Quantity (MMscfd)**
Natural Gas	Natural Gas	Gas	220.0	Natural Gas	Natural Gas	Gas	183.33

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**									
HOH-1	**mass GHG**	66.10	-	0.00										66.1	
	CO_2e	66.10	-	0.03											66.1
HOH-2	**mass GHG**	66.10	-	0.00										66.1	
	CO_2e	66.10	-	0.03											66.1
DHR-1	**mass GHG**	0.66	-	-										0.7	
	CO_2e	0.66	-	-											0.7
DHR-2	**mass GHG**	0.66	-	-										0.7	
	CO_2e	0.66	-	-											0.7
STABHR-1	**mass GHG**	9.01	-	-										9.0	
	CO_2e	9.01	-	0.00											9.0
CE-1	**mass GHG**	8015.98	-	0.16										8016.1	
	CO_2e	8015.98	-	3.93											8019.9
CE-2	**mass GHG**	8015.98	-	0.16										8016.1	
	CO_2e	8015.98	-	3.93											8019.9
CE-3	**mass GHG**	8015.98	-	0.16										8016.1	
	CO_2e	8015.98	-	3.93											8019.9
CE-4	**mass GHG**	8015.98	-	0.16										8016.1	
	CO_2e	8015.98	-	3.93											8019.9
CE-5	**mass GHG**	8015.98	-	0.16										8016.1	
	CO_2e	8015.98	-	3.93											8019.9
CE-6	**mass GHG**	8015.98	-	0.16										8016.1	
	CO_2e	8015.98	-	3.93											8019.9
CE-7	**mass GHG**	8015.98	-	0.16										8016.1	
	CO_2e	8015.98	-	3.93											8019.9
CE-8	**mass GHG**	6076.51	-	0.00										6076.5	
	CO_2e	6076.51	-	0.12											6076.6
CE-9	**mass GHG**	6076.51	-	0.00										6076.5	
	CO_2e	6076.51	-	0.12											6076.6
CE-10	**mass GHG**	6076.51	-	0.00										6076.5	
	CO_2e	6076.51	-	0.12											6076.6
CE-11	**mass GHG**	6076.51	-	0.00										6076.5	
	CO_2e	6076.51	-	0.12											6076.6
CE-12	**mass GHG**	6076.51	-	0.00										6076.5	
	CO_2e	6076.51	-	0.12											6076.6
TURB-1	**mass GHG**	27708.32	0.05	0.52										27708.9	
	CO_2e	27708.32	15.56	13.06											27736.9
TURB-2	**mass GHG**	27708.32	0.05	0.52										27708.9	
	CO_2e	27708.32	15.56	13.06											27736.9

		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**									
TURB-3	**mass GHG**	27708.32	0.05	0.52										27708.9	
	CO_2e	27708.32	15.56	13.06											27736.9
TURB-4	**mass GHG**	27708.32	0.05	0.52										27708.9	
	CO_2e	27708.32	15.56	13.06											27736.9
TURB-5	**mass GHG**	27708.32	0.05	0.52										27708.9	
	CO_2e	27708.32	15.56	13.06											27736.9
TURB-6	**mass GHG**	-	-	-										-	
	CO_2e	-	-	-											-
FUG	**mass GHG**	15.53	-	37.88										53.4	
	CO_2e	15.53	-	947.06											962.6
AGFL-1	**mass GHG**	939.32	-	1.71										941.0	
	CO_2e	939.32	-	42.85											982.2
AGFL-1 SSM	**mass GHG**	4989.35	-	32.72										5022.1	
	CO_2e	4989.35	0.00	817.90											5807.3
FL-1	**mass GHG**	5240.11	-	15.68										5255.8	
	CO_2e	5240.11	0.00	391.91											5632.0
FL-1 SSM	**mass GHG**	5237.39	-	15.23										5252.6	
	CO_2e	5237.39	0.00	380.77											5618.2
DHY-1 SSM	**mass GHG**	0.04	-	17.60										17.6	
	CO_2e	0.04	-	439.91											439.9
DHY-2 SSM	**mass GHG**	0.04	-	17.60										17.6	
	CO_2e	0.04	-	439.91											439.9
TK-1	**mass GHG**	3.14	-	0.01										3.1	
	CO_2e	3.14	-	0.23											3.4
TK-2	**mass GHG**	3.14	-	0.01										3.1	
	CO_2e	3.14	-	0.23											3.4
TK-3	**mass GHG**	-	-	-										-	
	CO_2e	-	-	-											-
TK-4	**mass GHG**	-	-	-										-	
	CO_2e	-	-	-											-
TK-5	**mass GHG**	-	-	-										-	
	CO_2e	-	-	-											-
TK-6	**mass GHG**	-	-	-										-	
	CO_2e	-	-	-											-
TK-TRI	**mass GHG**	10.48	-	7.13										17.6	
	CO_2e	10.48	-	178.29											188.8
LOADTRI	**mass GHG**	0.26	-	-										0.3	
	CO_2e	0.26	-	-											0.3
LOAD1	**mass GHG**	-	-	-										-	
	CO_2e	-	-	-											-
LOAD2	**mass GHG**	-	-	-										-	
	CO_2e	-	-	-											-
ROAD	**mass GHG**	-	-	-										-	
	CO_2e	-	-	-											-

		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**									
SSMBD	**mass GHG**	-	-	22.67										22.7	
COMP	**CO_2e**	-	-	566.72											566.7
SSMBD	**mass GHG**	-	-	6.37										6.4	
DEHY	**CO_2e**	-	-	159.26											159.3
SSMBD	**mass GHG**	-	-	2.72										2.7	
Filters	**CO_2e**	-	-	68.01											68.0
SSMBD	**mass GHG**	-	-	13.60										13.6	
PIPE	**CO_2e**	-	-	340.03											340.0
Total	**mass GHG**	241617.37	0.26	194.66										241812.3	
	CO_2e	241617.37	77.82	4866.58											246561.8

[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.

In accordance with 20.2.72.200.A(1) NMAC, Northwind Midstream Partners, LLC (Northwind) is submitting this application for a new gas treating facility located in Lea County, NM. The Titan Treater Plant #2 will have 220 MMscfd of treating capacity. The facility receives sour natural gas from field production 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.

With this application Northwind is proposing to add the following equipment:

- Seven (7) Caterpillar G3606 compressor engines rated at 2065 horsepower (hp) – (CE-1 to CE-7)
- Five (5) Caterpillar G3516 compressor engines rated at 1380 horsepower (hp) – (CE-8 to CE-12)
- Six (6) Solar T60 Turbines rated at 6,370 horsepower for power generation (TURB-1 to TURB-6),
- Two (2) triethylene glycol dehydrators (DHY-1, DHY-2) and associated glycol regenerator heaters (DHR-1, DHR-2),
- One (1) acid gas flare (AGFL-1),
- One (1) process flare (FL-1),
- Slop water loading (LOAD-1),
- Condensate loading (LOAD-2) during pipeline shutdowns, with emissions routed to redundant VRUs,
- Two (2) slop water storage tanks (TK-1, TK-2) with emissions routed to redundant VRUs,
- Four (4) condensate storage tanks (TK-3 to TK-6) with emissions routed to redundant VRUs,
- One (1) Spent Triazine storage tank (TK-TRI),
- Five (5) electric-drive acid gas compressors (AGI-COMP1 to AGI-COMP5),
- Haul roads (ROAD),
- One (1) stabilizer heater (STABHR-1),
- Two (2) hot oil heaters (HOH-1, HOH-2) and,
- Three (3) electric-drive stabilizer overhead compressors (SOH-COMP1 to SOH-COMP3).

Startup, Shutdown, and Maintenance (SSM) Emissions

SSM emissions are a result of equipment blowdowns for maintenance as well as equipment downtime. Some sweet gas SSM is vented and some is flared, while all sour gas SSM is routed to a control device. Each SSM stream is discussed in more detail below.

Sweet Gas Blowdowns – Sweet gas is blown down to the atmosphere from compressors (SSM-BD COMP), dehydrator contactors (SSM-DEHY), coalescer filters (SSM-BD FILTER), and miscellaneous piping (SSM-BD PIPE). Worst case volumes were calculated and/or estimated. Emissions were estimated based on the number of blowdowns expected during the year. Stream compositions were obtained from Promax.

Acid Gas Blowdowns – During SSM events, acid gas is routed to the flare (AGFL-1). AGI compressors are blown down during maintenance activities. Compressor volumes were calculated, with up to three potentially blown down at the same time. Equipment used in the sweetening process may also be blown down to the flare, both individually and together. Various equipment volumes were calculated and included to estimate the hourly flow rate. Stream compositions were obtained from Promax.

Inlet Gas Blowdowns – During SSM events, inlet gas would be routed to the plant flare (FL-1). The volume of the inlet slug catcher was used to estimate maximum hourly emissions. For annual rates, the volumes of each piece of equipment and the estimated number of events were used. Stream compositions were obtained from Promax.

VRU Downtime – During VRU downtime, tank vapor and dehydrator still vent vapor are routed to atmosphere. This is assumed to occur up to 175 hours per year.

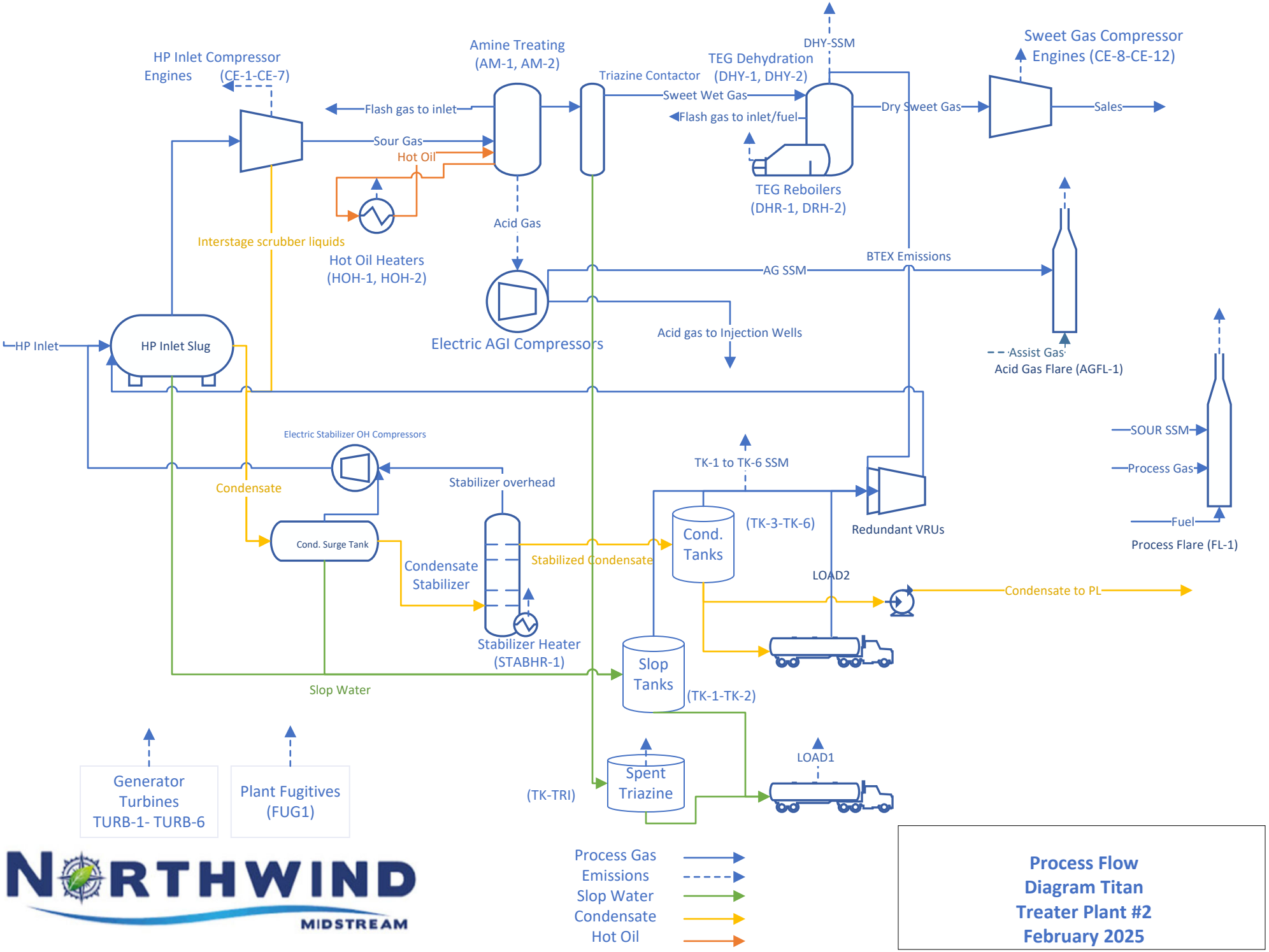
SSM events at AGFL-1 SSM will not occur at the same time as FL-1SSM.

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.


HP Inlet Compressor Engines (CE-1-CE-7)
Amine Treating (AM-1, AM-2)
Triazine Contactor
TEG Dehydration (DHY-1, DHY-2)
DHY-SSM
Sweet Gas Compressor Engines (CE-8-CE-12)
Flash gas to inlet
Sour Gas
Hot Oil
Sweet Wet Gas
Flash gas to inlet/fuel
Dry Sweet Gas
Sales
TEG Reboilers (DHR-1, DRH-2)
Interstage scrubber liquids
Hot Oil Heaters (HOH-1, HOH-2)
Acid Gas
BTEX Emissions
AG SSM
HP Inlet
HP Inlet Slug
Electric AGI Compressors
Acid gas to Injection Wells
Assist Gas
Acid Gas Flare (AGFL-1)
Electric Stabilizer OH Compressors
Condensate
Stabilizer overhead
TK-1 to TK-6 SSM
SOUR SSM
Process Gas
Fuel
Process Flare (FL-1)
Cond. Surge Tank
Condensate Stabilizer
Stabilized Condensate
Cond. Tanks
(TK-3-TK-6)
Redundant VRUs
LOAD2
Condensate to PL
Stabilizer Heater (STABHR-1)
Slop Water
Slop Tanks
(TK-1-TK-2)
Spent Triazine
(TK-TRI)
LOAD1
Generator Turbines TURB-1- TURB-6
Plant Fugitives (FUG1)
Process Gas
Emissions
Slop Water
Condensate
Hot Oil
NORTHWIND MIDSTREAM
Process Flow Diagram Titan Treater Plant #2 February 2025

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 is attached on the following page.

PLANT NORTH

E. 2+00'-0" E. 3+00'-0" E. 4+00'-0" E. 5+00'-0" E. 6+00'-0" E. 7+00'-0" E. 8+00'-0" E. 9+00'-0" E. 10+00'-0" E. 11+00'-0" E. 12+00'-0" E. 13+00'-0" E. 14+00'-0" E. 15+00'-0" E. 16+00'-0" E. 17+00'-0" E. 18+00'-0" E. 19+00'-0" E. 20+00'-0"

N. 30+00'-0"
N. 29+00'-0"
N. 28+00'-0"
N. 27+00'-0"
N. 26+00'-0"
N. 25+00'-0"
N. 24+00'-0"
N. 23+00'-0"
N. 22+00'-0"
N. 21+00'-0"
N. 20+00'-0"
N. 19+00'-0"

TRUCK TURNAROUND
PLANT ROAD
TRUCK LOADING/UNLOADING
SK-24000
10' WIDE SLEEPERS
TK-47700
TK-47710
C-47900
C-47925
SK 10
TK-47XXX
TK-47025
TK-47590
P-47050/47055
TK-47750
SK 11
V-47825
P-47835
TK-47600
TK-47610
TK-47620
TK-47630
P-47660/47670
H-49250
SK-47770
SK-47795
TK-47790
TK-47780
P-47785
V-47800
P-47810
15' WIDE PIPERACK
SKP-44000
C-42500
AC-42500
C-42525
AC-42525
C-42550
AC-42550
S-49410
SK 3
SK 2
AC-42375
T-42300
V-42150
SK 4
V-47175
FL-48200
P-48250
BMS
PLANT ROAD
PLANT ROAD
V-41001
E-41005
GENERATORS
TO PIPELINE
F-45050
S-49400
20' WIDE PIPERACK
S-44800
P-45200
P-45250
V-45050
P-45050
P-45075
T-43600
V-43700
AC-43675
SK 8
V-43400
P-43300
P-43325
P-43350
SK 6
SK 7
CONT.
F-43550
AC-43500
V-47150
H-49200
V-44175
AC-43200
V-43250
F-44100
F-46200
T-44125/E-44150
CP-47175
V-41200
F-43100
T-43150
TK-47850
P-47860
TK-47875
P-47885
C-46175
AC-46175
C-46150
AC-46150
C-46100
AC-46100
V-47100
V-47200/47225
C-41200
AC-41200
C-41175
AC-41175
C-41150
AC-41150
C-41100
AC-41100
C-45175
AC-45175
C-45150
AC-45150
C-45100
AC-45100
XISTING SCM OIL PIPELINE
PLANT ROAD
SK 1
COND. SDV
V-41000
10' WIDE PIPERACK
P-48050/48055
V-48025
6' WIDE PIPERACK
FL-42000
INLET SDV
R300'
PDC BLDG.

* – ALL SKID, EQUIPMENT SIZING AND LOCATIONS ARE PRELIMINARY

NOTES

1. THE EASTSIDE FENCE LINE EXTENDS TO APPROXIMATELY E. 30+00'-0".

NOTICE

REVISIONS

REV.	DESCRIPTION	DRWN	CHKD	APPRV	DATE
B	ISSUED FOR PERMIT	RNB	HVP	MK	02/26/25
A	REVISED AS PER NWM COMMENTS	RNB	HVP	MK	02/18/25
I	ISSUED FOR INFORMATION	WBC	BC	XXX	11/4/24

PROJECT INFO.

DRAWN BY	WBC
DATE	11/3/24
JOB NO.	24250
AFE/P.O. NO.	
CLIENT FILE NO.	
SCALE	1"=80'

azota GAS PROCESSING, LTD.

TITLE
PLOT PLAN
TITAN TREATING PLANT 2
NORTHWIND MIDSTREAM

DWG. NO. 24250-03-00-002

REV. B

Drawing name: P:\02_From WHCK\02_Outputs\03_Output\Plot Plan\24250-03-00-001-002_Rev B.dwg Plotted on: Feb 26, 2025 - 6:22pm

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.

Calculations are provided with detailed notes explaining the methodology.

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)

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
Emissions Summary

EPN	Units	VOC	NOx	CO	PM10	PM2.5	SO2	H2S	Methane	CO2	N2O	Acetaldehyde	Benzene	Formaldehyde	Methanol	n-Hexane	Toluene	Total HAP
HOH-1	tpy	9.15	17.34	7.23	4.29	4.29	0.47	0.004	0.001	66.10	-	-	0.001	0.05	-	1.22	0.002	1.28
HOH-2	tpy	9.15	17.34	7.23	4.29	4.29	0.47	0.004	0.001	66.10	-	-	0.001	0.05	-	1.22	0.002	1.28
DHR-1	tpy	0.03	0.56	0.47	0.04	0.04	0.006	3.55E-05	-	0.66	-	-	-	-	-	0.01	-	0.01
DHR-2	tpy	0.03	0.56	0.47	0.04	0.04	0.006	3.55E-05	-	0.66	-	-	-	-	-	0.01	-	0.01
STABHR-1	tpy	0.42	2.42	2.48	0.59	0.59	0.06	4.84E-04	-	9.01	-	-	-	0.007	-	0.17	-	0.17
CE-1	tpy	4.79	5.98	4.99	0.71	0.71	0.05	5.26E-04	0.16	8015.98	-	0.13	0.03	0.60	0.18	0.08	0.03	1.23
CE-2	tpy	4.79	5.98	4.99	0.71	0.71	0.05	5.26E-04	0.16	8015.98	-	0.13	0.03	0.60	0.18	0.08	0.03	1.23
CE-3	tpy	4.79	5.98	4.99	0.71	0.71	0.05	5.26E-04	0.16	8015.98	-	0.13	0.03	0.60	0.18	0.08	0.03	1.23
CE-4	tpy	4.79	5.98	4.99	0.71	0.71	0.05	5.26E-04	0.16	8015.98	-	0.13	0.03	0.60	0.18	0.08	0.03	1.23
CE-5	tpy	4.79	5.98	4.99	0.71	0.71	0.05	5.26E-04	0.16	8015.98	-	0.13	0.03	0.60	0.18	0.08	0.03	1.23
CE-6	tpy	4.79	5.98	4.99	0.71	0.71	0.05	5.26E-04	0.16	8015.98	-	0.13	0.03	0.60	0.18	0.08	0.03	1.23
CE-7	tpy	4.79	5.98	4.99	0.71	0.71	0.05	5.26E-04	0.16	8015.98	-	0.13	0.03	0.60	0.18	0.08	0.03	1.23
CE-8	tpy	4.23	6.66	3.33	0.49	0.49	0.03	3.65E-04	0.005	6076.51	-	0.06	0.01	0.80	0.07	0.03	0.01	1.06
CE-9	tpy	4.23	6.66	3.33	0.49	0.49	0.03	3.65E-04	0.005	6076.51	-	0.06	0.01	0.80	0.07	0.03	0.01	1.06
CE-10	tpy	4.23	6.66	3.33	0.49	0.49	0.03	3.65E-04	0.005	6076.51	-	0.06	0.01	0.80	0.07	0.03	0.01	1.06
CE-11	tpy	4.23	6.66	3.33	0.49	0.49	0.03	3.65E-04	0.005	6076.51	-	0.06	0.01	0.80	0.07	0.03	0.01	1.06
CE-12	tpy	4.23	6.66	3.33	0.49	0.49	0.03	3.65E-04	0.005	6076.51	-	0.06	0.01	0.80	0.07	0.03	0.01	1.06
TURB-1	tpy	7.63	13.03	15.39	1.49	1.49	0.01	-	0.52	27708.32	0.05	0.009	0.003	0.17	-	-	0.03	0.23
TURB-2	tpy	7.63	13.03	15.39	1.49	1.49	0.01	-	0.52	27708.32	0.05	0.009	0.003	0.17	-	-	0.03	0.23
TURB-3	tpy	7.63	13.03	15.39	1.49	1.49	0.01	-	0.52	27708.32	0.05	0.009	0.003	0.17	-	-	0.03	0.23
TURB-4	tpy	7.63	13.03	15.39	1.49	1.49	0.01	-	0.52	27708.32	0.05	0.009	0.003	0.17	-	-	0.03	0.23
TURB-5	tpy	7.63	13.03	15.39	1.49	1.49	0.01	-	0.52	27708.32	0.05	0.009	0.003	0.17	-	-	0.03	0.23
TURB-6	tpy	Backup for TURB 1 - TURB-5																
FUG	tpy	63.49	-	-	-	-	-	2.68	37.88	15.53	-	-	1.16	-	-	2.29	0.51	4.10
AGFL-1	tpy	0.03	1.32	5.27	0.07	0.07	24.09	0.26	1.71	939.32	-	-	-	-	-	-	-	-
AGFL-1 SSM	tpy	0.64	7.13	28.38	0.38	0.38	78.33	0.83	32.72	4989.35	-	-	0.001	-	-	-	-	0.001
FL-1	tpy	3.82	7.63	15.23	0.41	0.41	29.61	0.32	15.68	5240.11	-	-	0.01	-	-	0.02	0.009	0.04
FL-1 SSM	tpy	12.99	6.89	13.76	0.37	0.37	82.78	0.88	15.23	5237.39	-	-	0.13	-	-	0.18	0.10	0.45
DHY-1 SSM	tpy	4.36	--	--	--	--	--	0.07	17.60	0.04	-	-	0.52	-	-	0.03	0.09	0.65
DHY-2 SSM	tpy	4.36	--	--	--	--	--	0.006	17.60	0.04	-	-	0.52	-	-	0.03	0.09	0.65
TK-1	tpy	2.98	-	-	-	-	-	0.06	0.009	3.14	-	-	0.04	-	-	0.08	0.02	0.14
TK-2	tpy	2.98	-	-	-	-	-	0.06	0.009	3.14	-	-	0.04	-	-	0.08	0.02	0.14
TK-3	tpy	0.31	-	-	-	-	-	2.90E-10	1.59E-15	-	-	-	0.007	-	-	0.02	0.002	0.02
TK-4	tpy	0.31	-	-	-	-	-	2.90E-10	1.59E-15	-	-	-	0.007	-	-	0.02	0.002	0.02
TK-5	tpy	0.31	-	-	-	-	-	2.90E-10	1.59E-15	-	-	-	0.007	-	-	0.02	0.002	0.02
TK-6	tpy	0.31	-	-	-	-	-	2.90E-10	1.59E-15	-	-	-	0.007	-	-	0.02	0.002	0.02
TK-TRI	tpy	0.97	-	-	-	-	-	1.02E-04	7.13	10.48	-	-	-	-	-	-	-	0.01
LOADTRI	tpy	0.001	-	-	-	-	-	9.35E-06	-	0.26	-	-	-	-	-	-	-	0.001
LOAD1	tpy	0.29	-	-	-	-	-	0.01	-	-	-	-	0.02	-	-	0.04	0.008	0.06
LOAD2	tpy	1.56	-	-	-	-	-	1.68E-09	-	-	-	-	0.05	-	-	0.08	0.01	0.14
ROAD	tpy	-	-	-	1.33	0.13	-	-	-	-	-	-	-	-	-	-	-	-
SSMBD COMP	tpy	11.60	-	-	-	-	-	7.69E-05	22.67	-	-	-	0.01	-	-	0.02	0.001	0.03
SSMBD DEHY	tpy	3.26	-	-	-	-	-	2.19E-05	6.37	-	-	-	0.004	-	-	0.004	-	0.008
SSMBD Filters	tpy	1.39	-	-	-	-	-	9.22E-06	2.72	-	-	-	0.001	-	-	0.002	-	0.003
SSMBD PIPE	tpy	6.96	-	-	-	-	-	4.61E-05	13.60	-	-	-	0.007	-	-	0.009	-	0.02
Total	**tpy**	**234.54**	**201.52**	**209.04**	**26.74**	**25.55**	**216.39**	**5.18**	**194.66**	**241,617.37**	**0.26**	**1.24**	**2.84**	**9.14**	**1.61**	**6.27**	**1.28**	**24.35**
Total minus Fugitives	**tpy**	**171.05**	**201.52**	**209.04**	**26.74**	**25.55**	**216.39**	**2.50**	**156.78**	**241,601.84**	**0.26**	**1.24**	**1.69**	**9.14**	**1.61**	**3.98**	**0.78**	**20.25**
EPN	**Units**	**VOC**	**NOx**	**CO**	**PM10**	**PM2.5**	**SO2**	**H2S**	**Methane**	**CO2**	**N2O**	**Acetaldehyde**	**Benzene**	**Formaldehyde**	**Methanol**	**n-Hexane**	**Toluene**	**Total HAP**

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
Emissions Summary

HOH-1	lb/hr	2.09	3.96	1.65	0.98	0.98	0.11	8.11E-04	-	-	-	-	-	0.01	-	0.28	-	0.29
HOH-2	lb/hr	2.09	3.96	1.65	0.98	0.98	0.11	8.11E-04	-	-	-	-	-	0.01	-	0.28	-	0.29
DHR-1	lb/hr	0.007	0.13	0.11	0.010	0.010	0.001	8.11E-06	-	-	-	-	-	-	-	0.003	-	0.003
DHR-2	lb/hr	0.007	0.13	0.11	0.010	0.010	0.001	8.11E-06	-	-	-	-	-	-	-	0.003	-	0.003
STABHR-1	lb/hr	0.10	0.55	0.57	0.13	0.13	0.01	1.11E-04	-	-	-	-	-	0.002	-	0.04	-	0.04
CE-1	lb/hr	1.09	1.37	1.14	0.16	0.16	0.01	1.20E-04	0.04	-	-	0.03	0.007	0.14	0.04	0.02	0.007	0.28
CE-2	lb/hr	1.09	1.37	1.14	0.16	0.16	0.01	1.20E-04	0.04	-	-	0.03	0.007	0.14	0.04	0.02	0.007	0.28
CE-3	lb/hr	1.09	1.37	1.14	0.16	0.16	0.01	1.20E-04	0.04	-	-	0.03	0.007	0.14	0.04	0.02	0.007	0.28
CE-4	lb/hr	1.09	1.37	1.14	0.16	0.16	0.01	1.20E-04	0.04	-	-	0.03	0.007	0.14	0.04	0.02	0.007	0.28
CE-5	lb/hr	1.09	1.37	1.14	0.16	0.16	0.01	1.20E-04	0.04	-	-	0.03	0.007	0.14	0.04	0.02	0.007	0.28
CE-6	lb/hr	1.09	1.37	1.14	0.16	0.16	0.01	1.20E-04	0.04	-	-	0.03	0.007	0.14	0.04	0.02	0.007	0.28
CE-7	lb/hr	1.09	1.37	1.14	0.16	0.16	0.01	1.20E-04	0.04	-	-	0.03	0.007	0.14	0.04	0.02	0.007	0.28
CE-8	lb/hr	0.96	1.52	0.76	0.11	0.11	0.008	8.32E-05	0.001	-	-	0.01	0.003	0.18	0.02	0.007	0.003	0.24
CE-9	lb/hr	0.96	1.52	0.76	0.11	0.11	0.008	8.32E-05	0.001	-	-	0.01	0.003	0.18	0.02	0.007	0.003	0.24
CE-10	lb/hr	0.96	1.52	0.76	0.11	0.11	0.008	8.32E-05	0.001	-	-	0.01	0.003	0.18	0.02	0.007	0.003	0.24
CE-11	lb/hr	0.96	1.52	0.76	0.11	0.11	0.008	8.32E-05	0.001	-	-	0.01	0.003	0.18	0.02	0.007	0.003	0.24
CE-12	lb/hr	0.96	1.52	0.76	0.11	0.11	0.008	8.32E-05	0.001	-	-	0.01	0.003	0.18	0.02	0.007	0.003	0.24
TURB-1	lb/hr	1.74	2.97	3.51	0.34	0.34	0.002	-	0.12	-	-	0.002	-	0.04	-	-	0.007	0.05
TURB-2	lb/hr	1.74	2.97	3.51	0.34	0.34	0.002	-	0.12	-	-	0.002	-	0.04	-	-	0.007	0.05
TURB-3	lb/hr	1.74	2.97	3.51	0.34	0.34	0.002	-	0.12	-	-	0.002	-	0.04	-	-	0.007	0.05
TURB-4	lb/hr	1.74	2.97	3.51	0.34	0.34	0.002	-	0.12	-	-	0.002	-	0.04	-	-	0.007	0.05
TURB-5	lb/hr	1.74	2.97	3.51	0.34	0.34	0.002	-	0.12	-	-	0.002	-	0.04	-	-	0.007	0.05
TURB-6	lb/hr	Backup for TURB 1 - TURB-5																
FUG	lb/hr	14.50	-	-	-	-	-	0.61	8.65			-	0.26	-	-	0.52	0.12	0.94
AGFL-1	lb/hr	0.008	0.30	1.20	0.02	0.02	5.39	0.06	0.39	-	-	-	-	-	-	-	-	-
AGFL-1 SSM	lb/hr	9.03	100.73	401.16	5.44	5.44	3525.57	38.28	454.54			-	0.05	-	-	-	0.004	0.05
FL-1	lb/hr	0.87	1.74	3.48	0.09	0.09	6.76	0.07	3.58	-	-	-	0.01	-	-	0.02	0.009	0.04
FL-1 SSM	lb/hr	173.52	93.73	187.13	5.06	5.06	1426.60	15.18	215.17			-	2.40	-	-	3.39	1.90	8.42
DHY-1 SSM	lb/hr	49.77	-	-	-	-	-	0.07	200.87			-	5.94	-	-	0.38	1.04	7.45
DHY-2 SSM	lb/hr	49.77	-	-	-	-	-	0.07	200.87			-	5.94	-	-	0.38	1.04	7.45
TK-1	lb/hr	0.68	-	-	-	-	-	0.01	0.002			-	0.009	-	-	0.02	0.004	0.03
TK-2	lb/hr	0.68	-	-	-	-	-	0.01	0.002			-	0.009	-	-	0.02	0.004	0.03
TK-3	lb/hr	0.07	-	-	-	-	-	6.63E-11	3.63E-16			-	0.002	-	-	0.004	-	0.006
TK-4	lb/hr	0.07	-	-	-	-	-	6.63E-11	3.63E-16			-	0.002	-	-	0.004	-	0.006
TK-5	lb/hr	0.07	-	-	-	-	-	6.63E-11	3.63E-16			-	0.002	-	-	0.004	-	0.006
TK-6	lb/hr	0.07	-	-	-	-	-	6.63E-11	3.63E-16			-	0.002	-	-	0.004	-	0.006
TK-TRI	lb/hr	0.22	-	-	-	-	-	2.32E-05	1.63			-	-	-	-	-	-	0.003
LOADTRI	lb/hr	0.007	-	-	-	-	-	4.94E-05	-			-	-	-	-	-	-	0.007
LOAD1	lb/hr	0.72	-	-	-	-	-	0.04	-			-	0.04	-	-	0.09	0.02	0.16
LOAD2	lb/hr	0.53	-	-	-	-	-	5.76E-10	-			-	0.02	-	-	0.03	0.004	0.05
ROAD	lb/hr	-	-	-	0.34	0.03	-	-	-	-	-	-	-	-	-	-	-	-
SSMBD COMP	lb/hr	232.07	-	-	-	-	-	0.002	453.38	-	-	-	0.23	-	-	0.31	0.03	0.57
SSMBD DEHY	lb/hr	272.07	-	-	-	-	-	0.002	530.86	-	-	-	0.30	-	-	0.37	0.03	0.70
SSMBD Filters	lb/hr	46.41	-	-	-	-	-	3.07E-04	90.68	-	-	-	0.05	-	-	0.06	0.005	0.11
SSMBD PIPE	lb/hr	1160.36	-	-	-	-	-	0.008	2266.88	-	-	-	1.15	-	-	1.57	0.13	2.86
Total	**lb/hr**	**2,027.97**	**143.54**	**439.26**	**11.41**	**10.73**	**3,538.08**	**39.23**	**4,213.18**	1.43	0.00	**0.28**	**16.44**	**2.09**	**0.37**	**7.94**	**4.43**	**32.90**
Total minus Fugitives	**lb/hr**	**2,013.47**	**143.54**	**439.26**	**11.41**	**10.73**	**3,538.08**	**38.62**	**4,204.54**	#REF!	#REF!	**0.28**	**16.17**	**2.09**	**0.37**	**7.42**	**4.32**	**31.97**

PLANT #2 EMISSIONS																		
		VOC	**NOx**	**CO**	**PM10**	**PM2.5**	**SO2**	**H2S**	**Methane**	**CO2**	**N2O**	**Acetaldehyde**	**Benzene**	**Formaldehyde**	**Methanol**	**n-Hexane**	**Toluene**	**Total HAP**
Total	**lb/hr**	**2,027.97**	**143.54**	**439.26**	**11.41**	**11.10**	**3,538.08**	**39.23**	**4,213.18**	#REF!	#REF!	**0.28**	**16.44**	**2.09**	**0.37**	**7.94**	**4.43**	**32.90**
Total minus Fugitives	**lb/hr**	**2,013.47**	**143.54**	**439.26**	**11.41**	**11.10**	**3,538.08**	**38.62**	**4,204.54**	#REF!	#REF!	**0.28**	**16.17**	**2.09**	**0.37**	**7.42**	**4.32**	**31.97**
Total	**TPY**	**234.54**	**201.52**	**209.04**	**26.74**	**25.55**	**216.39**	**5.18**	**194.66**	**241,617.37**	**0.26**	**1.24**	**2.84**	**9.14**	**1.61**	**6.27**	**1.28**	**24.35**
Total minus Fugitives	**TPY**	**171.05**	**201.52**	**209.04**	**26.74**	**25.55**	**216.39**	**2.50**	**156.78**	**241,601.84**	**0.26**	**1.24**	**1.69**	**9.14**	**1.61**	**3.98**	**0.78**	**20.25**

1 SSM at AGFL-1 will not be conducted at the same time as FL-1 SSM. The higher of the two rates is included in the sum of hourly emissions.

2 The SSM streams flowing to AGFL-1 and FL-1 can occur at the same time as the streams occuring during normal operation.

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
Hot Oil Heater - Natural Gas

EMISSION POINT ID: HOH-1 & HOH-2

Stack Parameters	
Stack Height (ft):	**90**
Stack Diameter (ft):	**4.58**
Stack Temperature (F):	**1000**
Stack Velocity (fps):	**63.47**

Background Information	
Name	Hot Oil Heaters 1 & 2
Heater/Boiler rating (MMBtu/hr):	110.00
Rating above is:	below 100 MMBtu/hr,
Operating hours/year:	8760
Natural Gas Heat Value (Btu/scf)[a]:	1,020
Fuel Gas Heat Value (Btu/scf)[b]:	1,017
Max Permitted Fuel Gas Heat Value (Btu/scf):	1,220
Fuel Rate (scf/hr):	90,168
Fuel Rate (scf/yr):	789,871,212

a) Heating value for natural gas taken from Section 1.4 of AP-42 (dated 7/98).
#REF!

Pollutant	Emission Factor[a] (lb/MMBtu)	lb/hr[c]	tpy
VOC	0.019	2.09	9.15
NOx	0.036	3.96	17.34
CO	0.015	1.65	7.23
PM_{10}	7.6	0.98	4.29
$PM_{2.5}$	7.6	0.98	4.29
SO_2	0.001	0.11	0.47
CO2	117.00	15.09	66.10
Methane	0.002	2.84E-04	1.25E-03
HAPS	**Emission Factor[a] (lb/MMscf)**	**lb/hr[c]**	**tpy**
Arsenic	0.0002	3.10E-05	1.36E-04
Benzene	0.0021	3.25E-04	1.42E-03
Beryllium	0.000012	1.86E-06	8.14E-06
Cadmium	0.0011	1.70E-04	7.46E-04
Chromium	0.0014	2.17E-04	9.49E-04
Cobalt	0.000084	1.30E-05	5.69E-05
Dichlorobenzene	0.0012	1.86E-04	8.14E-04
Formaldehyde	0.075	0.01	0.05
n-Hexane	1.8	0.28	1.22
Lead	0.0005	7.74E-05	3.39E-04
Manganese	0.00038	5.88E-05	2.58E-04
Mercury	0.00026	4.02E-05	1.76E-04
Naphthalene	0.00061	9.44E-05	4.14E-04
Nickel	0.0021	3.25E-04	1.42E-03
POM	0.000088	1.36E-05	5.97E-05
Toluene	0.0034	5.26E-04	2.30E-03
Selenium	0.000024	3.71E-06	1.63E-05
Total HAP		**0.29**	**1.28**
Other Pollutants			
H_2S	N/A[c]	8.11E-04	3.55E-03

a) Emission factors are taken from AP-42, Chapter 1, Tables 1.4-1, 1.4-2, 1.4-3, and 1.4-4, dated July 1998. NOx, CO, VOC, and PM are from heater manufacturer.
b) H_2S emissions are conservatively based on 98% conversion of H_2S to SO_2.
c) lb/hr and TPY emissions rates adjusted for site specific fuel gas. AP-42 SO2 factor is based on 0.2 gr/100 scf.

Parameter	Value
scf/lbmole	379
Btu/MMBtu	1,000,000
scf/MMscf	1,000,000
lb/ton	2,000
H_2S MW	34.08
SO_2 MW	64.06

H_2S Max Concentration (ppmv)	H_2S Mass to Heater (lb/hr)	H_2S Mass to Heater (tpy)	Grains/100 scf
5.00	0.04	0.18	0.33

a) H_2S Mass to Heater Treater (lb/hr) = H_2S Max Concentration (ppmv) /10^6 * Fuel Rate (scf/hr) / Standard Molar Volume (scf/lbmol) * H_2S MW (lb/lbmol)
b) 15.05 ppm H2S = 1 gr/100 scf per the Sulfur Measurement Handbook

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
Hot Oil Heater - Natural Gas

EMISSION POINT ID: STABHR-1

Stack Parameters	
Stack Height (ft):	**21.33**
Stack Diameter (ft):	**2.00**
Stack Temperature (F):	**400**
Stack Velocity (fps):	**26.77**

Background Information	
Name	Stabilizer Heater
Heater/Boiler rating (MMBtu/hr):	15.00
Rating above is:	below 100 MMBtu/hr,
Operating hours/year:	8760
Natural Gas Heat Value (Btu/scf)[a]:	1,020
Fuel Gas Heat Value (Btu/scf)[b]:	1,017
Max Permitted Fuel Gas Heat Value (Btu/scf):	1,220
Fuel Rate (scf/hr):	12,296
Fuel Rate (scf/yr):	107,709,711

a) Heating value for natural gas taken from Section 1.4 of AP-42 (dated 7/98).

b) Heating value for fuel gas was taken from recent analysis.

Pollutant	Emission Factor[a] (lb/MMBtu)	lb/hr[c]	tpy
VOC	5.5	0.10	0.42
NOx	0.0368	0.55	2.42
CO	0.0377	0.57	2.48
PM_{10}	7.6	0.13	0.59
$PM_{2.5}$	7.6	0.13	0.59
SO_2	0.001	0.01	0.06
CO2	117.00	2.06	9.01
Methane	0.002	3.88E-05	1.70E-04
HAPS	**Emission Factor[a] (lb/MMscf)**	**lb/hr[c]**	**tpy**
Arsenic	0.0002	4.22E-06	1.85E-05
Benzene	0.0021	4.43E-05	1.94E-04
Beryllium	0.000012	2.53E-07	1.11E-06
Cadmium	0.0011	2.32E-05	1.02E-04
Chromium	0.0014	2.95E-05	1.29E-04
Cobalt	0.000084	1.77E-06	7.77E-06
Dichlorobenzene	0.0012	2.53E-05	1.11E-04
Formaldehyde	0.075	1.58E-03	6.93E-03
n-Hexane	1.8	0.04	0.17
Lead	0.0005	1.06E-05	4.62E-05
Manganese	0.00038	8.02E-06	3.51E-05
Mercury	0.00026	5.49E-06	2.40E-05
Naphthalene	0.00061	1.29E-05	5.64E-05
Nickel	0.0021	4.43E-05	1.94E-04
POM	0.000088	1.86E-06	8.14E-06
Toluene	0.0034	7.18E-05	3.14E-04
Selenium	0.000024	5.07E-07	2.22E-06
Total HAP		**0.04**	**0.17**
Other Pollutants			
H_2S	N/A[c]	1.11E-04	4.84E-04

a) Emission factors are taken from AP-42, Chapter 1, Tables 1.4-1, 1.4-2, 1.4-3, and 1.4-4, dated July 1998. NOx, CO, VOC, and PM are from heater manufacturer.

b) H_2S emissions are conservatively based on 98% conversion of H_2S to SO_2.

c) lb/hr and TPY emissions rates adjusted for site specific fuel gas. AP-42 SO2 factor is based on 0.2 gr/100 scf.

Parameter	Value
scf/lbmole	379
Btu/MMBtu	1,000,000
scf/MMscf	1,000,000
lb/ton	2,000
H_2S MW	34.08
SO_2 MW	64.06

H_2S Max Concentration (ppmv)	H_2S Mass to Heater (lb/hr)	H_2S Mass to Heater (tpy)	Grains/100 scf
5.00	5.53E-03	0.02	0.33

a) H_2S Mass to Heater Treater (lb/hr) = H_2S Max Concentration (ppmv) /10^6 * Fuel Rate (scf/hr) / Standard Molar Volume (scf/lbmol) * H_2S MW (lb/lbmol)

b) 15.05 ppm H2S = 1 gr/100 scf per the Sulfur Measurement Handbook

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
Dehydrator Reboiler - Natural Gas

Stack Parameters	
Stack Height (ft):	**18.7**
Stack Diameter (ft):	**1.10**
Stack Temperature (F):	**400**
Stack Velocity (fps):	**6.5**

EMISSION POINT ID: DHR-1 & DHR-2

Background Information	
Name	Dehydrator Glycol Reboilers 1 & 2
Heater/Boiler rating (MMBtu/hr):	1.1
Rating above is:	below 100 MMBtu/hr,
Operating hours/year:	8760
Natural Gas Heat Value (Btu/scf)[a]:	1,020
Fuel Gas Heat Value (Btu/scf)[b]:	1,017
Max Permitted Fuel Gas Heat Value (Btu/scf):	1,220
Fuel Rate (scf/hr):	902
Fuel Rate (scf/yr):	7,898,712

a) Heating value for natural gas taken from Section 1.4 of AP-42 (dated 7/98).
#REF!

Pollutant	Emission Factor[a] (lb/MMscf)	lb/hr[b]	tpy
VOC	5.5	7.09E-03	0.03
NOx	100	0.13	0.56
CO	84	0.11	0.47
PM_{10}	7.6	9.80E-03	0.04
$PM_{2.5}$	7.6	9.80E-03	0.04
SO_2	1.00	1.29E-03	5.63E-03
HAPS			
Arsenic	0.0002	3.10E-07	1.36E-06
Benzene	0.0021	3.25E-06	1.42E-05
Beryllium	0.000012	1.86E-08	8.14E-08
Cadmium	0.0011	1.70E-06	7.46E-06
Chromium	0.0014	2.17E-06	9.49E-06
Cobalt	0.000084	1.30E-07	5.69E-07
Dichlorobenzene	0.0012	1.86E-06	8.14E-06
Formaldehyde	0.075	1.16E-04	5.08E-04
n-Hexane	1.8	2.79E-03	0.01
Lead	0.0005	7.74E-07	3.39E-06
Manganese	0.00038	5.88E-07	2.58E-06
Mercury	0.00026	4.02E-07	1.76E-06
Naphthalene	0.00061	9.44E-07	4.14E-06
Nickel	0.0021	3.25E-06	1.42E-05
POM	0.000088	1.36E-07	5.97E-07
Toluene	0.0034	5.26E-06	2.30E-05
Selenium	0.000024	3.71E-08	1.63E-07
Total HAP		**2.92E-03**	**0.01**
Other Pollutants			
H_2S	N/A	8.11E-06	3.55E-05

a) Emission factors are taken from AP-42, Chapter 1, Tables 1.4-1, 1.4-2, 1.4-3, and 1.4-4, dated July 1998.
b) H_2S emissions are conservatively based on 98% conversion of H_2S to SO_2.
c) lb/hr and TPY emissions rates adjusted for site specific fuel gas. AP-42 SO2 factor is based on 0.2 gr/100 scf.

Parameter	Value
scf/lbmole	379
Btu/MMBtu	1,000,000
scf/MMscf	1,000,000
lb/ton	2,000
H_2S MW	34.08
SO_2 MW	64.06

H_2S Max Concentration (ppmv)	H_2S Mass to Heater (lb/hr)[a]	H_2S Mass to Heater (tpy)	Grains/100 scf[b]
5.00	4.05E-04	1.78E-03	0.33

[a] H_2S Mass to Heater Treater (lb/hr) = H_2S Max Concentration (ppmv) /10^6 * Fuel Rate (scf/hr) / Standard Molar Volume (scf/lbmol) * H_2S MW (lb/lbmol)
[b] 15.05 ppm H2S = 1 gr/100 scf per the Sulfur Measurement Handbook

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
Natural Gas-Fired Compressor Engines

EMISSION POINT ID: CE-1 to CE-7

Site Location

Engine Data

EPN	CE-1 - CE-7	
Name	Compressor Engine	
Manufacturer	Caterpillar	
Model Number	3606	
Serial Number	See table on right.	
Manufacture Date	See table on right.	
Last Rebuild Date	N/A	
Application	gas compression	
Ignition/Injection Timing	variable	
Horsepower:	2,065	Scf/hr
Fuel consumption (Btu/hp-hr):	7,892	13,359
Hours of operation per year:	8,760	MMscf/yr
Engine Type:	4 Stroke Lean-Burn	117.0

Discharge Parameters

Stack height (feet)	25
Stack diameter (feet)	2.00
Stack Temperature (°F)	775
Exit Velocity (fps)	68.44
Exhaust Flow (cfm)	12901

Method of Emission Control

	Yes/No
NSCR Catalyst	No
SCR Catalyst	No
JLCC Catalyst	No
Parameter Adjustment	No
Stratified Charge	No
Other (Specify)	AFRC, Oxi-Cat

Fuel Data

Fuel Type	field gas
Fuel Consumption (BTU/bhp-hr)	7,892
Heat Value (HHV)	1,220
Heat Value (LHV)	1,017
Sulfur Content (grains/100scf)	#REF!

Federal/State Standards

	Yes/No
NSPS Subpart JJJJ	See table on right
MACT Subpart ZZZZ	Yes
30 TAC, Chapter 117	No

Unit/EPN	Serial Number	Install Date	DOM	JJJJ applicability
CE-1	TBD	TBD	TBD	NSPS JJJJ
CE-2	TBD	TBD	TBD	NSPS JJJJ
CE-3	TBD	TBD	TBD	NSPS JJJJ
CE-4	TBD	TBD	TBD	NSPS JJJJ
CE-5	TBD	TBD	TBD	NSPS JJJJ
CE-6	TBD	TBD	TBD	NSPS JJJJ
CE-7	TBD	TBD	TBD	NSPS JJJJ

SO_2 Mass Balance calculation for sour gas fuel:

Fuel Heat Value (Btu/SCF)	1,219.95		
Fuel H_2S content (mol%)	0.00050	*Not sour	
SO_2 produced (lb/hr) =	0.01	H2S produced (lb/hr) =	0.000
SO_2 produced (tpy) =	0.05	H2S produced (tpy) =	0.001

MW H_2S = 34.08 grams/mole
MW SO_2 = 64.06 grams/mole
379.3 SCF/lb-mole

Calculation:
VOC (tpy) emissions: (g/hp-hr)*(%VOC)*(hp)*(8760hr/yr)/454/2000
CO (tpy) emissions: (g/hp-hr)*(hp)*(8760hr/yr)/454/2000
NOx (tpy) emissions: CO (tpy) emissions: (g/hp-hr)*(hp)*(8760hr/yr)/454/2000
For emission factors in terms of lb/MMBtu
(Emission factor) * (Fuel Consumption) * (Horsepower) * (Conversion factor)
(lb/MMBtu) * (Btu/hp-hr) * (hp) * (1 MMBtu/1,000,000 Btu)

Does the VOC emission factor being used below include formaldehyde? (pick Yes or No from list)	No

To Determine Emissions for *Air* Permitting

	If available, enter the test results or manufacturer's emission factors before control (g/hp-hr)	from AP-42: Table 3.2-1 2 stroke, lean-burn engine emission factors (lb/MMBtu)	Table 3.2-2 4 stroke, lean-burn engine emission factors (lb/MMBtu)	Table 3.2-3 4 stroke, rich burn engine emission factors (lb/MMBtu)	appropriate AP-42 factor	emission factor used	units	Uncontrolled lb/hr	Uncontrolled tpy	If present, enter the efficiency of any control device (as a %)	If present, enter the controlled emission factor (as g/hp-hr)	control factor used	lb/hr	tpy
VOC	0.19	0.12	0.118	0.0296	0.118	0.19	g/hp-hr	0.865	3.789	0.00	0.20	0.2	1.09	4.79
NOx	0.3	3.17	4.08	2.21	4.08	0.3	g/hp-hr	1.366	5.982		0.30	0.3	1.37	5.98
CO	2.15	0.386	0.317	3.72	0.317	2.15	g/hp-hr	9.788	42.872	88.37	0.25	88.4	1.14	4.99
PM_{10}		0.04831	0.0099871	0.01941	0.0099871	0.0099871	lb/MMBtu	0.163	0.713			0	0.16	0.71
$PM_{2.5}$		0.04831	0.0099871	0.01941	0.0099871	0.0099871	lb/MMBtu	0.163	0.713			0	0.16	0.71
SO_2												0	0.01	0.05
Formaldehyde	0.14	0.0552	0.0528	0.0205	0.0528	0.14	g/hp-hr	0.637	2.792	78.57	0.03	78.6	0.14	0.60
Benzene		0.00194	0.000404	0.00158	0.000404	0.000404	lb/MMBtu	0.007	0.029			0	0.01	0.03
Methane					0.002205	0.002205	lb/MMBtu	0.036	0.157				0.04	0.16
CO2											402	402	1,830.13	8,015.98
N2O					0.0001	0.0001	lb/MMBtu	0.002	0.007				0.002	0.01

Enter any notes here:	* Uncontrolled and controlled factors were obtained from the manufacturer. A safety factor (5.3%) was added to uncontrolled VOC emissions. If applicable, the VOC control factor was applied to all HAPs, except formaldehyde which has its own control efficiency. Acetaldehyde and acrolein utilize the formaldehyde control efficiency. Fuel is not sour, used conservative 5 ppm H2S fuel gas as fuel in lieu of AP-42 factors.

Calculation:
For emission factors in terms of g/hp-hr:
(Emission factor) * (Horsepower) / (Conversion factor)
(g/hp-hr) * (hp) / (453.59 g/lb)
For emission factors in terms of lb/MMBtu:
(Emission factor) * (Fuel Consumption) * (Horsepower) * (Conversion factor)
(lb/MMBtu) * (Btu/hp-hr) * (hp) * (1 MMBtu/1,000,000 Btu)

HAP Emission Calculations

Pollutant	4 Stroke Lean-Burn	Engines CE-1 - CE-7		Engines CE-1 - CE-7	
	AP-42 Table 3.2-2 Emission Factor (lb/MMBtu)	Emissions lb/hr	Emissions tpy	UC Emissions lb/hr	UC Emissions tpy
1,1,2,2-Tetrachloroethane	4.00E-05	6.52E-04	2.86E-03	6.52E-04	2.86E-03
1,1,2-Trichloroethane	3.18E-05	5.18E-04	2.27E-03	5.18E-04	2.27E-03
1,3-Butadiene	2.67E-04	4.35E-03	0.02	4.35E-03	0.02
1,3-Dichloropropene	2.64E-05	4.30E-04	1.88E-03	4.30E-04	1.88E-03
2,2,4-Trimethylbenzne	--	--	--	--	--
2-Methylnaphthalene	3.32E-05	5.41E-04	2.37E-03	5.41E-04	2.37E-03
2,2,4-Trimethylpentane	2.50E-04	4.07E-03	0.02	4.07E-03	0.02
Acenaphthene	1.25E-06	2.04E-05	8.92E-05	2.04E-05	8.92E-05
Acenaphthylene	5.53E-06	9.01E-05	3.95E-04	9.01E-05	3.95E-04
Acetaldehyde	0.01	0.03	0.13	0.14	0.60
Acrolein	0.01	0.02	0.08	0.08	0.37
Anthracene	--	--	--	--	--
Benz(a)anthracene	--	--	--	--	--
Benzene	4.40E-04	0.01	0.03	0.01	0.03
Benzo(a)pyrene	--	--	--	--	--
Benzo(b)flouanthene	1.66E-07	2.71E-06	1.18E-05	2.71E-06	1.18E-05
Benzo(e)pyrene	4.15E-07	6.76E-06	2.96E-05	6.76E-06	2.96E-05
Benzo(g,h,i)perylene	4.14E-07	6.75E-06	2.96E-05	6.75E-06	2.96E-05
Benzo(k)fluoranthene	--	--	--	--	--
Biphenyl	2.12E-04	3.45E-03	0.02	3.45E-03	0.02
Carbon Tetrachloride	3.67E-05	5.98E-04	2.62E-03	5.98E-04	2.62E-03
Chlorobenzene	3.04E-05	4.95E-04	2.17E-03	4.95E-04	2.17E-03
Chloroform	2.85E-05	4.64E-04	2.03E-03	4.64E-04	2.03E-03
Chrysene	6.93E-07	1.13E-05	4.95E-05	1.13E-05	4.95E-05
Ethylbenzene	3.97E-05	6.47E-04	2.83E-03	6.47E-04	2.83E-03
Ethylene Dibromide	4.43E-05	7.22E-04	3.16E-03	7.22E-04	3.16E-03
Flouranthene	1.11E-06	1.81E-05	7.92E-05	1.81E-05	7.92E-05
Flourene	5.67E-06	9.24E-05	4.05E-04	9.24E-05	4.05E-04
Formaldehyde	engine specific	0.14	0.60	0.64	2.79
Indeno(1,2,3-c,d)pyrene	--	--	--	--	--
Methanol	2.50E-03	0.04	0.18	0.04	0.18
Methylene Chloride	2.00E-05	3.26E-04	1.43E-03	3.26E-04	1.43E-03
n-Hexane	1.11E-03	0.02	0.08	0.02	0.08
Naphthalene	7.44E-05	1.21E-03	0.01	1.21E-03	0.01
PAH	2.69E-05	4.38E-04	1.92E-03	4.38E-04	1.92E-03
Perylene	--	--	--	--	--
Phenanthrene	1.04E-05	1.69E-04	7.42E-04	1.69E-04	7.42E-04
Phenol	2.40E-05	3.91E-04	1.71E-03	3.91E-04	1.71E-03
Pyrene	1.36E-06	2.22E-05	9.71E-05	2.22E-05	9.71E-05
Styrene	2.36E-05	3.85E-04	1.68E-03	3.85E-04	1.68E-03
Tetrachloroethane	2.48E-06	4.04E-05	1.77E-04	4.04E-05	1.77E-04
Toluene	4.08E-04	0.01	0.03	0.01	0.03
Vinyl Chloride	1.49E-05	2.43E-04	1.06E-03	2.43E-04	1.06E-03
Xylene	1.84E-04	3.00E-03	0.01	3.00E-03	0.01
Total HAPs Minus HCOH		**0.14**	**0.63**	**0.32**	**1.38**
Total HAP		**0.28**	**1.23**	**0.95**	**4.18**

2 Stroke Lean-Burn	4 Stroke Lean-Burn	4 Stroke Rich-Burn
AP-42 Table 3.2-1 Emission Factor (lb/MMBtu)	AP-42 Table 3.2-2 Emission Factor (lb/MMBtu)	AP-42 Table 3.2-3 Emission Factor (lb/MMBtu)
6.63E-05	4.00E-05	2.53E-05
5.27E-05	3.18E-05	1.53E-05
8.20E-04	2.67E-04	6.63E-04
4.38E-05	2.64E-05	1.27E-05
8.46E-04		
2.14E-05	3.32E-05	
	2.50E-04	
1.33E-06	1.25E-06	
3.17E-06	5.53E-06	
7.76E-03	8.36E-03	2.79E-03
7.78E-03	5.14E-03	2.63E-03
7.18E-07		
3.36E-07		
1.94E-03	4.40E-04	1.58E-03
5.68E-09		
8.51E-09	1.66E-07	
2.34E-08	4.15E-07	
2.48E-08	4.14E-07	
4.26E-09		
3.95E-06	2.12E-04	
6.07E-05	3.67E-05	1.77E-05
4.44E-05	3.04E-05	1.29E-05
4.71E-05	2.85E-05	1.37E-05
6.72E-07	6.93E-07	
1.08E-04	3.97E-05	2.48E-05
7.34E-05	4.43E-05	2.13E-05
3.61E-07	1.11E-06	
1.69E-06	5.67E-06	
5.52E-02	5.28E-02	2.05E-02
9.93E-09		
2.48E-03	2.50E-03	3.06E-03
1.47E-04	2.00E-05	4.12E-05
4.45E-04	1.11E-03	
9.63E-05	7.44E-05	9.71E-05
1.34E-04	2.69E-05	1.41E-04
4.97E-09		
3.53E-06	1.04E-05	
4.21E-05	2.40E-05	
5.84E-07	1.36E-06	
5.48E-05	2.36E-05	1.19E-05
	2.48E-06	
9.63E-04	4.08E-04	5.58E-04
2.47E-05	1.49E-05	7.18E-06
2.68E-04	1.84E-04	1.95E-04

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
Natural Gas-Fired Compressor Engine

EMISSION POINT ID: CE-8 to CE-12

Site Location

Engine Data

EPN	CE-8 - CE-12
Name	Compressor Engine
Manufacturer	Caterpillar
Model Number	3516
Serial Number	See table on right.
Manufacture Date	See table on right.
Last Rebuild Date	N/A
Application	gas compression
Ignition/Injection Timing	variable

Horsepower:	1,380	Scf/hr
Fuel consumption (Btu/hp-hr):	8,182	9,255
Hours of operation per year:	8,760	MMscf/yr
Engine Type:	4 Stroke Lean-Burn	81.1

Discharge Parameters

Stack height (feet)	25
Stack diameter (feet)	1.33
Stack Temperature (°F)	813
Exit Velocity (fps)	95.41
Exhaust Flow (cfm)	7953

Method of Emission Control

	Yes/No
NSCR Catalyst	No
SCR Catalyst	No
JLCC Catalyst	No
Parameter Adjustment	No
Stratified Charge	No
Other (Specify)	AFRC, Oxi-Cat

Fuel Data

Fuel Type	field gas
Fuel Consumption (BTU/bhp-hr)	8,182
Heat Value (HHV)	1,220
Heat Value (LHV)	1,017
Sulfur Content (grains/100scf)	#REF!

Federal/State Standards

	Yes/No
NSPS Subpart JJJJ	See table on right
MACT Subpart ZZZZ	Yes
30 TAC, Chapter 117	No

Unit/EPN	Serial Number	Install Date	DOM	JJJJ applicability
CE-8	TBD	TBD	TBD	NSPS JJJJ
CE-9	TBD	TBD	TBD	NSPS JJJJ
CE-10	TBD	TBD	TBD	NSPS JJJJ
CE-11	TBD	TBD	TBD	NSPS JJJJ
CE-12	TBD	TBD	TBD	NSPS JJJJ

SO_2 Mass Balance calculation for sour gas fuel:

		MW H_2S =	34.08	grams/mole
		MW SO_2 =	64.06	grams/mole
Fuel Heat Value (Btu/SCF)	1,219.95			
Fuel H_2S content (mol%)	0.00050	*Not sour	379	SCF/lb-mole

SO_2 produced (lb/hr) =	0.01	H2S produced (lb/hr) =	0.000
SO_2 produced (tpy) =	0.03	H2S produced (tpy) =	0.000

Calculation:

VOC (tpy) emissions: (g/hp-hr)*(%VOC)*(hp)*(8760hr/yr)/454/2000

CO (tpy) emissions: (g/hp-hr)*(hp)*(8760hr/yr)/454/2000

NOx (tpy) emissions: CO (tpy) emissions: (g/hp-hr)*(hp)*(8760hr/yr)/454/2000
For emission factors in terms of lb/MMBtu
(Emission factor) * (Fuel Consumption) * (Horsepower) * (Conversion factor)
(lb/MMBtu) * (Btu/hp-hr) * (hp) * (1 MMBtu/1,000,000 Btu)

Does the VOC emission factor being used below include formaldehyde? (pick Yes or No from list)	No

To Determine Emissions for Air Permitting

	If available, enter the test results or manufacturer's emission factors before control (g/hp-hr)	from AP-42: Table 3.2-1 2 stroke, lean-burn engine emission factors (lb/MMBtu)	Table 3.2-2 4 stroke, lean-burn engine emission factors (lb/MMBtu)	Table 3.2-3 4 stroke, rich burn engine emission factors (lb/MMBtu)	appropriate AP-42 factor	emission factor used	units	Uncontrolled lb/hr	Uncontrolled tpy	If present, enter the efficiency of any control device (as a %)	If present, enter the controlled emission factor (as g/hp-hr)	control factor used	lb/hr	tpy
VOC	0.43	0.12	0.118	0.0296	0.118	0.43	g/hp-hr	1.308	5.730	41.86	0.25	41.9	0.96	4.23
NOx	0.5	3.17	4.08	2.21	4.08	0.5	g/hp-hr	1.521	6.663		0.5	0.5	1.52	6.66
CO	2.02	0.386	0.317	3.72	0.317	2.02	g/hp-hr	6.146	26.918	87.62	0.25	87.6	0.76	3.33
PM_{10}		0.04831	0.0099871	0.01941	0.0099871	0.0099871	lb/MMBtu	0.113	0.494			0	0.11	0.49
$PM_{2.5}$		0.04831	0.0099871	0.01941	0.0099871	0.0099871	lb/MMBtu	0.113	0.494			0	0.11	0.49
SO_2												0	0.008	0.03
Formaldehyde	0.42	0.0552	0.0528	0.0205	0.0528	0.42	g/hp-hr	1.278	5.597	85.71	0.06	85.7	0.18	0.80
Benzene		0.00194	0.000404	0.00158	0.000404	0.000404	lb/MMBtu	0.005	0.020			0	0.005	0.02
Methane					0.0001	0.0001	lb/MMBtu	0.001	0.005				0.001	0.005
CO2											456	456	1,387.33	6,076.51
N2O					0.0001	0.0001	lb/MMBtu	0.001	0.005				0.001	0.00

Enter any notes here:	* Uncontrolled factors were obtained from the manufacturer and controlled factors were selected for operational flexibility. The VOC control factor was applied to all HAPs, except formaldehyde which has its own control efficiency and acetaldehyde and acrolein which utilize the formaldehyde control efficiency. Fuel is not sour, used conservative 5 ppm H2S fuel gas as fuel in lieu of AP-42 factors.

Calculation:
For emission factors in terms of g/hp-hr:
(Emission factor) * (Horsepower) / (Conversion factor)
(g/hp-hr) * (hp) / (453.59 g/lb)
For emission factors in terms of lb/MMBtu:
(Emission factor) * (Fuel Consumption) * (Horsepower) * (Conversion factor)
(lb/MMBtu) * (Btu/hp-hr) * (hp) * (1 MMBtu/1,000,000 Btu)

HAP Emission Calculations

Pollutant	4 Stroke Lean-Burn	Engines CE-8 - CE-12		Engines CE-8 - CE-12	
	AP-42 Table 3.2-2 Emission Factor (lb/MMBtu)	Emissions lb/hr	Emissions tpy	UC Emissions lb/hr	UC Emissions tpy
1,1,2,2-Tetrachloroethane	4.00E-05	2.63E-04	1.15E-03	4.52E-04	1.98E-03
1,1,2-Trichloroethane	3.18E-05	2.09E-04	9.14E-04	3.59E-04	1.57E-03
1,3-Butadiene	2.67E-04	1.75E-03	0.01	3.01E-03	0.01
1,3-Dichloropropene	2.64E-05	1.73E-04	7.59E-04	2.98E-04	1.31E-03
2,2,4-Trimethylbenzne	--	--	--	--	--
2-Methylnaphthalene	3.32E-05	2.18E-04	9.55E-04	3.75E-04	1.64E-03
2,2,4-Trimethylpentane	2.50E-04	1.64E-03	0.01	2.82E-03	0.01
Acenaphthene	1.25E-06	8.21E-06	3.59E-05	1.41E-05	6.18E-05
Acenaphthylene	5.53E-06	3.63E-05	1.59E-04	6.24E-05	2.73E-04
Acetaldehyde	0.01	0.01	0.06	0.09	0.41
Acrolein	0.01	0.01	0.04	0.06	0.25
Anthracene	--	--	--	--	--
Benz(a)anthracene	--	--	--	--	--
Benzene	4.40E-04	2.89E-03	0.01	4.97E-03	0.02
Benzo(a)pyrene	--	--	--	--	--
Benzo(b)flouanthene	1.66E-07	1.09E-06	4.77E-06	1.87E-06	8.21E-06
Benzo(e)pyrene	4.15E-07	2.72E-06	1.19E-05	4.69E-06	2.05E-05
Benzo(g,h,i)perylene	4.14E-07	2.72E-06	1.19E-05	4.67E-06	2.05E-05
Benzo(k)fluoranthene	--	--	--	--	--
Biphenyl	2.12E-04	1.39E-03	0.01	2.39E-03	0.01
Carbon Tetrachloride	3.67E-05	2.41E-04	1.06E-03	4.14E-04	1.82E-03
Chlorobenzene	3.04E-05	2.00E-04	8.74E-04	3.43E-04	1.50E-03
Chloroform	2.85E-05	1.87E-04	8.19E-04	3.22E-04	1.41E-03
Chrysene	6.93E-07	4.55E-06	1.99E-05	7.82E-06	3.43E-05
Ethylbenzene	3.97E-05	2.61E-04	1.14E-03	4.48E-04	1.96E-03
Ethylene Dibromide	4.43E-05	2.91E-04	1.27E-03	5.00E-04	2.19E-03
Flouranthene	1.11E-06	7.29E-06	3.19E-05	1.25E-05	5.49E-05
Flourene	5.67E-06	3.72E-05	1.63E-04	6.40E-05	2.80E-04
Formaldehyde	engine specific	0.18	0.80	1.28	5.60
Indeno(1,2,3-c,d)pyrene	--	--	--	--	--
Methanol	2.50E-03	0.02	0.07	0.03	0.12
Methylene Chloride	2.00E-05	1.31E-04	5.75E-04	2.26E-04	9.89E-04
n-Hexane	1.11E-03	0.01	0.03	0.01	0.05
Naphthalene	7.44E-05	4.88E-04	2.14E-03	8.40E-04	3.68E-03
PAH	2.69E-05	1.77E-04	7.73E-04	3.04E-04	1.33E-03
Perylene	--	--	--	--	--
Phenanthrene	1.04E-05	6.83E-05	2.99E-04	1.17E-04	5.14E-04
Phenol	2.40E-05	1.58E-04	6.90E-04	2.71E-04	1.19E-03
Pyrene	1.36E-06	8.93E-06	3.91E-05	1.54E-05	6.73E-05
Styrene	2.36E-05	1.55E-04	6.79E-04	2.66E-04	1.17E-03
Tetrachloroethane	2.48E-06	1.63E-05	7.13E-05	2.80E-05	1.23E-04
Toluene	4.08E-04	2.68E-03	0.01	4.61E-03	0.02
Vinyl Chloride	1.49E-05	9.78E-05	4.28E-04	1.68E-04	7.37E-04
Xylene	1.84E-04	1.21E-03	0.01	2.08E-03	0.01
Total HAPs Minus HCOH		**0.06**	**0.26**	**0.22**	**0.96**
Total HAP		**0.24**	**1.06**	**1.50**	**6.56**

2 Stroke Lean-Burn	4 Stroke Lean-Burn	4 Stroke Rich-Burn
AP-42 Table 3.2-1 Emission Factor (lb/MMBtu)	AP-42 Table 3.2-2 Emission Factor (lb/MMBtu)	AP-42 Table 3.2-3 Emission Factor (lb/MMBtu)
6.63E-05	4.00E-05	2.53E-05
5.27E-05	3.18E-05	1.53E-05
8.20E-04	2.67E-04	6.63E-04
4.38E-05	2.64E-05	1.27E-05
8.46E-04		
2.14E-05	3.32E-05	
	2.50E-04	
1.33E-06	1.25E-06	
3.17E-06	5.53E-06	
7.76E-03	8.36E-03	2.79E-03
7.78E-03	5.14E-03	2.63E-03
7.18E-07		
3.36E-07		
1.94E-03	4.40E-04	1.58E-03
5.68E-09		
8.51E-09	1.66E-07	
2.34E-08	4.15E-07	
2.48E-08	4.14E-07	
4.26E-09		
3.95E-06	2.12E-04	
6.07E-05	3.67E-05	1.77E-05
4.44E-05	3.04E-05	1.29E-05
4.71E-05	2.85E-05	1.37E-05
6.72E-07	6.93E-07	
1.08E-04	3.97E-05	2.48E-05
7.34E-05	4.43E-05	2.13E-05
3.61E-07	1.11E-06	
1.69E-06	5.67E-06	
5.52E-02	5.28E-02	2.05E-02
9.93E-09		
2.48E-03	2.50E-03	3.06E-03
1.47E-04	2.00E-05	4.12E-05
4.45E-04	1.11E-03	
9.63E-05	7.44E-05	9.71E-05
1.34E-04	2.69E-05	1.41E-04
4.97E-09		
3.53E-06	1.04E-05	
4.21E-05	2.40E-05	
5.84E-07	1.36E-06	
5.48E-05	2.36E-05	1.19E-05
	2.48E-06	
9.63E-04	4.08E-04	5.58E-04
2.47E-05	1.49E-05	7.18E-06
2.68E-04	1.84E-04	1.95E-04

Northwind Midstream Partners LLC
Titan Treater Plant Plant #2
Natural Gas-Fired Turbines

EMISSION POINT ID: TURB-1 - TURB-6

**** Note: TURB-6 is a backup to the other turbines. Only 5 may be operated at a time.**

Turbine Stack Parameters	
Stack height (feet)	20.0
Stack diameter (feet)	3.0
Stack Temperature (°F)	1000
Exit Velocity (fps)	98
Exhaust Flow (cfm)	41732

Background Information:

Turbine Data	
Manufacturer	Solar
Model[1]	T-60
Horsepower (hp)	6,370.0
Power (kW)	4,750
Fuel Consumption (Btu/hp-hr)	8,488
Method of emission control	SOLONOx
Hours of operation per year	8,760
Fuel Data	
Fuel type	Natural Gas
HHV (btu/scf)	1,219.9
Constants and Conversion Factors	
Horsepower per kilowatt (hp/kW)	1.3410
Grams per pound (g/lb)	453.59
SO_2 MW (lb/lb-mole)	64.06
Elemental Sulfur MW (lb/lb-mole)	32.066

There will be six (6) Solar T60 Turbines on site. One will be utilized as a spare. All six will never operate at the same time at the same time.

Manufacture Emission Factors

Pollutant	Uncontrolled Emission Factor (lb/MMbtu)	Percent Reduction by Emission Control Device	Controlled Emission Factor (lb/MMbtu)
NOx	0.0550	0%	0.0550
CO	0.0650	0%	0.0650
VOC (NMHC)	0.0322	0%	0.0322

Equations used:

A. (Uncontrolled Emission Factor, g/hp-hr) = (Uncontrolled Emission Factor (g/kW-hr) / (1.341 hp/kW)

*B. (Controlled Emission Factor, g/hp-hr) = (Uncontrolled Emission Factor, g/hp-hr) * (100% - Control Efficiency, %)*

C. (Controlled Emission Factor, lb/MMBtu) = (Controlled Emission Factor, g/hp-hr) x (1,000,000 Btu/MMBtu) / (Fuel Consumption, Btu/hp-hr) / (453.5924 g/lb)

Emission Calculations:

Pollutants	Emission Factor (g/hp-hr)/ (lb/Mmbtu)	Source of Emission Factor	Engine Emissions (per engine)	
			lb/hr	tpy
VOC	0.0322	Manuf. Specs	**1.74**	**7.63**
NO_x	0.0550	Manuf. Specs	**2.97**	**13.03**
CO	0.0650	Manuf. Specs	**3.51**	**15.39**
PM	6.30E-03	AP-42	**0.34**	**1.49**
PM_{10}	6.30E-03	AP-42	**0.34**	**1.49**
$PM_{2.5}$	6.30E-03	AP-42	**0.34**	**1.49**
SO_2	4.50E-05	AP-42	**2.43E-03**	**0.01**
METHANE	2.21E-03	40 CFR 98	**0.12**	**0.52**
CO2	117.00	40 CFR 98	**6326.10**	**27708.32**
N2O	2.21E-04	40 CFR 98	**0.01**	**0.05**
HAPs	**Emission Factor (lb/MMBtu)**	**Source of Emission Factor[1]**	**lb/hr**	**tpy**
Total HAP	--	--	**0.05**	**0.23**
1,3-Butadiene	4.30E-07	AP-42	**2.33E-05**	**1.02E-04**
Acetaldehyde	4.00E-05	AP-42	**2.16E-03**	**9.47E-03**
Acrolein	6.40E-06	AP-42	**3.46E-04**	**1.52E-03**
Benzene	1.20E-05	AP-42	**6.49E-04**	**2.84E-03**
Formaldehyde	7.10E-04	AP-42	**0**	**0.17**
Naphthalene	1.30E-06	AP-42	**7.03E-05**	**3.08E-04**
PAH	2.20E-06	AP-42	**1.19E-04**	**5.21E-04**
Toluene	1.30E-04	AP-42	**7.03E-03**	**0.03**
Xylenes	6.40E-05	AP-42	**3.46E-03**	**0.02**

[1]AP-42 emission factors from AP-42, Table3.1-2a, 3.1-2b and 3.1-3 (AP-42, Section 3.1 Stationary Gas Turbines)

Equations used:

1. (Pollutant Emissions, lb/hr) = (Pollutant Emission Factor, lb/MMBtu) x (Turbine Horsepower, hp) x (Fuel Consumption, Btu/hp-hr) / (1,000,000 Btu/MMBtu)

2. (Pollutant Emissions, tpy) = (Pollutant Emissions, lb/hr) x (Hours of Operation per Year, hr/yr) / (2,000 lb/ton)

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
Fugitive Emissions

EMISSION POINT: FUG

Emissions Estimate

Liquid Equipment/Service	Oil and Gas Production Operations Emission Factor[a] (Light Oil)	Oil and Gas Production Operations Emission Factor[a] (Gas)	Oil and Gas Production Operations Emission Factor[a] (Water/Oil)	Oil and Gas Production Operations Emission Factor[a] (Heavy Oil)	# Light Oil Components	# Gas Components	# Water/Oil Components	# Heavy Oil Components[a]	Reduction Factor[b]	Light Oil Service Hourly Emissions[c]	Gas Service Hourly Emissions[d]	Oil/Water Service Hourly Emissions[d]	Heavy Oil Service Hourly Emissions[d]
	(lb/hr/component)	(lb/hr/component)	(lb/hr/component)	(lb/hr/component)						(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
Connectors	0.000463	0.00044	0.000243	0.0000165	2640	5680		1630		1.22	2.50	0.00	0.03
Valves	0.0055	0.00992	0.000216	0.0000185	828	1360		515		4.55	13.49	0.00	0.01
Flanges	0.000243	0.00086	0.000006	0.00000086	840	2080		309		0.20	1.79	0.00	0.00
Pump Seals	0.02866	0.00529	0.000052	0.00113	38	0		18		1.09	0.00	0.00	0.02
Other	0.0165	0.0194	0.0309	0.0000683	24	69		18		0.40	1.34	0.00	0.00
Totals TOC										**7.47**	**19.12**	**0.00**	**0.06**

[a] Emission factors have been obtained from the TCEQ's website (Emissions Factors for Equipment Leak Fugitive Components; Addendum to RG-360, Table 4). Per Table 2-4, water streams greater than 99% water is considered negligible and those components are not included.

[b] If applicable, emission reductions for LDAR28MID obtained from APDG 6422V2. For flanges and connectors, all service types claim reductions. For valves, gas and light oil use 97%. For pumps, only light oil service claims a reduction.

[c] Controlled Short-Term ER (lb/hr) = (100% - Reduction Factor) *Σ(Number of Components * Emissions Factor [lb/hr/component]).

[d] Controlled Annual ER (tpy) = Controlled Short-Term ER (lb/hr) * 8,760 (hr/yr) / 2,000 (lb/ton).

Speciated Fugitve Emissions

Component	Light Oil[a] (lb/hr)	Light Oil[a] (ton/year)	Gas[b] (lb/hr)	Gas[b] (ton/year)	Oil/Water[c] (lb/hr)	Oil/Water[c] (ton/year)	Total (lb/hr)	Total (ton/year)
H2S	7.07E-09	3.09E-08	0.61	2.67	1.10E-03	4.81E-03	0.61	2.68
H2O	8.23E-17	3.61E-16	--	--	6.36E-04	2.79E-03	6.36E-04	2.79E-03
TEG	1.12E-14	4.92E-14	--	--	1.26E-14	5.54E-14	2.39E-14	1.05E-13
N2	--	--	0.42	1.84	1.23E-06	5.40E-06	0.42	1.84
CO2	2.10E-11	9.21E-11	3.55	15.53	1.18E-03	0.01	3.55	15.53
Methane	3.87E-14	1.70E-13	8.65	37.88	1.72E-04	7.54E-04	8.65	37.88
Ethane	1.96E-08	8.57E-08	3.49	15.30	2.03E-03	0.01	3.50	15.31
Propane	4.71E-05	2.06E-04	3.05	13.34	0.01	0.05	3.06	13.39
Isobutane	4.61E-03	0.02	0.53	2.32	4.87E-03	0.02	0.54	2.36
n-Butane	0.09	0.42	1.36	5.97	0.02	0.07	1.47	6.45
Isopentane	2.30	10.08	0.47	2.08	0.01	0.04	2.78	12.19
n-Pentane	2.92	12.77	0.46	2.00	0.01	0.03	3.38	14.81
i-Hexane	1.33	5.82	0.34	1.50	4.25E-03	0.02	1.68	7.34
Heptane	0.19	0.83	0.23	1.00	1.15E-03	0.01	0.42	1.83
Octane	0.03	0.15	0.15	0.67	2.87E-04	1.26E-03	0.19	0.83
Nonane	1.89E-03	0.01	0.03	0.14	2.02E-05	8.86E-05	0.03	0.15
n-Decane	1.71E-04	7.47E-04	0.01	0.05	2.18E-06	9.53E-06	0.01	0.05
n-Hexane	0.38	1.69	0.14	0.60	1.44E-03	0.01	0.52	2.29
Benzene	0.17	0.73	0.10	0.42	7.44E-04	3.26E-03	0.26	1.16
Toluene	0.04	0.17	0.08	0.33	3.19E-04	1.40E-03	0.12	0.51
Ethylbenzene	1.83E-03	0.01	0.01	0.05	1.95E-05	8.53E-05	0.01	0.06
o-Xylene	2.03E-03	0.01	0.02	0.08	2.58E-05	1.13E-04	0.02	0.09
MDEA	1.41E-09	6.19E-09	--	--	1.97E-07	8.63E-07	1.98E-07	8.69E-07
Piperazine	1.99E-10	8.71E-10	--	--	4.12E-10	1.80E-09	6.11E-10	2.67E-09
Total	**7.47**	**32.70**	**23.69**	**103.77**	**0.06**	**0.27**	**31.22**	**136.74**
Total TOC	**7.47**	**32.70**	**19.12**	**83.74**	**0.06**	**0.26**	**26.64**	**116.69**
Percent VOC in TOC	**1.00**	**1.00**	**0.36**	**0.36**	**0.96**	**0.96**	**0.54**	**0.54**
VOC	**7.47**	**32.70**	**6.97**	**30.55**	**0.06**	**0.25**	**14.50**	**63.49**
Total HAP	**0.60**	**2.61**	**0.34**	**1.48**	**2.55E-03**	**0.01**	**0.94**	**4.10**

Light Oil TOC wt%	100.00	Condensate Emissions P2
Gas TOC wt%	80.69	Site Inlet P2
Oil/Water TOC wt%	95.24	Slop Tank Emissions P2

[a] Light Oil Speciated Fugitive Emissions Composition obtained from NGL Stream.

[b] Gas Speciated Fugitive Emissions Composition obtained from gas stream exiting the inlet slug catcher.

[c] Water/Oil Speciated Fugitive Emissions Composition obtained from Slop Oil inlet stream.

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
Slop Tanks

SOURCE: TK-1, TK-2

Identification - Vertical Fixed Roof Tanks		
	Tank ID	TK-1, TK-2
	Throughput (BPD)	454.5
	Throughput (BPY)	165,875
Tank Dimensions		
	Shell Height (ft)	20.0
	Diameter (ft)	12.0
	Volume (gal)	16,800
	Turnovers[a]	484.34
	Net Throughput (gal/yr)	6,966,755
Other Inputs		
	Shell & Roof Color/Shade	Tan
	Shell & Roof Condition	Tan
	Meteorological Data	Midland/Odessa
Tank Contents		
	Liquid TVP[b]	11.8
	Water, Mole %	99.6%
Total Uncontrolled Tank VOC Emissions		
	VOC Working & Breathing Losses (ton/yr)[b]	24.44
	VOC Flashing Losses (ton/yr)[b]	274.01
	Total Uncontrolled VOC Losses (ton/yr)[b]	298.45
Tank Collection Efficiency		
	Collection Efficiency[c]	100%
Tank Control		
	VRU Uptime	98%

NSPS OOOO/OOOOa/b Evaluation	
# of Tanks	2
Event	VOC Rate (tpy)
Tank Emissions	298.45
Controlled by VRUs	--
VRU Downtime	5.97
Total Emissions	304.41
Emissions Per Tank	152.21
Per Tank Threshold	6.00

*Threshold obtained from 60.5365(e) and 60.5365a(e).

[a] Turnovers calculated using equation 1-30 of AP-42, Chapter 7, assuming a maximum fill height of 90% of the tank shell height.

[b] From Promax AP-42 Emissions Report - Maximum value.

[c] Tank vapors are routed to redundant vapor recovery units for 98% of the year.

Uncontrolled Speciated Slop Tanks Emissions

	Hourly Emissions, lb/hr			Annual Emissions, TPY		
Component	**Working & Standing**	**Flash**	**Total**	**Working & Standing**	**Flash**	**Total**
H2S	0.18	1.15	1.33	0.80	5.04	5.85
H2O	0.09	0.68	0.77	0.41	2.98	3.39
TEG	1.24E-12	1.41E-11	1.54E-11	5.45E-12	6.18E-11	6.73E-11
N2	5.04E-06	1.49E-03	1.50E-03	2.21E-05	0.01	0.01
CO2	0.17	1.26	1.43	0.75	5.53	6.27
Methane	1.50E-03	0.21	0.21	0.01	0.91	0.92
Ethane	0.03	2.44	2.47	0.15	10.67	10.82
Propane	0.28	12.91	13.19	1.24	56.55	57.79
Isobutane	0.26	5.66	5.92	1.15	24.78	25.94
n-Butane	1.24	18.40	19.64	5.43	80.61	86.04
Isopentane	1.34	8.92	10.26	5.88	39.05	44.93
n-Pentane	1.18	7.90	9.08	5.17	34.62	39.79
i-Hexane	0.66	4.51	5.17	2.90	19.74	22.64
Heptane	0.17	1.22	1.40	0.76	5.36	6.12
Octane	0.04	0.31	0.35	0.18	1.35	1.53
Nonane	2.90E-03	0.02	0.02	0.01	0.09	0.11
n-Decane	3.05E-04	2.34E-03	2.65E-03	1.34E-03	0.01	0.01
n-Hexane	0.22	1.53	1.75	0.97	6.69	7.66
Benzene	0.12	0.79	0.90	0.51	3.45	3.96
Toluene	0.05	0.34	0.39	0.21	1.48	1.70
Ethylbenzene	2.87E-03	0.02	0.02	0.01	0.09	0.10
o-Xylene	3.79E-03	0.03	0.03	0.02	0.12	0.14
MDEA	3.39E-05	2.06E-04	2.39E-04	1.49E-04	9.00E-04	1.05E-03
Piperazine	4.67E-08	4.54E-07	5.01E-07	2.04E-07	1.99E-06	2.19E-06
Total	**6.06**	**68.30**	**74.36**	**26.55**	**299.14**	**325.69**
VOC	**5.58**	**62.56**	**68.14**	**24.44**	**274.01**	**298.45**
Total HAP	**0.39**	**2.70**	**3.10**	**1.72**	**11.84**	**13.56**

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
Triazine Tanks

SOURCE: TKTRI

Identification - Vertical Fixed Roof Tanks		
	Tank ID	TKRI
	Throughput (BPD)	200.0
	Throughput (BPY)	73,000
Tank Dimensions		
	Shell Height (ft)	20.0
	Diameter (ft)	12.0
	Volume (gal)	16,800
	Turnovers[a]	213.15
	Net Throughput (gal/yr)	3,065,998
Other Inputs		
	Shell & Roof Color/Shade	Tan
	Shell & Roof Condition	Tan
	Meteorological Data	Midland/Odessa
Tank Contents		
	Liquid TVP[b]	12.4
Total Uncontrolled Tank VOC Emissions		
	VOC Working & Breathing Losses (ton/yr)[b]	0.07
	VOC Flashing Losses (ton/yr)[b]	0.90
	Total Uncontrolled VOC Losses (ton/yr)[b]	0.97
Tank Collection Efficiency		
	Collection Efficiency	0%
Tank Control		
	No Control	0%

NSPS OOOO/OOOOa/b Evaluation	
# of Tanks	2
Event	VOC Rate (tpy)
Tank Emissions	0.97
Controlled by VRUs	--
VRU Downtime	--
Total Emissions	0.97
Emissions Per Tank	0.49
Per Tank Threshold	6.00

*Threshold obtained from 60.5365(e) and 60.5365a(e).

[a] Turnovers calculated using equation 1-30 of AP-42, Chapter 7, assuming a maximum fill height of 90% of the tank shell height.

[b] From Promax AP-42 Emissions Report - Maximum value.

Uncontrolled Speciated Tanks Emissions

	Hourly Emissions, lb/hr			Annual Emissions, TPY		
Component	**Working & Standing**	**Flash**	**Total**	**Working & Standing**	**Flash**	**Total**
H2S	8.10E-06	1.51E-05	2.32E-05	3.55E-05	6.61E-05	1.02E-04
H2O	0.04	0.10	0.14	0.20	0.44	0.63
TEG	--	--	--	--	--	--
N2	4.69E-04	0.04	0.04	2.05E-03	0.18	0.18
CO2	0.84	1.55	2.39	3.69	6.79	10.48
Methane	0.05	1.58	1.63	0.23	6.90	7.13
Ethane	0.03	0.34	0.37	0.12	1.49	1.61
Propane	0.01	0.14	0.16	0.05	0.63	0.68
Isobutane	7.63E-04	0.01	0.01	3.34E-03	0.05	0.06
n-Butane	3.62E-03	0.04	0.04	0.02	0.17	0.19
Isopentane	2.85E-04	3.61E-03	3.90E-03	1.25E-03	0.02	0.02
n-Pentane	1.68E-04	3.90E-03	4.06E-03	7.37E-04	0.02	0.02
i-Hexane	--	--	--	--	--	--
Heptane	3.82E-06	1.11E-04	1.15E-04	1.67E-05	4.88E-04	5.05E-04
Octane	--	--	--	--	--	--
Nonane	--	--	--	--	--	--
n-Decane	--	--	--	--	--	--
n-Hexane	--	--	--	--	--	--
Benzene	3.92E-05	7.91E-05	1.18E-04	1.72E-04	3.46E-04	5.18E-04
Toluene	--	--	--	--	--	--
Ethylbenzene	7.66E-04	1.58E-03	2.34E-03	3.36E-03	0.01	0.01
o-Xylene	1.57E-04	3.24E-04	4.81E-04	6.89E-04	1.42E-03	2.11E-03
Triazine, MEA	3.27E-15	1.81E-14	2.14E-14	1.43E-14	7.95E-14	9.38E-14
Piperazine	1.60E-11	4.66E-11	6.26E-11	7.01E-11	2.04E-10	2.74E-10
Total	**0.98**	**3.81**	**4.80**	**4.30**	**16.71**	**21.01**
VOC	**0.02**	**0.21**	**0.22**	**0.07**	**0.90**	**0.97**
Total HAP	**9.63E-04**	**1.98E-03**	**2.94E-03**	**4.22E-03**	**0.01**	**0.01**

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
Condensate Tanks

SOURCE: TK-3 TO TK-6

Identification - Vertical Fixed Roof Tanks		
	Tank ID	TK-3 to TK-6
	Throughput (BPD)	4,104.6
	Throughput (BPY)	1,498,184
Tank Dimensions		
	Shell Height (ft)	30.0
	Diameter (ft)	15.5
	Volume (gal)	31,500
	Turnovers[a]	1,714.39
	Net Throughput (gal/yr)	62,923,714
Other Inputs		
	Shell & Roof Color/Shade	Tan
	Shell & Roof Condition	Tan
	Meteorological Data	Midland/Odessa
Tank Contents		
	Liquid TVP[b]	4.3
	Water, Mole %	0.0%
Total Uncontrolled Tank VOC Emissions		
	VOC Working & Breathing Losses (ton/yr)[b]	61.38
	VOC Flashing Losses (ton/yr)[b]	0.00
	Total Uncontrolled VOC Losses (ton/yr)[b]	61.38
Tank Collection Efficiency		
	Collection Efficiency[c]	100%
Tank Control		
	VRU Uptime	98%

[a] Turnovers calculated using equation 1-30 of AP-42, Chapter 7, assuming a maximum fill height of 90% of the tank shell height.

[b] From Promax AP-42 Emissions Report - Maximum value.

[c] Tank vapors are routed to vapor recovery for 98% of the year.

20.2.50 Applicability	
# of Tanks	4
Event	VOC Rate (tpy)
Tank Emissions	61.38
Controlled by VRUs	--
VRU Downtime	1.23
Total Emissions	62.61
Emissions Per Tank	15.65
Per Tank Threshold	6.00

*Threshold obtained from 60.5365(e) and 60.5365a(e).

Uncontrolled Speciated Condensate Tanks Emissions

	Hourly Emissions, lb/hr			Annual Emissions, TPY		
Component	**Working & Standing**	**Flash**	**Total**	**Working & Standing**	**Flash**	**Total**
H2S	1.33E-08	--	1.33E-08	5.81E-08	--	5.81E-08
H2O	1.55E-16	--	1.55E-16	6.77E-16	--	6.77E-16
TEG	2.11E-14	--	2.11E-14	9.24E-14	--	9.24E-14
N2	--	--	--	--	--	--
CO2	3.94E-11	--	3.94E-11	1.73E-10	--	1.73E-10
Methane	7.27E-14	--	7.27E-14	3.18E-13	--	3.18E-13
Ethane	3.67E-08	--	3.67E-08	1.61E-07	--	1.61E-07
Propane	8.84E-05	--	8.84E-05	3.87E-04	--	3.87E-04
Isobutane	0.01	--	0.01	0.04	--	0.04
n-Butane	0.18	--	0.18	0.78	--	0.78
Isopentane	4.32	--	4.32	18.91	--	18.91
n-Pentane	5.47	--	5.47	23.98	--	23.98
i-Hexane	2.49	--	2.49	10.92	--	10.92
Heptane	0.36	--	0.36	1.56	--	1.56
Octane	0.06	--	0.06	0.28	--	0.28
Nonane	3.55E-03	--	3.55E-03	0.02	--	0.02
n-Decane	3.20E-04	--	3.20E-04	1.40E-03	--	1.40E-03
n-Hexane	0.72	--	0.72	3.17	--	3.17
Benzene	0.31	--	0.31	1.37	--	1.37
Toluene	0.07	--	0.07	0.32	--	0.32
Ethylbenzene	3.43E-03	--	3.43E-03	0.02	--	0.02
o-Xylene	3.81E-03	--	3.81E-03	0.02	--	0.02
MDEA	2.65E-09	--	2.65E-09	1.16E-08	--	1.16E-08
Piperazine	3.73E-10	--	3.73E-10	1.63E-09	--	1.63E-09
Total	**14.01**	**--**	**14.01**	**61.38**	**--**	**61.38**
VOC	**14.01**	**--**	**14.01**	**61.38**	**--**	**61.38**
Total HAP	**1.12**	**--**	**1.12**	**4.89**	**--**	**4.89**

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
Slop Loading

EMISSION POINT: LOAD-1

Hourly	
Saturation Factor, S[b]	0.6
Number of Loading Arms	1
Produced Water Reduction (%)[g]	99%
Max True Vapor Pressure, P[a] (psia)	13.260
Molecular Weight of Vapors, M[a] (lb/lb-mol)	55.0
Max Temp of Loaded Liquid[a], T (°F)	95.00
Emission Factor[b] (lb/10^3 gal)	9.83
Estimated Hourly Throughput[c] (gal/hr)	8,000
Total Uncontrolled Hourly Emissions[d] (lb/hr)	0.79
Collection Efficiency (%)	0.0%
Loading Fugitive Hourly Emissions[e] (lb/hr)	0.79
Maximum Hourly Gas to Control Device[f]	--

Annual	
Saturation Factor, S[b]	0.6
Number of Loading Arms	1
Produced Water Reduction (%)[g]	99%
True Vapor Pressure, P[a] (psia)	11.753
Molecular Weight of Vapors, M[a] (lb/lb-mol)	55.0
Temp of Loaded Liquid[a], T (°F)	65.32
Emission Factor[b] (lb/10^3 gal)	9.21
Estimated Annual Throughput[c] (gal/yr)	6,832,914
Total Uncontrolled Annual Emissions[d] (tpy)	0.31
Collection Efficiency (%)	0.0%
Loading Fugitive Annual Emissions (tpy)	0.31
Maximum Annual Gas to Control Device[f] (tpy)	--

[a] Estimated by ProMax.

[b] Per AP-42, 5th Edition (6/08), Section 5.2, Equation 1

$$\text{Emission Factor (lb/10}^3\text{gal)} = \frac{S \times P \times M \times 12.46}{T + 460}$$

Saturation Factor = 0.6

[c] Assumes liquid can be loaded at a maximum of 8,000 gal/hour per truck. Annual rates are based on production rate.

[d] Emissions (lb/hr) = Hourly Throughput (gal/hr) / 1000 x Emission Factor (lb/10^3 gal)

[e] Loading Fugitive Emissions (lb/hr) = Uncontrolled Hourly Emissions (lb/hr) x (100% - 0% control efficiency)

[f] Maximum Hourly to Control (lb/hr) = Uncontrolled Hourly Emissions (lb/hr) x 0% control efficiency.

[g] If applicable, percent Reduction for Produced Water Tank Calc. as Oil/Cond. Tank calculated using condensate properties with a produced water throughput.

Speciated Loading Emissions

Loading Fugitive VOC Emissions (EPN LOAD1)

Component	**lb/hr**	**ton/year**
Promax Stream Name	**Slop Load Composition P2**	**Slop Load Composition P2**
H2S	0.036	0.015
H2O	0.03	0.01
TEG	3.44E-13	1.37E-13
N2	--	--
CO2	--	--
Methane	--	--
Ethane	--	--
Propane	--	--
Isobutane	--	--
n-Butane	--	--
Isopentane	0.02	0.01
n-Pentane	0.18	0.07
i-Hexane	0.25	0.10
Heptane	0.09	0.03
Octane	0.02	0.01
Nonane	1.55E-03	6.20E-04
n-Decane	1.53E-04	6.13E-05
n-Hexane	0.09	0.04
Benzene	0.04	0.02
Toluene	0.02	0.01
Ethylbenzene	1.32E-03	5.27E-04
o-Xylene	1.73E-03	6.93E-04
MDEA	1.13E-05	4.53E-06
Piperazine	1.37E-08	5.49E-09
Total	**0.79**	**0.31**
VOC	**0.72**	**0.29**
Total HAP	**0.16**	**0.06**

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
Condensate Loading

EMISSION POINT: LOAD-2

Hourly	
Saturation Factor, S[b]	0.6
Number of Loading Arms	1
Produced Water Reduction (%)[g]	0%
Max True Vapor Pressure, P[a] (psia)	5.030
Molecular Weight of Vapors, M[a] (lb/lb-mol)	75.6
Max Temp of Loaded Liquid[a], T (°F)	95.00
Emission Factor[b] (lb/10^3 gal)	5.12
Estimated Hourly Throughput[c] (gal/hr)	8,000
Total Uncontrolled Hourly Emissions[d] (lb/hr)	41.00
Collection Efficiency (%)	98.7%
Loading Fugitive Hourly Emissions[e] (lb/hr)	0.53
Maximum Hourly Gas to Control Device[f]	40.46

Annual	
Saturation Factor, S[b]	0.6
Number of Loading Arms	1
Produced Water Reduction (%)[g]	0%
True Vapor Pressure, P[a] (psia)	4.311
Molecular Weight of Vapors, M[a] (lb/lb-mol)	75.6
Temp of Loaded Liquid[a], T (°F)	65.32
Emission Factor[b] (lb/10^3 gal)	4.64
Estimated Annual Throughput[c] (gal/yr)	51,699,255
Total Uncontrolled Annual Emissions[d] (tpy)	119.94
Collection Efficiency (%)	98.7%
Loading Fugitive Annual Emissions (tpy)	1.56
Maximum Annual Gas to Control Device[f] (tpy)	118.38

[a] Estimated by ProMax.

[b] Per AP-42, 5th Edition (6/08), Section 5.2, Equation 1

$$\text{Emission Factor (lb/10}^3\text{gal)} = \frac{S \times P \times M \times 12.46}{T + 460}$$

Saturation Factor = 0.6

[c] Assumes liquid can be loaded at a maximum of 8,000 gal/hour per truck. Annual rates are based on production rate.

[d] Emissions (lb/hr) = Hourly Throughput (gal/hr) / 1000 x Emission Factor (lb/10^3 gal)

[e] Loading Fugitive Emissions (lb/hr) = Uncontrolled Hourly Emissions (lb/hr) x (100% - 98.7% control efficiency)

[f] Maximum Hourly to Control (lb/hr) = Uncontrolled Hourly Emissions (lb/hr) x 98.7% control efficiency.

Speciated Loading Emissions

Loading Fugitive VOC Emissions (EPN LOAD2)

Component	**lb/hr**	**ton/year**
Promax Stream Name	**Condensate Load Comp P2**	**Condensate Load Comp P2**
H2S	5.76E-10	1.68E-09
H2O	1.40E-14	4.09E-14
TEG	6.40E-13	1.87E-12
N2	--	--
CO2	1.56E-12	4.56E-12
Methane	1.02E-14	3.00E-14
Ethane	1.05E-09	3.07E-09
Propane	3.09E-06	9.04E-06
Isobutane	2.97E-04	8.68E-04
n-Butane	0.01	0.02
Isopentane	0.16	0.47
n-Pentane	0.20	0.60
i-Hexane	0.10	0.28
Heptane	0.01	0.04
Octane	2.49E-03	0.01
Nonane	1.59E-04	4.65E-04
n-Decane	1.62E-05	4.74E-05
n-Hexane	0.03	0.08
Benzene	0.02	0.05
Toluene	3.98E-03	0.01
Ethylbenzene	1.73E-04	5.05E-04
o-Xylene	2.33E-04	6.81E-04
MDEA	3.51E-07	1.03E-06
Piperazine	5.44E-09	1.59E-08
Total	**0.53**	**1.56**
VOC	**0.53**	**1.56**
Total HAP	**0.05**	**0.14**

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
Spent Triazine Loading

EMISSION POINT: LOADTRI

Hourly	
Saturation Factor, S[b]	0.6
Number of Loading Arms	1
Produced Water Reduction (%)[g]	95%
Max True Vapor Pressure, P[a] (psia)	13.260
Molecular Weight of Vapors, M[a] (lb/lb-mol)	24.2
Max Temp of Loaded Liquid[a], T (°F)	95.00
Emission Factor[b] ($lb/10^3$ gal)	4.32
Estimated Hourly Throughput[c] (gal/hr)	8,000
Total Uncontrolled Hourly Emissions[d] (lb/hr)	1.73
Collection Efficiency (%)	0.0%
Loading Fugitive Hourly Emissions[e] (lb/hr)	1.73
Maximum Hourly Gas to Control Device[f]	--

Annual	
Saturation Factor, S[b]	0.6
Number of Loading Arms	1
Produced Water Reduction (%)[g]	95%
True Vapor Pressure, P[a] (psia)	12.419
Molecular Weight of Vapors, M[a] (lb/lb-mol)	24.2
Temp of Loaded Liquid[a], T (°F)	66.55
Emission Factor[b] ($lb/10^3$ gal)	4.27
Estimated Annual Throughput[c] (gal/yr)	3,065,998
Total Uncontrolled Annual Emissions[d] (tpy)	0.33
Collection Efficiency (%)	0.0%
Loading Fugitive Annual Emissions (tpy)	0.33
Maximum Annual Gas to Control Device[f] (tpy)	--

[a] Estimated by ProMax.

[b] Per AP-42, 5th Edition (6/08), Section 5.2, Equation 1

$$\text{Emission Factor } (lb/10^3 gal) = \frac{S \times P \times M \times 12.46}{T + 460}$$

Saturation Factor = 0.6

[c] Assumes liquid can be loaded at a maximum of 8,000 gal/hour per truck. Annual rates are based on production rate.

[d] Emissions (lb/hr) = Hourly Throughput (gal/hr) / 1000 x Emission Factor ($lb/10^3$ gal)

[e] Loading Fugitive Emissions (lb/hr) = Uncontrolled Hourly Emissions (lb/hr) x (100% - 0% control efficiency)

[f] Maximum Hourly to Control (lb/hr) = Uncontrolled Hourly Emissions (lb/hr) x 0% control efficiency.

[g] If applicable, percent Reduction for Produced Water Tank Calc. as Oil/Cond. Tank calculated using condensate properties with a produced water throughput.

Speciated Loading Emissions

Loading Fugitive VOC Emissions (EPN LOADTRI)

Component	**lb/hr**	**ton/year**
Promax Stream Name	**Triazene loading comp**	**Triazene loading comp**
H2S	4.944E-05	9.353E-06
H2O	0.34	0.06
TEG	--	--
N2	--	--
CO2	1.38	0.26
Methane	--	--
Ethane	--	--
Propane	--	--
Isobutane	--	--
n-Butane	--	--
Isopentane	--	--
n-Pentane	--	--
i-Hexane	--	--
Heptane	--	--
Octane	--	--
Nonane	--	--
n-Decane	--	--
n-Hexane	--	--
Benzene	2.89E-04	5.46E-05
Toluene	--	--
Ethylbenzene	0.006	1.06E-03
o-Xylene	1.16E-03	2.20E-04
Triazine, MEA	1.84E-14	3.49E-15
Piperazine	1.11E-10	2.11E-11
Total	**1.73**	**0.33**
VOC	**0.01**	**1.33E-03**
Total HAP	**0.01**	**1.33E-03**

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
Haul Road Emissions

EMISSION POINT: ROAD

Table 1. Summary of Maximum Hourly and Annual Fugitive Particulate Emissions from Unpaved Roads

Pollutant					
TSP		PM_{10}		$PM_{2.5}$	
lb/hr[1]	tpy[2]	lb/hr[1]	tpy[2]	lb/hr[1]	tpy[2]
1.4	5.20	0.34	1.33	0.03	0.13

Notes:

[1] Maximum hourly emissions are based on the annual emissions divided by one hour per truck trip.

[2] Maximum annual emissions are based on the maximum annual throughput and truck trips as calculated below in Table 2.

Table 2. Maximum Annual Fugitive Particulate Emissions from Unpaved Roads

Parameter	Slop Oil/Condensate/Triazine Tank Pick-Ups		
	TSP	PM_{10}	$PM_{2.5}$
Empty Truck Weight (ton)[1]	16	16	16
Load Size (ton)[2]	33	33	33
Loaded Vehicle Weight (ton)	49	49	49
Average Truck Weight (ton)	32.7	32.7	32.7
Maximum Annual Throughput (gal)[3]	61,598,168	61,598,168	61,598,168
Vehicle Miles Traveled (VMT) round trip[4]	1.04	1.04	1.04
# of Truck Trips per year[5]	7700	7700	7700
VMT/year[6]	8007.8	8007.8	8007.8
Emission factor (lb/VMT)[7]	7.6	1.9	0.2
TSP Emissions (tpy)	**5.20**	**1.33**	**0.133**

Notes:

[1] Empty vehicle weight includes driver and occupants and full fuel load.

[2] Each truck has a capacity of 8000 gallons.

Slop Oil tank contents are mostly water, therefore density is same as water: 8.34 lb/gal.

Load Size = 8000 gal truck * 8.34 lb/gal /2000 lb/ton

[3] Requested annual throughput

[4] VMT distance assumes 5491' per trip

[5] Number of truck trips per year calculated based on the requested annual throughput and the truck capacity, then rounding up to the next whole number as there cannot be a partial trip.

[6] VMT per year calculated as the product of the VMT roundtrip and number of truck trips per year.

[7] Emission factor calculated per AP-42 5th Ed., Vol.1, Section 13.2.2 (11/06), Equation 1a. PM10 and PM2.5 have a control efficiency of 57% applied per WRAP guidance for a speed limit of 15 mph. The actual site speed limit is 10 mph. An additional control efficiency of 60% was applied for watering (Department Accepted Values for: Aggregate Handling, Storage Pile, and Haul Road Emissions)

$E = k * (s/12)^a * (W/3)^b$

Where

E = size-specific emission factor (lb/VMT)

k = 4.9 (empirical constant for PM_{30}, per AP-42, Ch. 13.2.2, Table 13.2.2-2 (11/06) for Industrial Roads)

a = 0.7 (empirical constant for PM_{30}, per AP-42, Ch. 13.2.2, Table 13.2.2-2 (11/06) for Industrial Roads)

b = 0.45 (empirical constant for PM_{30}, per AP-42, Ch. 13.2.2, Table 13.2.2-2 (11/06) for Industrial Roads)

k = 1.5 (empirical constant for PM_{10}, per AP-42, Ch. 13.2.2, Table 13.2.2-2 (11/06) for Industrial Roads)

a = 0.9 (empirical constant for PM_{10}, per AP-42, Ch. 13.2.2, Table 13.2.2-2 (11/06) for Industrial Roads)

b = 0.45 (empirical constant for PM_{10}, per AP-42, Ch. 13.2.2, Table 13.2.2-2 (11/06) for Industrial Roads)

k = 0.15 (empirical constant for $PM_{2.5}$, per AP-42, Ch. 13.2.2, Table 13.2.2-2 (11/06) for Industrial Roads)

a = 0.9 (empirical constant for $PM_{2.5}$, per AP-42, Ch. 13.2.2, Table 13.2.2-2 (11/06) for Industrial Roads)

b = 0.45 (empirical constant for $PM_{2.5}$, per AP-42, Ch. 13.2.2, Table 13.2.2-2 (11/06) for Industrial Roads)

s = 4.8 (surface material silt content (%), per AP-42, Ch. 13.2.2, Table 13.2.2-1 (11/06) for sand and gravel processing on a plant road)

W = mean vehicle weight (tons)

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
VRU Downtime - Hourly

EMISSION POINT: DHY-1SSM & DHY-2SSM
SOURCE: DHY-1 & DHY-2

VRU Feed Rates and Composition[a]			VRU Control %	Still Vent Components[b]
Source	**TEG Dehydrator Still Vents (Post-Condenser)**	**Total**		
Promax Stream	To VRU			
Component	**(lb/hr)**	**(lb/hr)**	**(%)**	**(lb/hr)**
H2S	0.07	0.07	0%	**0.07**
H2O	40.02	40.02	0%	**40.02**
TEG	4.54E-09	4.54E-09	0%	**4.54E-09**
N2	6.89	6.89	0%	**6.89**
CO2	0.45	0.45	0%	**0.45**
Methane	200.87	200.87	0%	**200.87**
Ethane	13.54	13.54	0%	**13.54**
Propane	13.73	13.73	0%	**13.73**
Isobutane	2.92	2.92	0%	**2.92**
n-Butane	12.75	12.75	0%	**12.75**
Isopentane	4.55	4.55	0%	**4.55**
n-Pentane	3.91	3.91	0%	**3.91**
i-Hexane	4.22	4.22	0%	**4.22**
Heptane	0.20	0.20	0%	**0.20**
Octane	0.03	0.03	0%	**0.03**
Nonane	1.78E-03	1.78E-03	0%	**1.78E-03**
n-Decane	1.78E-04	1.78E-04	0%	**1.78E-04**
n-Hexane	0.38	0.38	0%	**0.38**
Benzene	5.94	5.94	0%	**5.94**
Toluene	1.04	1.04	0%	**1.04**
Ethylbenzene	0.03	0.03	0%	**0.03**
o-Xylene	0.05	0.05	0%	**0.05**
MDEA	3.87E-03	3.87E-03	0%	**3.87E-03**
Piperazine	1.50E-04	1.50E-04	0%	**1.50E-04**
Total	**311.61**	**311.61**	**--**	**311.61**
VOC	**49.77**	**49.77**	**--**	**49.77**
Total HAP	**7.45**	**7.45**	**--**	**7.45**

[a] Uncontrolled stream properties determined via ProMax.

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
VRU Downtime - Annual

EMISSION POINT: DHY-1SSM & DHY-2SSM
SOURCE: DHY-1 & DHY-2

VRU Downtime
2.00%

VRU Feed Rates and Composition[a]			VRU Control%	Still Vent Components[b]
Source	**TEG Dehydrator Still Vents (Post-Condenser)**	**Total**		
Promax Stream	To VRU			
Component	**175.2 hr/yr (tpy)**	**(tpy)**	**(%)**	**(tpy)**
H2S	0.01	0.01	0%	**0.01**
H2O	3.51	3.51	0%	**3.51**
TEG	0.00	3.98E-10	0%	**3.98E-10**
N2	0.60	0.60	0%	**0.60**
CO2	0.04	0.04	0%	**0.04**
Methane	17.60	17.60	0%	**17.60**
Ethane	1.19	1.19	0%	**1.19**
Propane	1.20	1.20	0%	**1.20**
Isobutane	0.26	0.26	0%	**0.26**
n-Butane	1.12	1.12	0%	**1.12**
Isopentane	0.40	0.40	0%	**0.40**
n-Pentane	0.34	0.34	0%	**0.34**
i-Hexane	0.37	0.37	0%	**0.37**
Heptane	0.02	0.02	0%	**0.02**
Octane	0.00	3.01E-03	0%	**3.01E-03**
Nonane	0.00	1.56E-04	0%	**1.56E-04**
n-Decane	0.00	1.56E-05	0%	**1.56E-05**
n-Hexane	0.03	0.03	0%	**0.03**
Benzene	0.52	0.52	0%	**0.52**
Toluene	0.09	0.09	0%	**0.09**
Ethylbenzene	0.00	3.00E-03	0%	**3.00E-03**
o-Xylene	0.00	4.08E-03	0%	**4.08E-03**
MDEA	0.00	3.39E-04	0%	**3.39E-04**
Piperazine	0.00	1.31E-05	0%	**1.31E-05**
Total	**27.30**	**27.30**	**--**	**27.30**
VOC	**4.36**	**4.36**	**--**	**4.36**
Total HAP	**0.65**	**0.65**	**--**	**0.65**

[a] Uncontrolled stream properties determined via ProMax.

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
Summary of Acid Gas Flare Emissions (AGFL-1)

Stream	NOx		CO		VOC		SO2		PM10		H2S		n-Hexane		Benzene		Toluene		O-Xylene	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Table 2-D Emissions (Pilot Only Emissions																				
Pilot Emissions	0.30	1.31	1.19	5.20	0.008	0.03	--	--	0.01	0.06	--	--	--	--	--	--	--	--	--	--
Table 2-E Emissions (Including Pilot Emissions)																				
Steady State Emissions	0.30	1.32	1.20	5.27	0.008	0.03	5.39	24.09	0.02	0.07	0.06	0.26	--	--	--	--	--	--	--	--
Table 2-F Emissions																				
SSM Emissions	100.73	7.13	401.16	28.38	9.03	0.64	3525.57	78.33	5.44	0.38	38.28	0.83	--	--	0.05	0.001	0.004	--	--	--
Maximum Emission Rate	**101.03**	**8.45**	**402.34**	**33.65**	**9.03**	**0.68**	**3525.57**	**102.42**	**5.45**	**0.46**	**38.28**	**1.09**	**--**	**--**	**0.05**	**0.001**	**0.004**	**--**	**--**	**--**

1 Maximum hourly rates include both steady state and SSM emissions since both could occur at the same time.

2 Annual SSM emissions are taken as the sum of steady state and SSM emissions.

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
Acid Gas Flare - Hourly

EMISSION POINT: AGFL-1

Stack Parameters		
Flare Height	150	ft
Flare Diameter	3.00	ft
Tip Exit Area	7.07	ft^2
Velocity	65.60	ft/s
Temp	1,832.00	°F

Flare Feed Rates and Composition[a]				FL DRE%	FL Exhaust Components[b]
Source	**Pilot and Purge Gas**	**SS Packing/Purge**	**Total**		
Promax Stream	Fuel Gas	Acid Gas to AGFL2			
Component	**(lb/hr)**	**(lb/hr)**	**(lb/hr)**	**(%)**	**(lb/hr)**
H2S	--	2.93	2.93	98%	**0.06**
H2O	--	0.69	0.69	0%	**0.69**
TEG	--	--	--	98%	**--**
N2	0.68	8.40E-05	0.68	0%	**0.68**
CO2	0.04	17.68	17.72	0%	**17.72**
Methane	19.55	0.02	19.57	98%	**0.39**
Ethane	0.69	0.01	0.70	98%	**0.01**
Propane	0.04	4.98E-03	0.04	98%	**8.64E-04**
Isobutane	2.99E-03	4.79E-04	3.47E-03	98%	**6.95E-05**
n-Butane	0.01	1.75E-03	0.01	98%	**2.43E-04**
Isopentane	0.01	5.00E-05	0.01	98%	**1.59E-04**
n-Pentane	0.01	6.13E-05	0.01	98%	**2.41E-04**
i-Hexane	0.31	7.23E-06	0.31	98%	**0.01**
Heptane	--	8.68E-08	8.68E-08	98%	**1.74E-09**
Octane	--	1.05E-08	1.05E-08	98%	**2.09E-10**
Nonane	--	--	--	98%	**--**
n-Decane	--	--	--	98%	**--**
n-Hexane	--	1.56E-06	1.56E-06	98%	**3.13E-08**
Benzene	--	3.77E-03	3.77E-03	98%	**7.54E-05**
Toluene	--	3.39E-04	3.39E-04	98%	**6.78E-06**
Ethylbenzene	--	4.32E-06	4.32E-06	98%	**8.64E-08**
o-Xylene	--	5.57E-06	5.57E-06	98%	**1.11E-07**
MDEA	--	--	--	98%	**--**
Piperazine	--	--	--	0%	**--**
Total	**21.34**	**21.34**	**42.68**	**--**	**19.56**
VOC	**0.38**	**0.01**	**0.39**	**--**	**0.01**
Total HAP	**--**	**4.12E-03**	**4.12E-03**	**--**	**8.24E-05**
			Total		
Heat Value of Stream (Btu/scf)	1,270.78	139.67	**1,151.71**		
Molecular Weight (lb/lb-mole)	16.78	40.44	**19.27**		
SO_2 emissions (lb/hr)	--	5.39	**5.39**		
Volumetric Flow (scf/hr)	**1,700.00**	200.00	**1,900.00**		
Heat Release (MMBtu/hr)	2.16	0.03	**2.19**		

Criteria Pollutant Emissions[c]		
NO_x factor:	0.1380	lb/MMBtu
CO factor:	0.5496	lb/MMBtu
PM_{10} factor:	7.60	lb/MMscf
$PM_{2.5}$ factor:	7.60	lb/MMscf
NOx	**0.30**	**lb/hr**
CO	**1.20**	**lb/hr**
PM_{10}	**0.02**	**lb/hr**
$PM_{2.5}$	**0.02**	**lb/hr**

[a] Uncontrolled stream properties determined via ProMax.

[b] FL Exhaust (lb/hr) = Total Uncontrolled Emissions (lb/hr) x (100-DRE (%)).

[c] Flare CO and NO_x emission factors from TCEQ Air Permit Technical Guidance for Chemical Sources: Flares and Vapor Oxidizers, October 2000 RG-109 (Draft), Table 4. PM and $PM_{2.5}$ emission factors from AP-42, Table 1.4-1 and 1.4-2, July 1998. SO_2 emissions assume 100% conversion of H_2S to SO_2. Since the Btu content of the makeup gas is sometimes just above 1000 Btu/scf, the most conservative emission factors were used for both NOx and CO.

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
Acid Gas Flare - Annual

EMISSION POINT: AGFL-1

Flare Feed Rates and Composition[a]				FL DRE%	FL Exhaust Components[b]	Criteria Pollutant Emissions[c]	
Source	**Pilot and Purge Gas**	**Packing**	**Total**				
Promax Stream	Fuel Gas	Acid Gas to AGFL2					
Component	**8760 hr/yr (tpy)**	**8760 hr/yr (tpy)**	**(tpy)**	**(%)**	**(tpy)**		
H2S	--	12.82	12.82	98%	**0.26**	NO_x factor:	0.1380 lb/MMBtu
H2O	--	3.04	3.04	0%	**3.04**	CO factor:	0.5496 lb/MMBtu
TEG	--	--	--	98%	**--**		
N2	2.96	3.68E-04	2.96	0%	**2.96**	PM_{10} factor:	7.60 lb/MMscf
CO2	0.16	77.44	77.60	0%	**77.60**	$PM_{2.5}$ factor:	7.60 lb/MMscf
Methane	85.63	0.08	85.71	98%	**1.71**		
Ethane	3.04	0.05	3.08	98%	**0.06**	NOx	**1.32 tpy**
Propane	0.17	0.02	0.19	98%	**3.78E-03**	CO	**5.27 tpy**
Isobutane	0.01	2.10E-03	0.02	98%	**3.04E-04**	PM_{10}	**0.07 tpy**
n-Butane	0.05	0.01	0.05	98%	**1.06E-03**	$PM_{2.5}$	**0.07 tpy**
Isopentane	0.03	2.19E-04	0.03	98%	**6.96E-04**		
n-Pentane	0.05	2.68E-04	0.05	98%	**1.06E-03**		
i-Hexane	1.36	3.17E-05	1.36	98%	**0.03**		
Heptane	--	3.80E-07	3.80E-07	98%	**7.61E-09**		
Octane	--	4.58E-08	4.58E-08	98%	**9.16E-10**		
Nonane	--	--	--	98%	**--**		
n-Decane	--	--	--	98%	**--**		
n-Hexane	--	6.85E-06	6.85E-06	98%	**1.37E-07**		
Benzene	--	0.02	0.02	98%	**3.30E-04**		
Toluene	--	1.48E-03	1.48E-03	98%	**2.97E-05**		
Ethylbenzene	--	1.89E-05	1.89E-05	98%	**3.78E-07**		
o-Xylene	--	2.44E-05	2.44E-05	98%	**4.88E-07**		
MDEA	--	--	--	98%	**--**		
Piperazine	--	--	--	0%	**--**		
Total	**93.46**	**93.46**	**186.93**	**--**	**85.66**		
VOC	**1.67**	**0.05**	**1.72**	**--**	**0.03**		
Total HAP	**--**	**0.02**	**0.02**	**--**	**3.61E-04**		
Total CO_2	**861.52**	**77.80**	**939.32**	**--**	**939.32**		
Total N_2O	**2.09E-06**	**2.70E-08**	**2.11E-06**	**--**	**2.11E-06**		
			Total				
Heat Value of Stream (Btu/scf)	1,270.78	139.67	**1,151.71**				
Molecular Weight (lb/lb-mole)	16.78	40.44	**19.27**				
SO_2 emissions (tpy)	--	24.09	**24.09**				
Volumetric Flow (scf/yr)	14,892,000.00	1,752,000.00	**16,644,000.00**				
Heat Release (MMBtu/yr)	18,924.41	244.70	**19,169.11**				

[a] Uncontrolled stream properties determined via ProMax.

[b] FL Exhaust (tpy) = Total Uncontrolled Emissions (lb/hr) x (100-DRE (%)) x Annual Hours Routed to FL (hr/yr) / 2000 (lb/ton).

[c] Flare CO and NO_x emission factors from TCEQ Air Permit Technical Guidance for Chemical Sources: Flares and Vapor Oxidizers, October 2000 RG-109 (Draft), Table 4. PM and $PM_{2.5}$ emission factors from AP-42, Table 1.4-1 and 1.4-2, July 1998. SO_2 emissions assume 100% conversion of H_2S to SO_2. Since the Btu content of the makeup gas is sometimes just above 1000 Btu/scf, the most conservative emission factors were used for both NOx

[d] GHG emissions source is 40 CFR § 98.233(n) for CH4 and CO2 mass emissions.

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
Acid Gas Flare - Hourly (SSM)

EMISSION POINT: AGFL-1 SSM

Stack Parameters		
Flare Height	150	ft
Flare Diameter	3.00	ft
Tip Exit Area	7.07	ft^2
Velocity	65.60	ft/s
Temp	1,832.00	°F

Flare Feed Rates and Composition[a]					FL DRE%	FL Exhaust Components[b]	Criteria Pollutant Emissions[c]	
Source	**Assist Gas**	**Acid Gas SSM**	**AGI Compressor Blowdown**	**Total**				
Promax Stream	Fuel Gas	Acid Gas to AGFL2	Acid Gas to AGFL2					
Component	**(lb/hr)**	**(lb/hr)**	**(lb/hr)**	**(lb/hr)**	**(%)**	**(lb/hr)**		
H2S	--	1,682.54	231.34	1,913.88	98%	**38.28**	NO_x factor:	0.1380 lb/MMBtu
H2O	--	398.61	54.81	453.42	0%	**453.42**	CO factor:	0.5496 lb/MMBtu
TEG	--	--	--	--	98%	**--**		
N2	784.82	0.05	0.01	784.88	0%	**784.88**	PM_{10} factor:	7.60 lb/MMscf
CO2	43.66	10,165.90	1,397.77	11,607.33	0%	**11,607.33**	$PM_{2.5}$ factor:	7.60 lb/MMscf
Methane	22,715.93	9.92	1.36	22,727.21	98%	**454.54**		
Ethane	805.70	6.12	0.84	812.66	98%	**16.25**	NOx	**100.73 lb/hr**
Propane	44.41	2.87	0.39	47.67	98%	**0.95**	CO	**401.16 lb/hr**
Isobutane	3.48	0.28	0.04	3.79	98%	**0.08**	PM_{10}	**5.44 lb/hr**
n-Butane	12.09	1.01	0.14	13.23	98%	**0.26**	$PM_{2.5}$	**5.44 lb/hr**
Isopentane	9.18	0.03	3.95E-03	9.21	98%	**0.18**		
n-Pentane	13.93	0.04	4.84E-03	13.97	98%	**0.28**		
i-Hexane	360.79	4.16E-03	5.72E-04	360.80	98%	**7.22**		
Heptane	--	4.99E-05	6.86E-06	5.68E-05	98%	**1.14E-06**		
Octane	--	6.01E-06	8.27E-07	6.84E-06	98%	**1.37E-07**		
Nonane	--	--	--	--	98%	**--**		
n-Decane	--	--	--	--	98%	**--**		
n-Hexane	--	8.99E-04	1.24E-04	1.02E-03	98%	**2.04E-05**		
Benzene	--	2.17	0.30	2.47	98%	**0.05**		
Toluene	--	0.19	0.03	0.22	98%	**4.43E-03**		
Ethylbenzene	--	2.48E-03	3.41E-04	2.82E-03	98%	**5.65E-05**		
o-Xylene	--	3.20E-03	4.40E-04	3.64E-03	98%	**7.29E-05**		
MDEA	--	--	--	--	98%	**--**		
Piperazine	--	--	--	--	0%	**--**		
Total	**24,793.98**	**12,269.73**	**1,687.03**	**38,750.74**	**--**	**13,363.72**		
VOC	**443.87**	**6.59**	**0.91**	**451.36**	**--**	**9.03**		
Total HAP	**--**	**2.37**	**0.33**	**2.69**	**--**	**0.05**		
				Total				
Heat Value of Stream (Btu/scf)	1,270.78	139.67	139.67	**1,056.59**				
Molecular Weight (lb/lb-mole)	16.78	40.44	40.44	**21.26**				
SO_2 emissions (lb/hr)	--	3,099.41	426.16	**3,525.57**				
Volumetric Flow (scf/hr)	560,000.00	115,000.00	15,812.00	**690,812.00**				
Heat Release (MMBtu/hr)	711.64	16.06	2.21	**729.91**				

[a] Uncontrolled stream properties determined via ProMax. The fuel gas makup volume is calculated based on the effective diameter needed to comly with the NAAQS.

[b] FL Exhaust (lb/hr) = Total Uncontrolled Emissions (lb/hr) x (100-DRE (%)).

[c] Flare CO and NO_x emission factors from TCEQ Air Permit Technical Guidance for Chemical Sources: Flares and Vapor Oxidizers, October 2000 RG-109 (Draft), Table 4. PM and $PM_{2.5}$ emission factors from AP-42, Table 1.4-1 and 1.4-2, July 1998. SO_2 emissions assume 100% conversion of H_2S to SO_2. Since the Btu content of the makeup gas is sometimes just above 1000 Btu/scf, the most conservative emission factors were used for both NOx and CO.

[d] GHG emissions source is 40 CFR § 98.233(n) for CH4 and CO2 mass emissions.

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
Acid Gas Flare - Annual (SSM)

EMISSION POINT: AGFL-1 SSM

Flare Feed Rates and Composition[a]					FL DRE%	FL Exhaust Components[b]	Criteria Pollutant Emissions[c]	
Source	**Assist Gas**	**Acid Gas SSM**	**AGI Compressor Blowdown**	**Total**				
Promax Stream	Fuel Gas	Acid Gas to AGFL2	Acid Gas to AGFL2					
Component	**144 hr/yr**	**40 hr/yr**	**208 blowdowns/yr**	**(tpy)**	**(%)**	**(tpy)**		
	(tpy)	**(tpy)**	**(tpy)**					
H2S	--	33.65	8.02	41.67	98%	**0.83**	NO_x factor:	0.1380 lb/MMBtu
H2O	--	7.97	1.90	9.87	0%	**9.87**	CO factor:	0.5496 lb/MMBtu
TEG	--	--	--	--	98%	**--**		
N2	56.51	9.66E-04	2.30E-04	56.51	0%	**56.51**	PM_{10} factor:	7.60 lb/MMscf
CO2	3.14	203.32	48.46	254.92	0%	**254.92**	$PM_{2.5}$ factor:	7.60 lb/MMscf
Methane	1,635.55	0.20	0.05	1,635.79	98%	**32.72**		
Ethane	58.01	0.12	0.03	58.16	98%	**1.16**	NOx	**7.13 tpy**
Propane	3.20	0.06	0.01	3.27	98%	**0.07**	CO	**28.38 tpy**
Isobutane	0.25	0.01	1.31E-03	0.26	98%	**0.01**	PM_{10}	**0.38 tpy**
n-Butane	0.87	0.02	4.80E-03	0.90	98%	**0.02**	$PM_{2.5}$	**0.38 tpy**
Isopentane	0.66	5.75E-04	1.37E-04	0.66	98%	**0.01**		
n-Pentane	1.00	7.05E-04	1.68E-04	1.00	98%	**0.02**		
i-Hexane	25.98	8.32E-05	1.98E-05	25.98	98%	**0.52**		
Heptane	--	9.98E-07	2.38E-07	1.24E-06	98%	**2.47E-08**		
Octane	--	1.20E-07	2.87E-08	1.49E-07	98%	**2.98E-09**		
Nonane	--	--	--	--	98%	**--**		
n-Decane	--	--	--	--	98%	**--**		
n-Hexane	--	1.80E-05	4.28E-06	2.23E-05	98%	**4.45E-07**		
Benzene	--	0.04	0.01	0.05	98%	**1.07E-03**		
Toluene	--	3.90E-03	9.29E-04	4.83E-03	98%	**9.66E-05**		
Ethylbenzene	--	4.97E-05	1.18E-05	6.15E-05	98%	**1.23E-06**		
o-Xylene	--	6.41E-05	1.53E-05	7.93E-05	98%	**1.59E-06**		
MDEA	--	--	--	--	98%	**--**		
Piperazine	--	--	--	--	0%	**--**		
Total	**1,785.17**	**245.39**	**58.48**	**2,089.04**	**--**	**356.65**		
VOC	**31.96**	**0.13**	**0.03**	**32.12**	**--**	**0.64**		
Total HAP	**--**	**0.05**	**0.01**	**0.06**	**--**	**1.17E-03**		
Total CO_2	**4,736.40**	**204.27**	**48.68**	**4,989.35**	**--**	**4,989.35**		
Total N_2O	**1.13E-05**	**7.08E-08**	**1.69E-08**	**1.14E-05**	**--**	**1.14E-05**		
				Total				
Heat Value of Stream (Btu/scf)	1,270.78	139.67	139.67	**1,196.15**				
Molecular Weight (lb/lb-mole)	16.78	40.44	40.44	**18.34**				
SO_2 emissions (tpy)	--	63.25	15.07	**78.33**				
Volumetric Flow (scf/yr)	80,640,000.00	4,600,000.00	1,096,298.67	**86,336,298.67**				
Heat Release (MMBtu/yr)	102,475.44	642.48	153.12	**103,271.04**				

[a] Uncontrolled stream properties determined via ProMax. Since the stream is close to 1,000 Btu, the more conservative CO factor is used.

[b] FL Exhaust (tpy) = Total Uncontrolled Emissions (lb/hr) x (100-DRE (%)) x Annual Hours Routed to FL (hr/yr) / 2000 (lb/ton).

[c] Flare CO and NO_x emission factors from TCEQ Air Permit Technical Guidance for Chemical Sources: Flares and Vapor Oxidizers, October 2000 RG-109 (Draft), Table 4. PM and $PM_{2.5}$ emission factors from AP-42, Table 1.4-1 and 1.4-2, July 1998. SO_2 emissions assume 100% conversion of H_2S to SO_2. Since the Btu content of the makeup gas is sometimes just above 1000 Btu/scf, the most conservative emission factors were used for both NOx and CO.

[d] GHG emissions source is 40 CFR § 98.233(n) for CH4 and CO2 mass emissions.

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
Summary of Flare Emissions (FL-1)

Stream	NOx		CO		VOC		SO2		PM10		H2S		n-Hexane		Benzene		Toluene		O-Xylene	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Table 2-D Emissions (Pilot Only Emissions																				
Pilot Emissions	1.30	5.68	2.59	11.35	0.05	0.22	--	--	0.06	0.25	--	--	--	--	--	--	--	--	--	--
Table 2-E Emissions (Including Pilot Emissions)																				
Steady State Emissions	1.74	7.63	3.48	15.23	0.87	3.82	6.76	29.61	0.09	0.41	0.07	0.32	0.02	0.07	0.01	0.05	0.009	0.04	0.002	0.01
Table 2-F Emissions																				
SSM Emissions	93.73	6.89	187.13	13.76	173.52	12.99	1426.60	82.78	5.06	0.37	15.18	0.88	3.39	0.18	2.40	0.13	1.90	0.10	0.45	0.02
Maximum Emission Rate	**95.48**	**14.52**	**190.61**	**28.99**	**174.39**	**16.81**	**1433.36**	**112.39**	**5.15**	**0.78**	**15.25**	**1.20**	**3.41**	**0.25**	**2.41**	**0.18**	**1.91**	**0.14**	**0.45**	**0.03**

1 Maximum hourly rates include both steady state and SSM emissions since both could occur at the same time.

2 Annual SSM emissions are taken as the sum of steady state and SSM emissions.

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
Process Gas Flare - Hourly

EMISSION POINT: FL-1

Stack Parameters		
Flare Height	150	ft
Flare Diameter	3.00	ft
Tip Exit Area	7.07	ft^2
Velocity	65.60	ft/s
Temp	1,832.00	°F

Flare Feed Rates and Composition[a]				FL DRE%	FL Exhaust Components[b]
Source	**Pilot and Purge Gas**	**Process Flare Gas**	**Total**		
Promax Stream	Fuel Gas	Site Inlet P2			
Component	**(lb/hr)**	**(lb/hr)**	**(lb/hr)**	**(%)**	**(lb/hr)**
H2S	--	3.60	3.60	98%	**0.07**
H2O	--	--	--	0%	**--**
TEG	--	--	--	98%	**--**
N2	4.42	2.47	6.89	0%	**6.89**
CO2	0.25	20.90	21.15	0%	**21.15**
Methane	127.97	50.99	178.96	98%	**3.58**
Ethane	4.54	20.60	25.14	98%	**0.50**
Propane	0.25	17.95	18.20	98%	**0.36**
Isobutane	0.02	3.12	3.14	98%	**0.06**
n-Butane	0.07	8.03	8.10	98%	**0.16**
Isopentane	0.05	2.80	2.85	98%	**0.06**
n-Pentane	0.08	2.70	2.78	98%	**0.06**
i-Hexane	2.03	2.03	4.06	98%	**0.08**
Heptane	--	1.34	1.34	98%	**0.03**
Octane	--	0.91	0.91	98%	**0.02**
Nonane	--	0.19	0.19	98%	**3.80E-03**
n-Decane	--	0.06	0.06	98%	**1.23E-03**
n-Hexane	--	0.80	0.80	98%	**0.02**
Benzene	--	0.57	0.57	98%	**0.01**
Toluene	--	0.45	0.45	98%	**0.01**
Ethylbenzene	--	0.07	0.07	98%	**1.32E-03**
o-Xylene	--	0.11	0.11	98%	**2.13E-03**
MDEA	--	--	--	98%	**--**
Piperazine	--	--	--	0%	**--**
Total	**139.67**	**139.67**	**279.35**	**--**	**33.06**
VOC	**2.50**	**41.12**	**43.62**	**--**	**0.87**
Total HAP	**--**	**1.99**	**1.99**	**--**	**0.04**
			Total		
Heat Value of Stream (Btu/scf)	1,270.78	1,609.55	**1,342.86**		
Molecular Weight (lb/lb-mole)	16.78	26.47	**18.84**		
SO_2 emissions (lb/hr)	--	6.76	**6.76**		
Volumetric Flow (scf/hr)	**7,400.00**	2,000.00	**9,400.00**		
Heat Release (MMBtu/hr)	9.40	3.22	**12.62**		

Criteria Pollutant Emissions[c]	
NO_x factor:	0.1380 lb/MMBtu
CO factor:	0.2755 lb/MMBtu
PM_{10} factor:	7.60 lb/MMscf
$PM_{2.5}$ factor:	7.60 lb/MMscf
NOx	**1.74 lb/hr**
CO	**3.48 lb/hr**
PM_{10}	**0.09 lb/hr**
$PM_{2.5}$	**0.09 lb/hr**

[a] Uncontrolled stream properties determined via ProMax.

[b] FL Exhaust (lb/hr) = Total Uncontrolled Emissions (lb/hr) x (100-DRE (%)).

[c] Flare CO and NO_x emission factors from TCEQ Air Permit Technical Guidance for Chemical Sources: Flares and Vapor Oxidizers, October 2000 RG-109 (Draft), Table 4. PM and $PM_{2.5}$ emission factors from AP-42, Table 1.4-1 and 1.4-2, July 1998. SO_2 emissions assume 100% conversion of H_2S to SO_2.

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
Process Gas Flare - Annual

EMISSION POINT: FL-1

Flare Feed Rates and Composition[a]				FL DRE%	FL Exhaust Components[b]	Criteria Pollutant Emissions[c]	
Source	**Pilot and Purge Gas**	**Process Flare Gas**	**Total**				
Promax Stream	Fuel Gas	Site Inlet P2					
Component	**8760 hr/yr (tpy)**	**8760 hr/yr (tpy)**	**(tpy)**	**(%)**	**(tpy)**		
H2S	--	15.75	15.75	98%	**0.32**	NO_x factor:	0.1380 lb/MMBtu
H2O	--	0.00	--	0%	**--**	CO factor:	0.2755 lb/MMBtu
TEG	--	0.00	--	98%	**--**		
N2	19.36	10.82	30.19	0%	**30.19**	PM_{10} factor:	7.60 lb/MMscf
CO2	1.08	91.54	92.62	0%	**92.62**	$PM_{2.5}$ factor:	7.60 lb/MMscf
Methane	560.50	223.33	783.83	98%	**15.68**		
Ethane	19.88	90.23	110.11	98%	**2.20**	NOx	**7.63 tpy**
Propane	1.10	78.64	79.73	98%	**1.59**	CO	**15.23 tpy**
Isobutane	0.09	13.66	13.74	98%	**0.27**	PM_{10}	**0.41 tpy**
n-Butane	0.30	35.18	35.48	98%	**0.71**	$PM_{2.5}$	**0.41 tpy**
Isopentane	0.23	12.25	12.48	98%	**0.25**		
n-Pentane	0.34	11.81	12.16	98%	**0.24**		
i-Hexane	8.90	8.87	17.77	98%	**0.36**		
Heptane	--	5.88	5.88	98%	**0.12**		
Octane	--	3.97	3.97	98%	**0.08**		
Nonane	--	0.83	0.83	98%	**0.02**		
n-Decane	--	0.27	0.27	98%	**0.01**		
n-Hexane	--	3.52	3.52	98%	**0.07**		
Benzene	--	2.49	2.49	98%	**0.05**		
Toluene	--	1.97	1.97	98%	**0.04**		
Ethylbenzene	--	0.29	0.29	98%	**0.01**		
o-Xylene	--	0.47	0.47	98%	**0.01**		
MDEA	--	0.00	--	98%	**--**		
Piperazine	--	0.00	--	0%	**--**		
Total	**611.78**	**611.78**	**1,223.55**	**--**	**144.82**		
VOC	**10.95**	**180.10**	**191.05**	**--**	**3.82**		
Total HAP	**--**	**8.74**	**8.74**	**--**	**0.17**		
Total CO_2	**3,750.13**	**1,489.98**	**5,240.11**	**--**	**5,240.11**		
Total N_2O	**9.08E-06**	**3.11E-06**	**1.22E-05**	**--**	**1.22E-05**		
			Total				
Heat Value of Stream (Btu/scf)	1,270.78	1,609.55	**1,342.86**				
Molecular Weight (lb/lb-mole)	16.78	26.47	**18.84**				
SO_2 emissions (tpy)	--	29.61	**29.61**				
Volumetric Flow (scf/yr)	64,824,000.00	17,520,000.00	**82,344,000.00**				
Heat Release (MMBtu/yr)	82,376.83	28,199.38	**110,576.21**				

[a] Uncontrolled stream properties determined via ProMax.

[b] FL Exhaust (tpy) = Total Uncontrolled Emissions (lb/hr) x (100-DRE (%)) x Annual Hours Routed to FL (hr/yr) / 2000 (lb/ton).

[c] Flare CO and NO_x emission factors from TCEQ Air Permit Technical Guidance for Chemical Sources: Flares and Vapor Oxidizers, October 2000 RG-109 (Draft), Table 4. PM and PM_{25} emission factors from AP-42, Table 1.4-1 and 1.4-2, July 1998. SO_2 emissions assume 100% conversion of H_2S to SO_2.

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
Process Gas Flare - Hourly (SSM)

EMISSION POINT: FL-1 SSM

Stack Parameters		
Flare Height	150	ft
Flare Diameter	3.00	ft
Tip Exit Area	7.07	ft^2
Velocity	65.60	ft/s
Temp	1,832	°F

Flare Feed Rates and Composition[a]			FL DRE%	FL Exhaust Components[b]
Source	**SSM Flare Gas**	**Total**		
Promax Stream	Site Inlet P2			
Component	**(lb/hr)**	**(lb/hr)**	**(%)**	**(lb/hr)**
H2S	758.95	758.95	98%	**15.18**
H2O	--	--	0%	**--**
TEG	--	--	98%	**--**
N2	521.31	521.31	0%	**521.31**
CO2	4,409.99	4,409.99	0%	**4,409.99**
Methane	10,758.42	10,758.42	98%	**215.17**
Ethane	4,346.61	4,346.61	98%	**86.93**
Propane	3,788.20	3,788.20	98%	**75.76**
Isobutane	657.91	657.91	98%	**13.16**
n-Butane	1,694.93	1,694.93	98%	**33.90**
Isopentane	590.14	590.14	98%	**11.80**
n-Pentane	569.01	569.01	98%	**11.38**
i-Hexane	427.28	427.28	98%	**8.55**
Heptane	283.28	283.28	98%	**5.67**
Octane	191.42	191.42	98%	**3.83**
Nonane	40.13	40.13	98%	**0.80**
n-Decane	12.99	12.99	98%	**0.26**
n-Hexane	169.64	169.64	98%	**3.39**
Benzene	119.85	119.85	98%	**2.40**
Toluene	94.90	94.90	98%	**1.90**
Ethylbenzene	13.95	13.95	98%	**0.28**
o-Xylene	22.46	22.46	98%	**0.45**
MDEA	--	--	98%	**--**
Piperazine	--	--	0%	**--**
Total	**29,471.36**	**29,471.36**	**--**	**5,422.10**
VOC	**8,676.07**	**8,676.07**	**--**	**173.52**
Total HAP	**420.80**	**420.80**	**--**	**8.42**
		Total		
Heat Value of Stream (Btu/scf)	1,609.55	**1,609.55**		
Molecular Weight (lb/lb-mole)	26.47	**26.47**		
SO_2 emissions (lb/hr)	1,426.60	**1,426.60**		
Volumetric Flow (scf/hr)	422,000.00	**422,000.00**		
Heat Release (MMBtu/hr)	679.23	**679.23**		

Criteria Pollutant Emissions[c]		
NO_x factor:	0.1380	lb/MMBtu
CO factor:	0.2755	lb/MMBtu
PM_{10} factor:	7.60	lb/MMscf
$PM_{2.5}$ factor:	7.60	lb/MMscf
NOx	**93.73**	**lb/hr**
CO	**187.13**	**lb/hr**
PM_{10}	**5.06**	**lb/hr**
$PM_{2.5}$	**5.06**	**lb/hr**

[a] Uncontrolled stream properties determined via ProMax. The max hourly flow is based on a blowdown of the inlet slug catcher within 1 hour.

[b] FL Exhaust (lb/hr) = Total Uncontrolled Emissions (lb/hr) x (100-DRE (%)).

[c] Flare CO and NO_x emission factors from TCEQ Air Permit Technical Guidance for Chemical Sources: Flares and Vapor Oxidizers, October 2000 RG-109 (Draft), Table 4. PM and $PM_{2.5}$ emission factors from AP-42, Table 1.4-1 and 1.4-2, July 1998. SO_2 emissions assume 100% conversion of H_2S to SO_2.

[d] GHG emissions source is 40 CFR § 98.233(n) for CH4 and CO2 mass emissions.

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
Process Gas Flare - Annual (SSM)

EMISSION POINT: FL-1 SSM

Flare Feed Rates and Composition[a]			FL DRE%	FL Exhaust Components[b]	Criteria Pollutant Emissions[c]	
Source	**SSM Flare Gas**	**Total**				
Promax Stream	N/A					
Component	**(tpy)**	**(tpy)**	**(%)**	**(tpy)**		
H2S	44.04	44.04	98%	**0.88**	NO_x factor:	0.1380 lb/MMBtu
H2O	1.42	1.42	0%	**1.42**	CO factor:	0.2755 lb/MMBtu
TEG	0.01	0.01	98%	**1.18E-04**		
N2	34.78	34.78	0%	**34.78**	PM_{10} factor:	7.60 lb/MMscf
CO2	246.84	246.84	0%	**246.84**	$PM_{2.5}$ factor:	7.60 lb/MMscf
Methane	761.55	761.55	98%	**15.23**		
Ethane	342.17	342.17	98%	**6.84**	NOx	**6.89 tpy**
Propane	309.08	309.08	98%	**6.18**	CO	**13.76 tpy**
Isobutane	52.06	52.06	98%	**1.04**	PM_{10}	**0.37 tpy**
n-Butane	136.20	136.20	98%	**2.72**	$PM_{2.5}$	**0.37 tpy**
Isopentane	41.41	41.41	98%	**0.83**		
n-Pentane	36.61	36.61	98%	**0.73**		
i-Hexane	23.69	23.69	98%	**0.47**		
Heptane	14.85	14.85	98%	**0.30**		
Octane	9.96	9.96	98%	**0.20**		
Nonane	2.08	2.08	98%	**0.04**		
n-Decane	0.67	0.67	98%	**0.01**		
n-Hexane	9.18	9.18	98%	**0.18**		
Benzene	6.61	6.61	98%	**0.13**		
Toluene	4.98	4.98	98%	**0.10**		
Ethylbenzene	0.73	0.73	98%	**0.01**		
o-Xylene	1.17	1.17	98%	**0.02**		
MDEA	0.00	5.87E-04	98%	**1.17E-05**		
Piperazine	0.00	2.59E-03	0%	**2.59E-03**		
Total	**2,080.08**	**2,080.08**	**--**	**318.98**		
VOC	**649.28**	**649.28**	**--**	**12.99**		
Total HAP	**22.66**	**22.66**	**--**	**0.45**		
Total CO_2	**5,237.39**	**5,237.39**	**--**	**5,237.39**		
Total N_2O	**1.10E-05**	**1.10E-05**	**--**	**1.10E-05**		

		Total
Heat Value of Stream (Btu/scf)	1,584.51	**1,584.51**
Molecular Weight (lb/lb-mole)	25.01	**25.01**
SO_2 emissions (tpy)	82.78	**82.78**
Volumetric Flow (scf/yr)	63,031,665	**63,031,665**
Heat Release (MMBtu/yr)	99,874.58	**99,874.58**

[a] Uncontrolled stream properties determined via ProMax. The flared gas stream is a mixture of numerous SSM streams potentially being flared.

[b] FL Exhaust (tpy) = Total Uncontrolled Emissions (lb/hr) x (100-DRE (%)) x Annual Hours Routed to FL (hr/yr) / 2000 (lb/ton).

[c] Flare CO and NO_x emission factors from TCEQ Air Permit Technical Guidance for Chemical Sources: Flares and Vapor Oxidizers, October 2000 RG-109 (Draft), Table 4. PM and $PM_{2.5}$ emission factors from AP-42, Table 1.4-1 and 1.4-2, July 1998. SO_2 emissions assume 100% conversion of H_2S to SO_2.

[d] GHG emissions source is 40 CFR § 98.233(n) for CH4 and CO2 mass emissions.

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
SSM - Sweet Gas Compressor Blowdowns

EMISSION POINT: SSMBD COMP

EPN	SSM-BD1
FIN	SSM-BD1
Identifier	Sweet Gas Compressor Blowdowns

Describe this MSS event in detail, include specifically what is being done and how it is being done.	Compressors are blown down for maintenance and other purposes. A total of 20 compressor blowdowns per year per compressor. Volumes are calculated using inlet and discharge pressures/temperatures from each stage of compression.

Venting Emission Calculation

Ideal Gas Constant, [(ft3*psia)/(R*lb-mol)

10.73159

Volume of the Vented Unit (scf - standard cubic feet)	15000.0
Duration of Each Event (hours/event)	1
Frequency of Events (events/year)	100
Venting Gas Molecular Weight (lb/lb-mol)	22.31
VOC wt %	26.30
benzene wt%	0.03
HAP wt%	0.06
H_2S wt%	1.74E-04
Are planned MSS vapors (A) uncontrolled; (B) controlled by a flare, vapor combustor, thermal oxidizer, or vapor recovery unit (VRU); or (C) controlled by another type of control device?	(A) uncontrolled

Planned MSS Emissions

Results:	Hourly Emissions (lb/hr)	Annual Emissions (tpy)
VOC	232.07	11.60
Benzene	0.23	0.01
Total HAP	0.57	0.03
H_2S	1.54E-03	7.69E-05
CO_2	0.02	7.81E-04
Methane	453.38	22.67
Ethane	174.81	8.74
Propane	138.88	6.94
Isobutane	21.20	1.06
n-Butane	51.70	2.59
Isopentane	11.25	0.56
n-Pentane	6.98	0.35
i-Hexane	1.39	0.07
Heptane	0.09	4.38E-03
Octane	0.01	3.96E-04
Nonane	1.73E-04	8.64E-06
n-Decane	1.04E-05	5.18E-07
n-Hexane	0.31	0.02
Toluene	0.03	1.30E-03
Ethylbenzene	6.06E-04	3.03E-05
o-Xylene	6.10E-04	3.05E-05
MDEA	3.99E-06	1.99E-07
Piperazine	2.35E-03	1.17E-04

Gas Molecular Weight and Weight Percents From Analyses Tab:

Molecular Weight	22.31
VOC wt %	26.30
Benzene wt %	0.03
HAP wt %	0.06
H2S wt %	1.74E-04
CO2 wt %	1.77E-03
CH4 wt %	51.38
Ethane wt %	19.81
Propane wt %	15.74
Isobutane wt %	2.40
n-Butane wt %	5.86
Isopentane wt %	1.27
n-Pentane wt %	0.79
i-Hexane wt %	0.16
Heptane wt %	0.01
Octane wt %	8.97E-04
Nonane wt %	1.96E-05
n-Decane wt %	1.17E-06
n-Hexane wt %	0.04
Toluene wt %	2.95E-03
Ethylbenzene wt %	6.87E-05
o-Xylene wt %	6.91E-05
MDEA wt %	4.52E-07
Piperazine wt %	2.66E-04

VOC Type: (pick from list)
Natural Gas VOC

Emission Type: (pick from list)
Low Pressure Periodic

Enter any notes here:	Physical properties of the vapor are based on the properties of the inlet to the sweet gas compression stream.

Calculations / Equations used

$$\text{VOC result (lb/hr)} = \frac{\text{(Standard Volume of Gas Vented per Event)} * \text{(Molecular Weight)} * \text{VOC wt\%}}{\text{(379.3 scf/lb-mol)} * \text{(Duration of Event}}$$

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
SSM - Dehydrator Contactor Blowdowns

EMISSION POINT: SSMBD DEHY

EPN	SSM-BD DEHY
FIN	SSM-BD DEHY
Identifier	Dehydrator Contactor Blowdowns

Describe this MSS event in detail, include specifically what is being done and how it is being done.	Dehydrator contactors are blown down for maintenance and other purposes. A total of 12 blowdowns per year per contactor. Volumes are calculated using inlet and discharge pressures/temperatures.

Venting Emission Calculation

Ideal Gas Constant, [(ft3*psia)/(R*lb-mol)

10.73159

Volume of the Vented Unit (scf - standard cubic feet)	17600.0
Duration of Each Event (hours/event)	1
Frequency of Events (events/year)	24
Venting Gas Molecular Weight (lb/lb-mol)	22.31
VOC wt %	26.28
benzene wt%	0.03
HAP wt%	0.07
H_2S wt%	1.76E-04
Are planned MSS vapors (A) uncontrolled; (B) controlled by a flare, vapor combustor, thermal oxidizer, or vapor recovery unit (VRU); or (C) controlled by another type of control device?	(A) uncontrolled

Planned MSS Emissions

	Hourly Emissions (lb/hr)	Annual Emissions (tpy)
VOC	272.07	3.26
Benzene	0.30	3.54E-03
Total HAP	0.70	0.01
H_2S	1.82E-03	2.19E-05
CO_2	0.02	2.20E-04
Methane	530.86	6.37
Ethane	204.78	2.46
Propane	162.76	1.95
Isobutane	24.85	0.30
n-Butane	60.63	0.73
Isopentane	13.19	0.16
n-Pentane	8.19	0.10
i-Hexane	1.63	0.02
Heptane	0.10	1.24E-03
Octane	0.01	1.12E-04
Nonane	2.04E-04	2.45E-06
n-Decane	1.23E-05	1.47E-07
n-Hexane	0.37	4.44E-03
Toluene	0.03	4.18E-04
Ethylbenzene	8.49E-04	1.02E-05
o-Xylene	9.03E-04	1.08E-05
MDEA	2.18E-04	2.61E-06
Piperazine	4.90E-03	5.88E-05

Gas Molecular Weight and Weight Percents From Analyses Tab:

Molecular Weight	22.31
VOC wt %	26.28
Benzene wt %	0.03
HAP wt %	0.07
H2S wt %	1.76E-04
CO2 wt %	1.77E-03
CH4 wt %	51.28
Ethane wt %	19.78
Propane wt %	15.72
Isobutane wt %	2.40
n-Butane wt %	5.86
Isopentane wt %	1.27
n-Pentane wt %	0.79
i-Hexane wt %	0.16
Heptane wt %	0.01
Octane wt %	9.02E-04
Nonane wt %	1.97E-05
n-Decane wt %	1.19E-06
n-Hexane wt %	0.04
Toluene wt %	3.37E-03
Ethylbenzene wt %	8.20E-05
o-Xylene wt %	8.72E-05
MDEA wt %	2.10E-05
Piperazine wt %	4.73E-04

VOC Type: (pick from list)
Natural Gas VOC

Emission Type: (pick from list)
Low Pressure Periodic

Enter any notes here:	Physical properties of the vapor are based on the properties of the glycol contactor inlet stream.

Calculations / Equations used

$$\text{VOC result (lb/hr)} = \frac{\text{(Standard Volume of Gas Vented per Event)} * \text{(Molecular Weight)} * \text{VOC wt\%}}{\text{(379.3 scf/lb-mol)} * \text{(Duration of Event}}$$

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
SSM - Sweet Gas Filter Blowdowns

EMISSION POINT: SSMBD FILTERS

EPN	SSM-BD Filters
FIN	SSM-BD Filters
Identifier	Coalescer Filter Blowdowns

Describe this MSS event in detail, include specifically what is being done and how it is being done.	Emissions from coalescer filter blowdowns. Assuming monthly blowdowns of 5 filters.

Venting Emission Calculation

Ideal Gas Constant, [(ft3*psia)/(R*lb-mol)

10.73159

Volume of the Vented Unit (scf - standard cubic feet)	3000.0
Duration of Each Event (hours/event)	1
Frequency of Events (events/year)	60
Venting Gas Molecular Weight (lb/lb-mol)	22.31
VOC wt %	26.30
benzene wt%	0.03
HAP wt%	0.06
H_2S wt%	1.74E-04
Are planned MSS vapors (A) uncontrolled; (B) controlled by a flare, vapor combustor, thermal oxidizer, or vapor recovery unit (VRU); or (C) controlled by another type of control device?	(A) uncontrolled

Planned MSS Emissions

	Hourly Emissions (lb/hr)	Annual Emissions (tpy)
VOC	46.41	1.39
Benzene	0.05	1.38E-03
Total HAP	0.11	3.43E-03
H_2S	3.07E-04	9.22E-06
CO_2	3.12E-03	9.37E-05
Methane	90.68	2.72
Ethane	34.96	1.05
Propane	27.78	0.83
Isobutane	4.24	0.13
n-Butane	10.34	0.31
Isopentane	2.25	0.07
n-Pentane	1.40	0.04
i-Hexane	0.28	0.01
Heptane	0.02	5.26E-04
Octane	1.58E-03	4.75E-05
Nonane	3.46E-05	1.04E-06
n-Decane	2.07E-06	6.22E-08
n-Hexane	0.06	1.89E-03
Toluene	0.01	1.56E-04
Ethylbenzene	1.21E-04	3.64E-06
o-Xylene	1.22E-04	3.66E-06
MDEA	7.97E-07	2.39E-08
Piperazine	4.70E-04	1.41E-05

Gas Molecular Weight and Weight Percents From Analyses Tab:

Molecular Weight	22.31
VOC wt %	26.30
Benzene wt %	0.03
HAP wt %	0.06
H2S wt %	1.74E-04
CO2 wt %	1.77E-03
CH4 wt %	51.38
Ethane wt %	19.81
Propane wt %	15.74
Isobutane wt %	2.40
n-Butane wt %	5.86
Isopentane wt %	1.27
n-Pentane wt %	0.79
i-Hexane wt %	0.16
Heptane wt %	0.01
Octane wt %	8.97E-04
Nonane wt %	1.96E-05
n-Decane wt %	1.17E-06
n-Hexane wt %	0.04
Toluene wt %	2.95E-03
Ethylbenzene wt %	6.87E-05
o-Xylene wt %	6.91E-05
MDEA wt %	4.52E-07
Piperazine wt %	2.66E-04

VOC Type: (pick from list)
Natural Gas VOC

Emission Type: (pick from list)
Low Pressure Periodic

Enter any notes here:	Physical properties of the vapor are based on the properties of the sweet gas stream.

Calculations / Equations used

$$\text{VOC result (lb/hr)} = \frac{\text{(Standard Volume of Gas Vented per Event)} * \text{(Molecular Weight)} * \text{VOC wt\%}}{\text{(379.3 scf/lb-mol)} * \text{(Duration of Event}}$$

Northwind Midstream Partners, LLC
Titan Treater Plant Plant #2
SSM - Sweet Gas Piping Blowdowns

EMISSION POINT: SSMBD PIPE

EPN	SSM-BD PIPE
FIN	SSM-BD PIPE
Identifier	Sweet Gas Piping Blowdowns

Describe this MSS event in detail, include specifically what is being done and how it is being done.	Sweet gas pipes are blown down for maintenance and other purposes. A total of 12 blowdowns per year. Volumes are calculated using conservative pressures/temperatures and acft of piping.

Venting Emission Calculation

Ideal Gas Constant, [(ft3*psia)/(R*lb-mol)

10.73159

Volume of the Vented Unit (scf - standard cubic feet)	75000.0
Duration of Each Event (hours/event)	1
Frequency of Events (events/year)	12
Venting Gas Molecular Weight (lb/lb-mol)	22.31
VOC wt %	26.30
benzene wt%	0.03
HAP wt%	0.06
H_2S wt%	1.74E-04
Are planned MSS vapors (A) uncontrolled; (B) controlled by a flare, vapor combustor, thermal oxidizer, or vapor recovery unit (VRU); or (C) controlled by another type of control device?	(A) uncontrolled

Planned MSS Emissions

	Hourly Emissions (lb/hr)	Annual Emissions (tpy)
VOC	1,160.36	6.96
Benzene	1.15	0.01
Total HAP	2.86	0.02
H_2S	0.008	4.61E-05
CO_2	0.08	4.69E-04
Methane	2,266.88	13.60
Ethane	874.03	5.24
Propane	694.38	4.17
Isobutane	106.01	0.64
n-Butane	258.51	1.55
Isopentane	56.23	0.34
n-Pentane	34.90	0.21
i-Hexane	6.93	0.04
Heptane	0.44	2.63E-03
Octane	0.04	2.38E-04
Nonane	8.64E-04	5.18E-06
n-Decane	5.18E-05	3.11E-07
n-Hexane	1.57	0.01
Toluene	0.13	7.82E-04
Ethylbenzene	3.03E-03	1.82E-05
o-Xylene	3.05E-03	1.83E-05
MDEA	1.99E-05	1.20E-07
Piperazine	0.01	7.05E-05

Gas Molecular Weight and Weight Percents From Analyses Tab:

Molecular Weight	22.31
VOC wt %	26.30
Benzene wt %	0.03
HAP wt %	0.06
H2S wt %	1.74E-04
CO2 wt %	1.77E-03
CH4 wt %	51.38
Ethane wt %	19.81
Propane wt %	15.74
Isobutane wt %	2.40
n-Butane wt %	5.86
Isopentane wt %	1.27
n-Pentane wt %	0.79
i-Hexane wt %	0.16
Heptane wt %	0.01
Octane wt %	8.97E-04
Nonane wt %	1.96E-05
n-Decane wt %	1.17E-06
n-Hexane wt %	0.04
Toluene wt %	2.95E-03
Ethylbenzene wt %	6.87E-05
o-Xylene wt %	6.91E-05
MDEA wt %	4.52E-07
Piperazine wt %	2.66E-04

VOC Type: (pick from list)
Natural Gas VOC

Emission Type: (pick from list)
Low Pressure Periodic

Enter any notes here:	Physical properties of the vapor are based on the properties of the sweet gas stream.

Calculations / Equations used

$$\text{VOC result (lb/hr)} = \frac{\text{(Standard Volume of Gas Vented per Event)} * \text{(Molecular Weight)} * \text{VOC wt\%}}{\text{(379.3 scf/lb-mol)} * \text{(Duration of Event}}$$

Section 7

Information Used to Determine Emissions

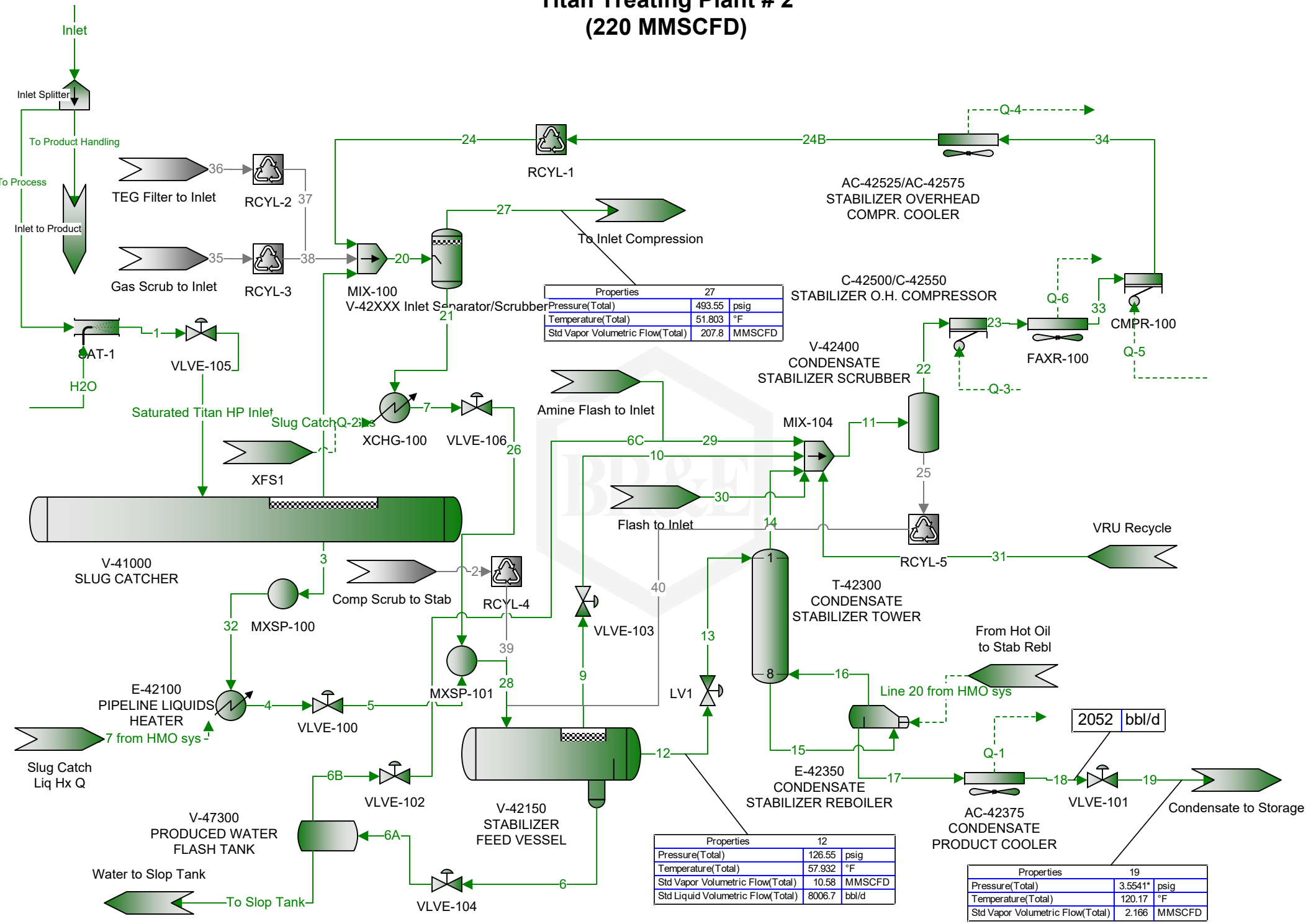
Information Used to Determine Emissions shall include the following:

- ☒ 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.

- BR&E ProMax Report
- Representative Inlet Gas Analysis – Upstream well stream gas composition that flows into site
- Heater manufacturer specification sheets
- Flare manufacturer specification sheets
- Current version of AP-42 located online at: EPA AP-42 Compilation Air Emissions Factors
- TNRCC RG-109 Emission Factors
- 40 CFR 98 Subpart C Tables C-1 & C-2 and Subpart W §98.233 (n)
- Engine manufacturer specification sheets
- Turbine manufacturer specification sheets

Promax Report - Titan Treater Plant #2

Titan Treating Plant # 2
(220 MMSCFD)

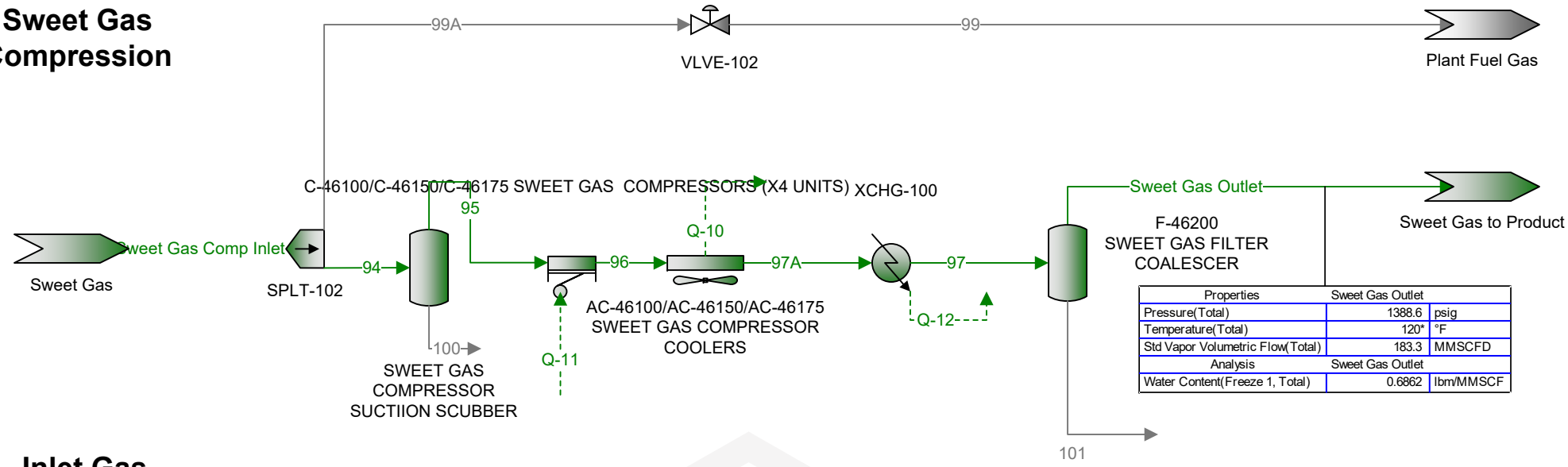


Properties	27	
Pressure(Total)	493.55	psig
Temperature(Total)	51.803	°F
Std Vapor Volumetric Flow(Total)	207.8	MMSCFD

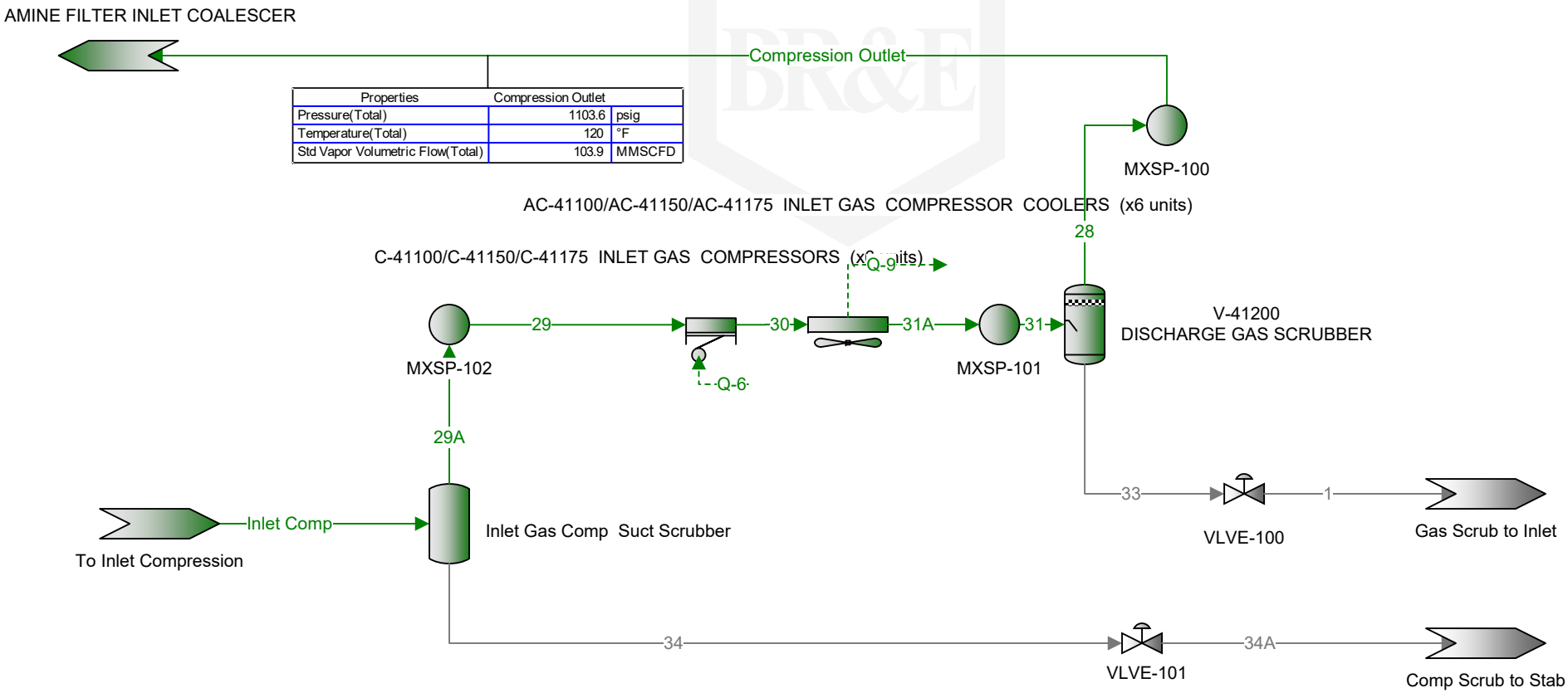
Properties	12	
Pressure(Total)	126.55	psig
Temperature(Total)	57.932	°F
Std Vapor Volumetric Flow(Total)	10.58	MMSCFD
Std Liquid Volumetric Flow(Total)	8006.7	bbl/d

Properties	19	
Pressure(Total)	3.5541*	psig
Temperature(Total)	120.17	°F
Std Vapor Volumetric Flow(Total)	2.166	MMSCFD

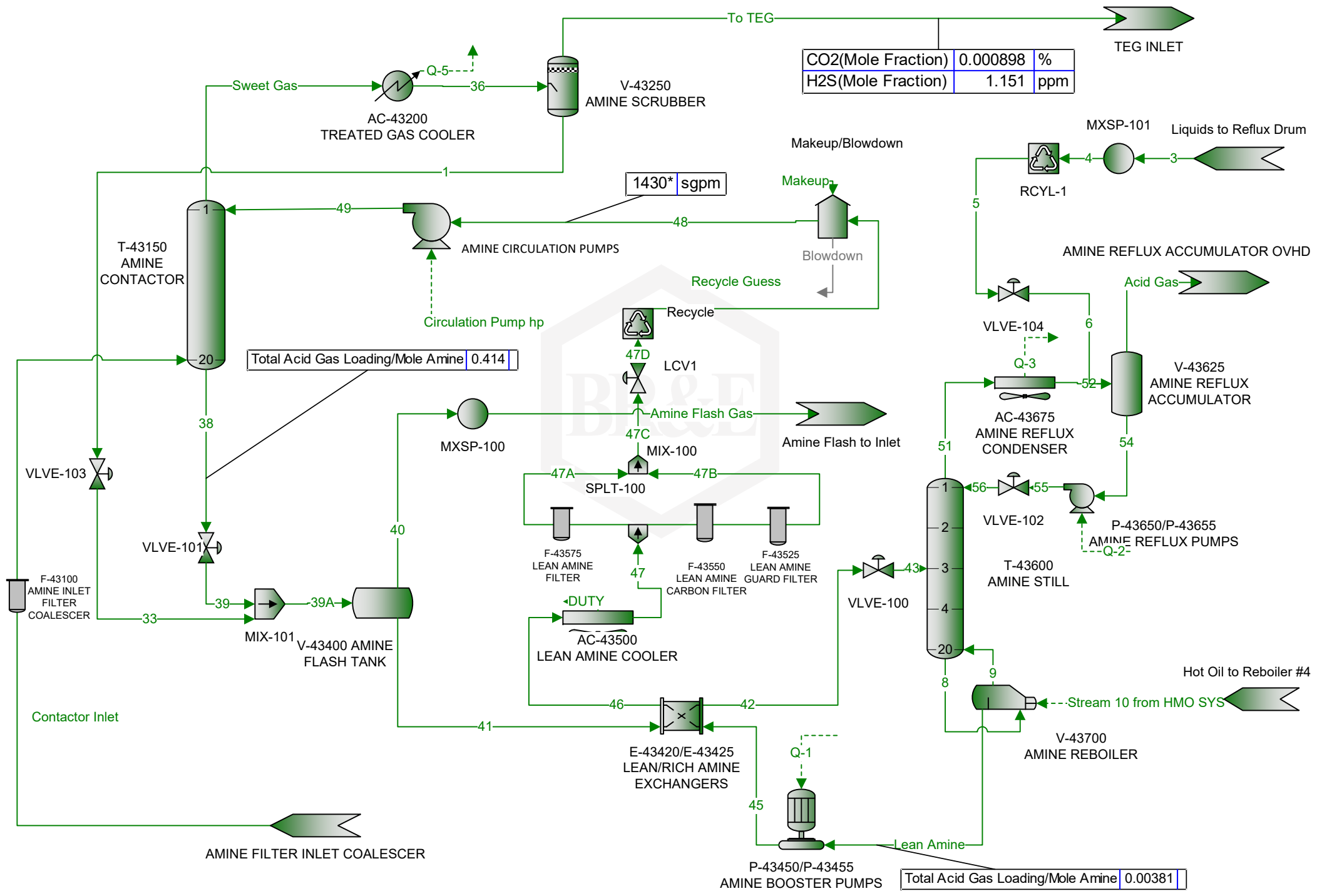
Sweet Gas Compression



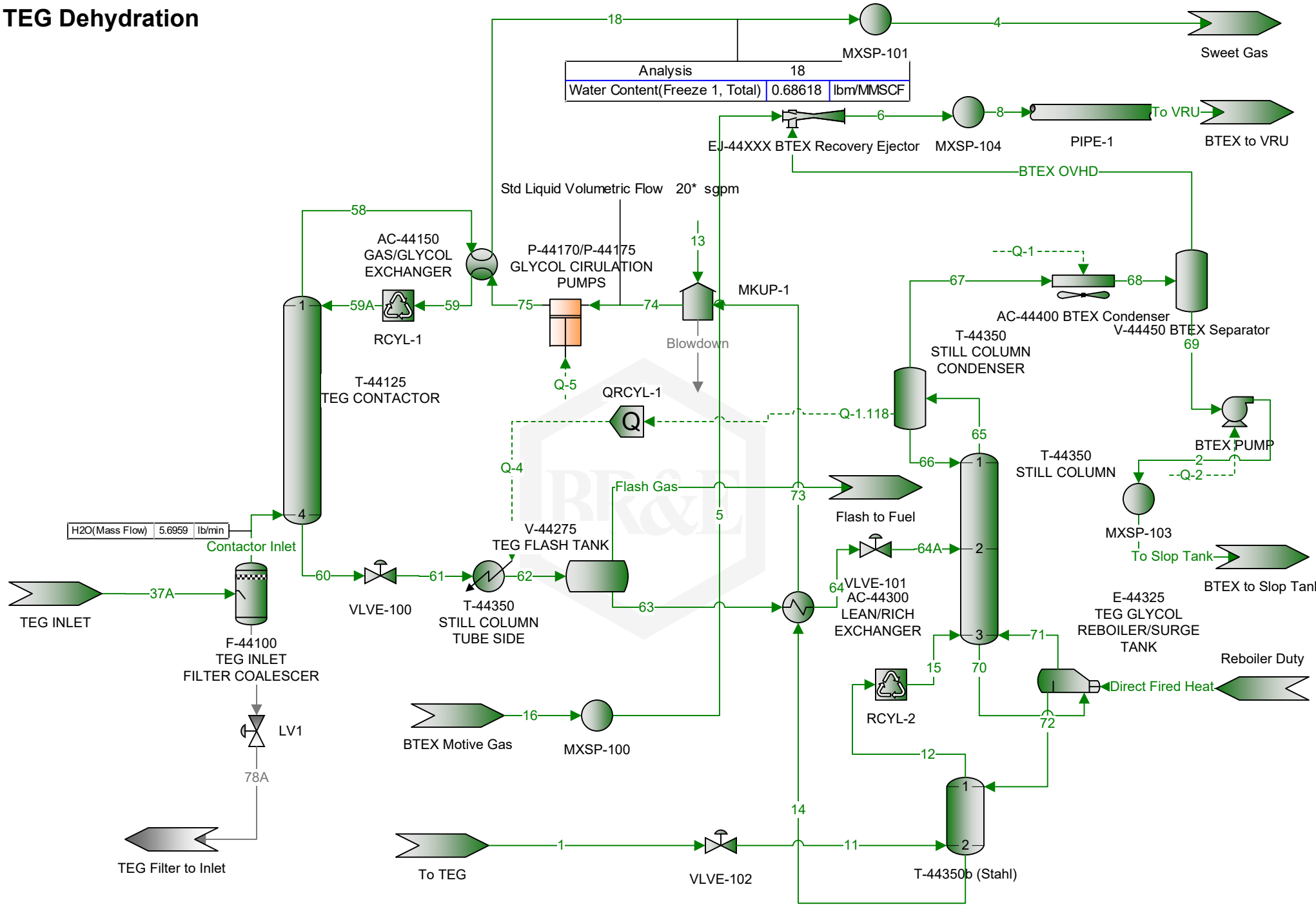
Inlet Gas Compression



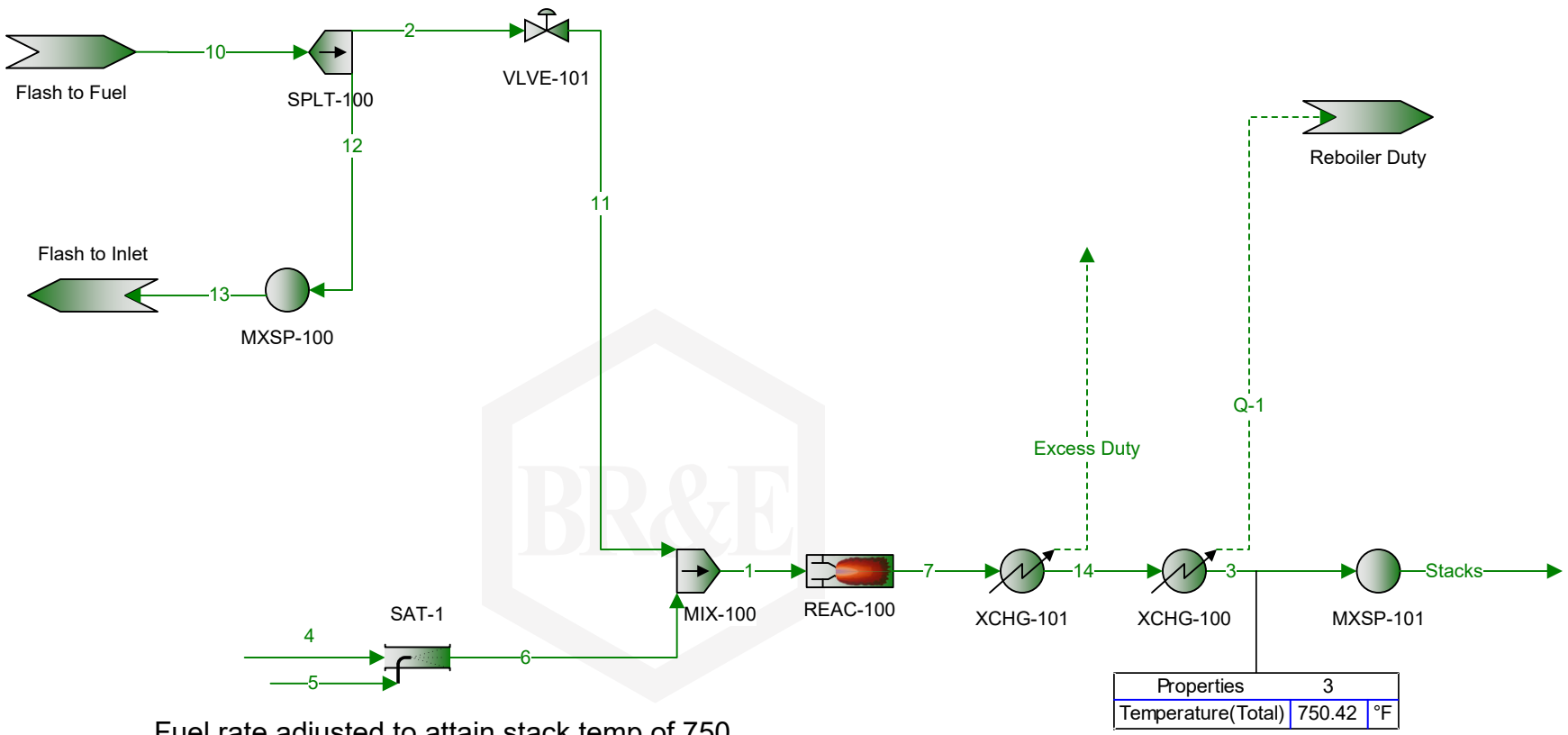
Amine System



TEG Dehydration

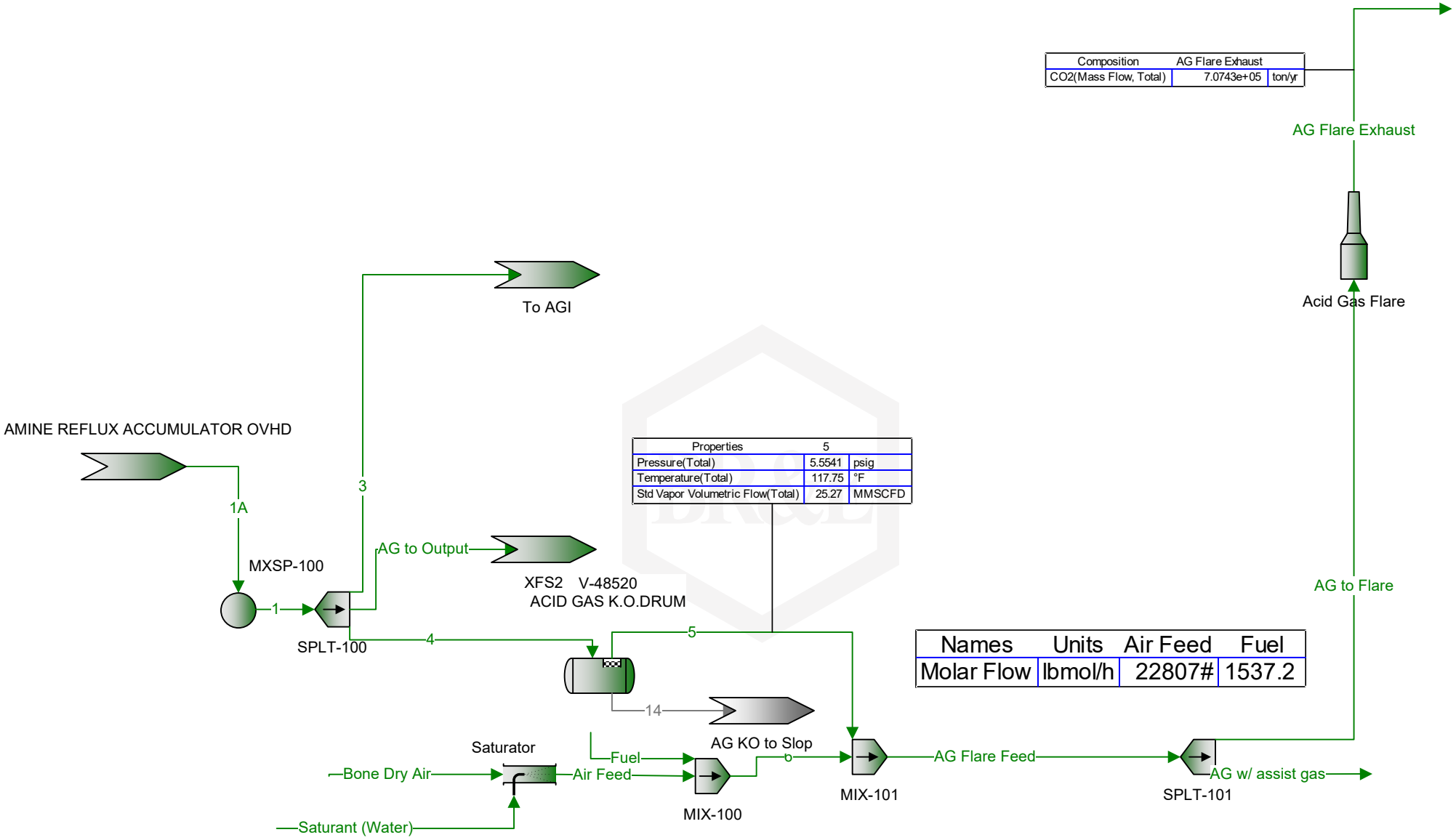


TEG Reboiler Burner



Fuel rate adjusted to attain stack temp of 750 (per QB Johnson) with an 85% fuel efficiency. Air rate adjusted for 20% excess oxygen.

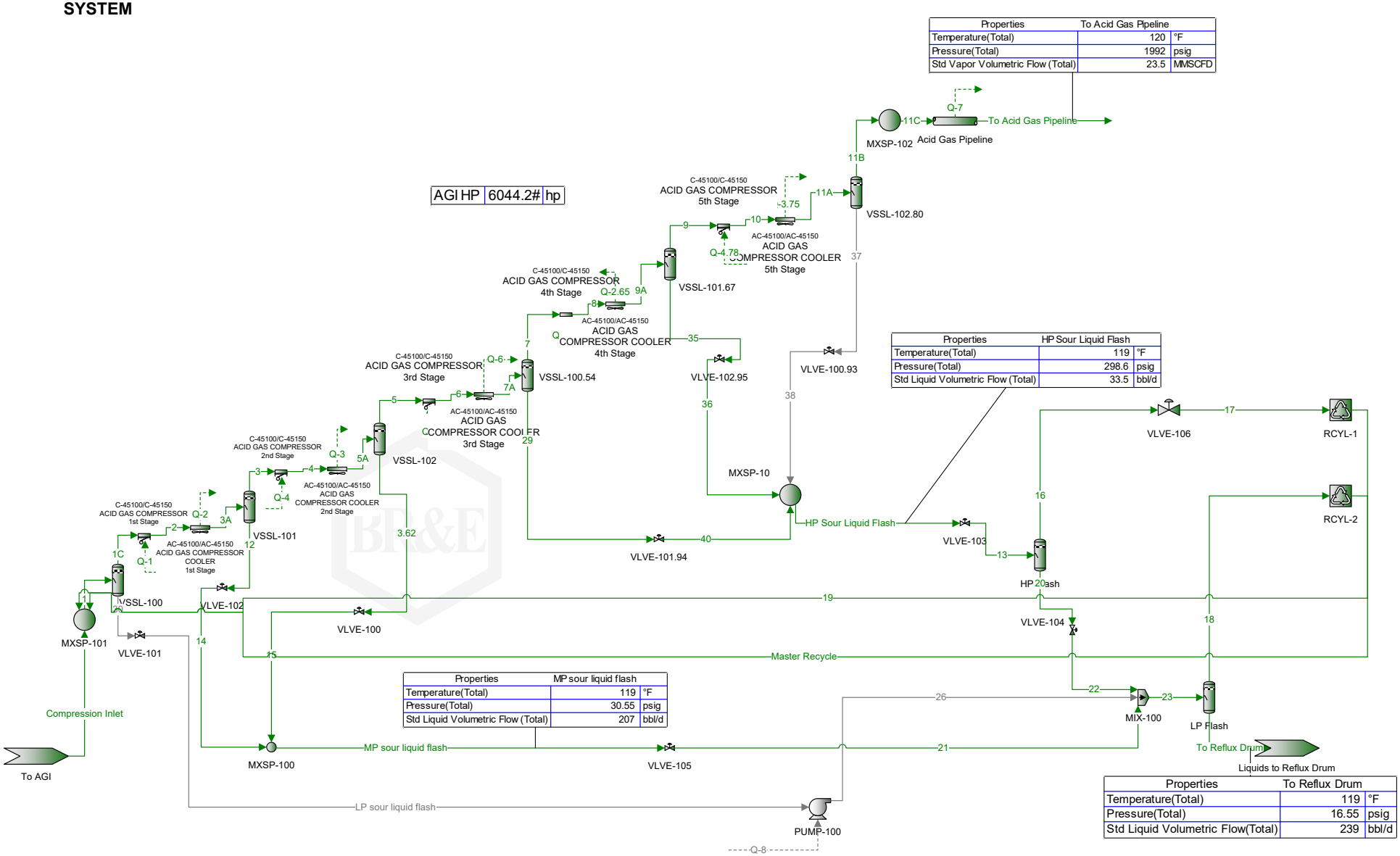
Acid Gas Flare



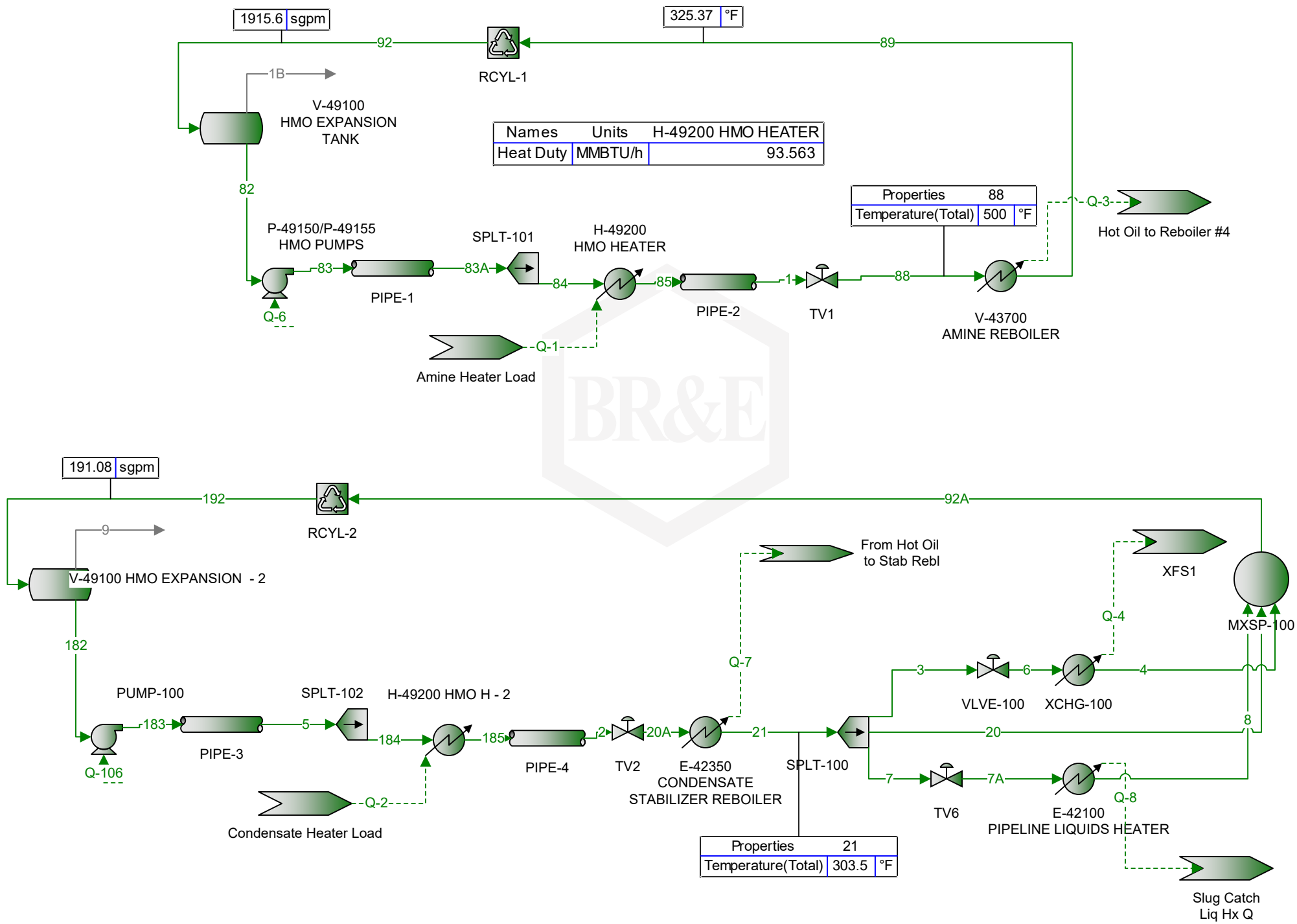
Air Rate Specifier sets the air flow to combust the combined Tail Gas and Fuel with 10% excess oxygen.

Fuel flow rate set to 14 MMSCFD per NW recommendation

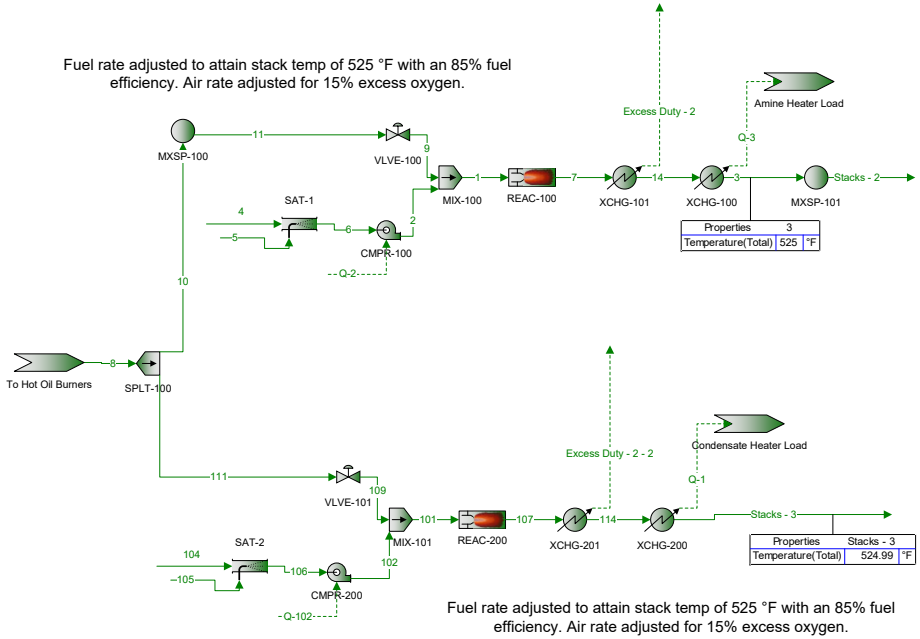
ACID GAS INJECTION SYSTEM

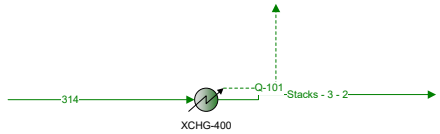


Hot Oil System

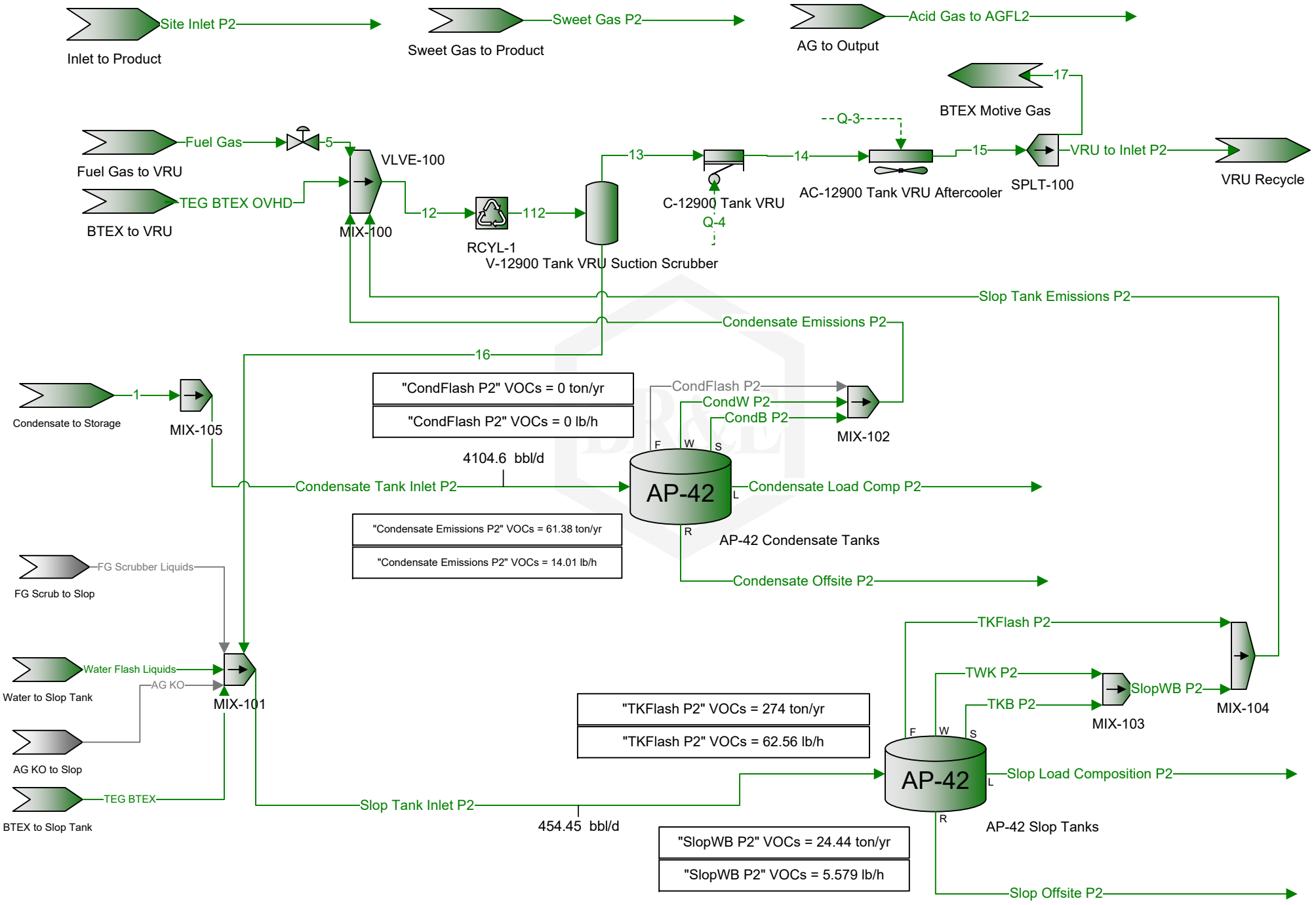


Hot Oil Burners

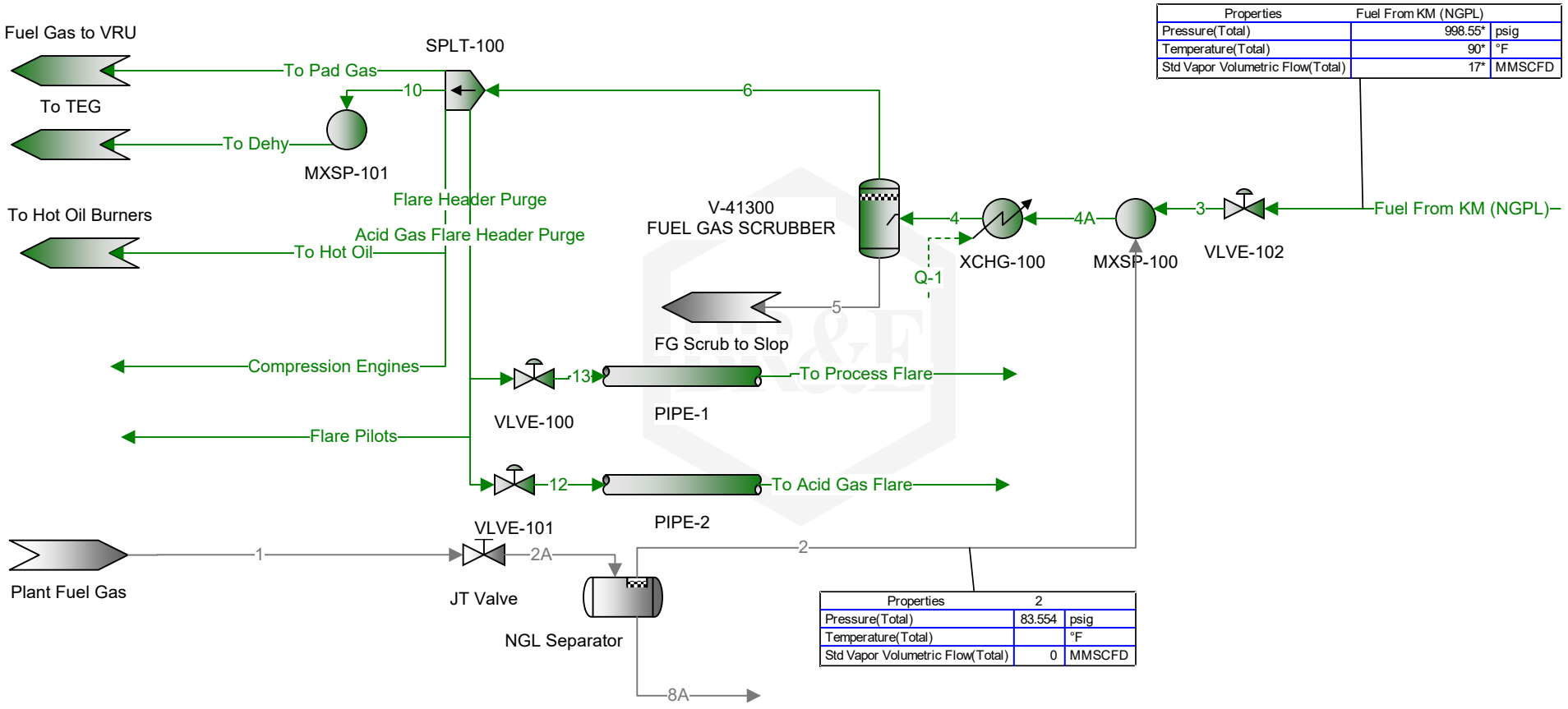




Emissions Streams



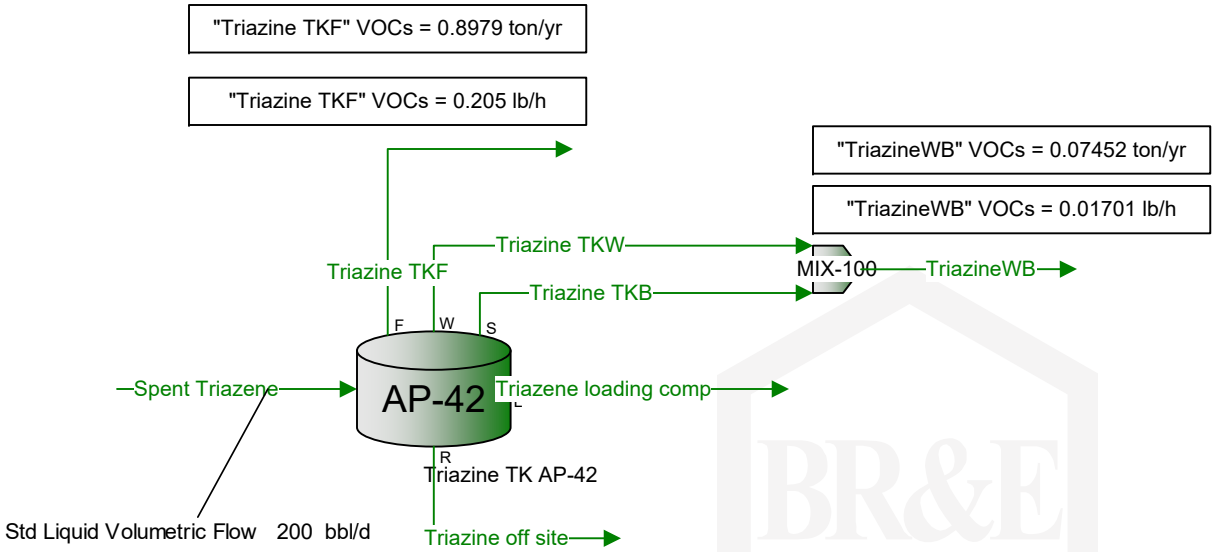
Fuel Gas



Properties	Fuel From KM (NGPL)	
Pressure(Total)	998.55*	psig
Temperature(Total)	90*	°F
Std Vapor Volumetric Flow(Total)	17*	MMSCFD

Properties	2	
Pressure(Total)	83.554	psig
Temperature(Total)		°F
Std Vapor Volumetric Flow(Total)	0	MMSCFD

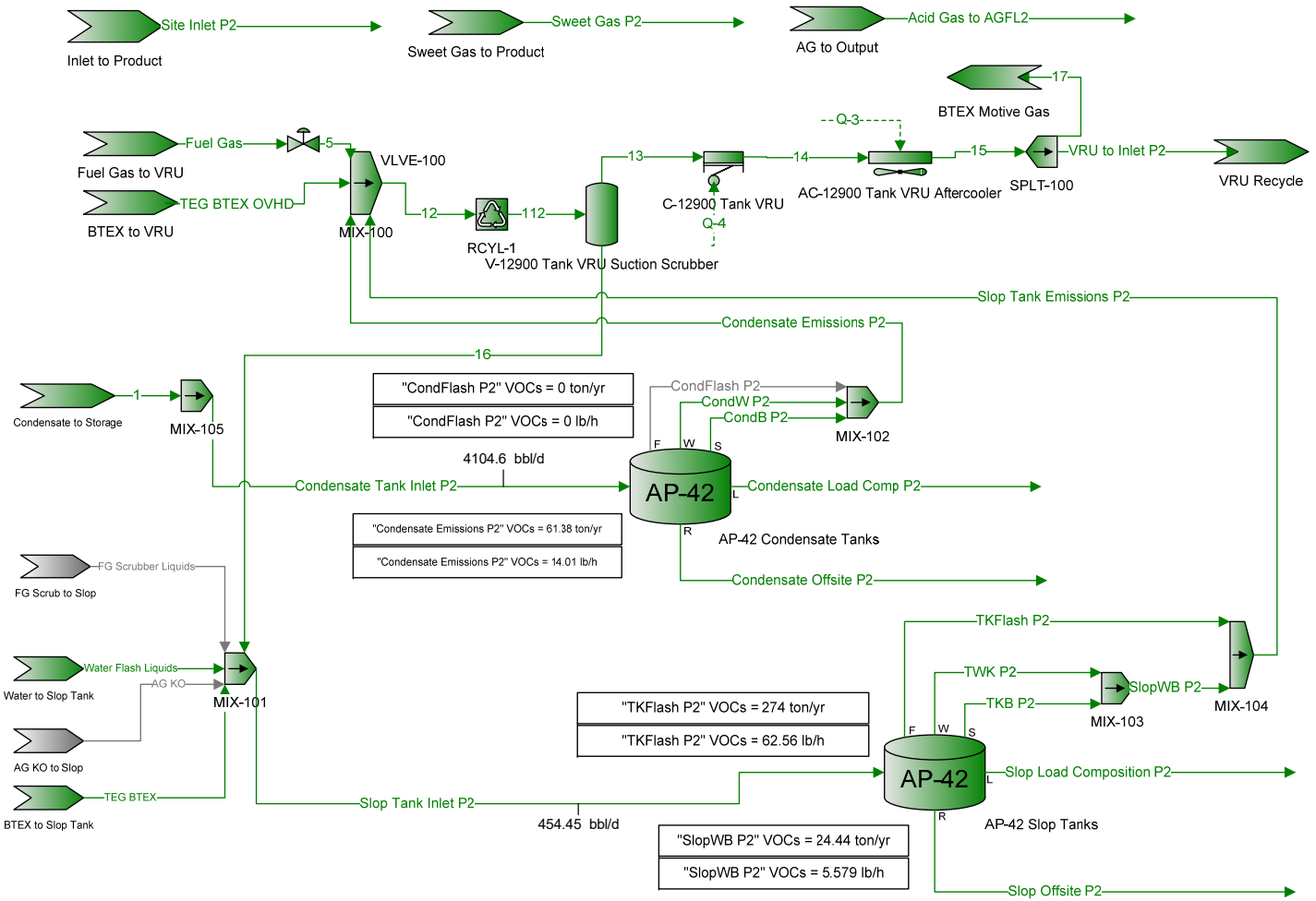
Triazine Tank



Emission Streams
Plant Schematic

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	Emission Streams	

Emissions Streams



* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:	
Location:	Titan Treater #2		
Flowsheet:	Emission Streams		

Connections

	Acid Gas to AGFL2	AG KO	CondB P2	Condensate Emissions P2	Condensate Load Comp P2
From Block	AG to Output	AG KO to Slop	AP-42 Condensate Tanks	MIX-102	AP-42 Condensate Tanks
To Block	--	MIX-101	MIX-102	MIX-100	--

Stream Composition

Mole Fraction	Acid Gas to AGFL2 %	AG KO %	CondB P2 %	Condensate Emissions P2 %	Condensate Load Comp P2 %
H2S	16.2703		2.10048E-07	2.10048E-07	2.40249E-07
H2O	7.29203		4.63086E-15	4.63086E-15	1.10402E-11
TEG	0		7.58534E-14	7.58534E-14	6.05638E-11
N2	0.000568096		0	0	0
CO2	76.1274		4.83796E-10	4.83796E-10	5.03451E-10
Methane	0.203722		2.44465E-12	2.44465E-12	9.07812E-12
Ethane	0.0671245		6.5916E-07	6.5916E-07	4.95889E-07
Propane	0.0214164		0.00108216	0.00108216	0.000995942
Isobutane	0.00156062		0.0802806	0.0802806	0.0725734
n-Butane	0.00571313		1.65272	1.65272	1.49254
Isopentane	0.000131341		32.3039	32.3039	31.6058
n-Pentane	0.000160909		40.9535	40.9535	40.3596
i-Hexane	1.59015E-05		15.6098	15.6098	15.9581
Heptane	1.64194E-07		1.91893	1.91893	1.78278
Octane	1.73505E-08		0.303917	0.303917	0.309884
Nonane	0		0.0149439	0.0149439	0.0175997
n-Decane	0		0.00121509	0.00121509	0.0016195
n-Hexane	3.43688E-06		4.52609	4.52609	4.41537
Benzene	0.00914534		2.16561	2.16561	3.31417
Toluene	0.00069728		0.431228	0.431228	0.614626
Ethylbenzene	7.70768E-06		0.0174608	0.0174608	0.0231148
o-Xylene	9.9448E-06		0.0193901	0.0193901	0.0311822
MDEA	0		1.20235E-08	1.20235E-08	4.18526E-05
Piperazine	0		2.33893E-09	2.33893E-09	8.98235E-07

Mass Fraction	Acid Gas to AGFL2 %	AG KO %	CondB P2 %	Condensate Emissions P2 %	Condensate Load Comp P2 %
H2S	13.713		9.46495E-08	9.46495E-08	1.08066E-07
H2O	3.24873		1.10304E-15	1.10304E-15	2.62504E-12
TEG	0		1.5061E-13	1.5061E-13	1.20039E-10
N2	0.00039356		0	0	0
CO2	82.8535		2.81512E-10	2.81512E-10	2.9243E-10
Methane	0.0808225		5.18533E-13	5.18533E-13	1.92214E-12
Ethane	0.0499142		2.62059E-07	2.62059E-07	1.96799E-07
Propane	0.0233543		0.000630922	0.000630922	0.000579626
Isobutane	0.00224318		0.0616937	0.0616937	0.0556722
n-Butane	0.00821182		1.27007	1.27007	1.14495
Isopentane	0.000234343		30.8157	30.8157	30.0964
n-Pentane	0.000287101		39.0668	39.0668	38.4322
i-Hexane	3.38878E-05		17.7856	17.7856	18.1503
Heptane	4.06872E-07		2.54229	2.54229	2.35772
Octane	4.90129E-08		0.459006	0.459006	0.467189
Nonane	0		0.0253413	0.0253413	0.0297919
n-Decane	0		0.00228584	0.00228584	0.00304123
n-Hexane	7.32439E-06		5.15696	5.15696	5.02192
Benzene	0.0176661		2.23659	2.23659	3.41673

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	Emission Streams	

Mass Fraction	Acid Gas to AGFL2 %	AG KO %	CondB P2 %	Condensate Emissions P2 %	Condensate Load Comp P2 %
Toluene	0.00158881		0.525335	0.525335	0.74743
Ethylbenzene	2.02362E-05		0.0245095	0.0245095	0.0323885
o-Xylene	2.61097E-05		0.0272177	0.0272177	0.0436926
MDEA	0		1.89433E-08	1.89433E-08	6.58233E-05
Piperazine	0		2.66372E-09	2.66372E-09	1.02115E-06

Mass Flow	Acid Gas to AGFL2 lb/h	AG KO lb/h	CondB P2 lb/h	Condensate Emissions P2 lb/h	Condensate Load Comp P2 lb/h
H2S	15386.9	0	1.15619E-09	1.32635E-08	3.52424E-08
H2O	3645.31	0	1.34742E-17	1.54572E-16	8.56073E-13
TEG	0	0	1.83978E-15	2.11054E-14	3.9147E-11
N2	0.441604	0	0	0	0
CO2	92967.8	0	3.43882E-12	3.9449E-11	9.53668E-11
Methane	90.6889	0	6.33416E-15	7.26633E-14	6.26845E-13
Ethane	56.0075	0	3.20118E-09	3.67229E-08	6.41797E-08
Propane	26.2052	0	7.70705E-06	8.84127E-05	0.000189027
Isobutane	2.51701	0	0.000753621	0.00864529	0.0181557
n-Butane	9.21428	0	0.0155146	0.177978	0.37339
Isopentane	0.262951	0	0.37643	4.31827	9.81497
n-Pentane	0.322148	0	0.477222	5.47453	12.5334
i-Hexane	0.0380247	0	0.21726	2.49233	5.91913
Heptane	0.00045654	0	0.0310554	0.356257	0.768895
Octane	5.49961E-05	0	0.005607	0.0643216	0.152359
Nonane	0	0	0.000309557	0.00355113	0.0097157
n-Decane	0	0	2.79228E-05	0.000320321	0.0009918
n-Hexane	0.0082185	0	0.062995	0.722658	1.63774
Benzene	19.8227	0	0.0273211	0.313419	1.11426
Toluene	1.78276	0	0.00641724	0.0736164	0.24375
Ethylbenzene	0.0227065	0	0.000299396	0.00343458	0.0105625
o-Xylene	0.029297	0	0.000332478	0.00381408	0.0142489
MDEA	0	0	2.31403E-10	2.65458E-09	2.14662E-05
Piperazine	0	0	3.25388E-11	3.73274E-10	3.33017E-07

Stream Properties

Property	Units	Acid Gas to AGFL2	AG KO	CondB P2	Condensate Emissions P2	Condensate Load Comp P2
Temperature	°F	118.003		73.4549	73.4549	73.4549
Pressure	psia	22.25	20.25	13.26	13.26	13.26
Molecular Weight	lb/lbmol	40.4368		75.6331	75.6331	75.7672
Mass Flow	lb/h	112207	0	1.22155	14.0132	32.6118
Std Vapor Volumetric Flow	MMSCFD	25.2726	0	0.000147097	0.00168745	0.00392011
Std Liquid Volumetric Flow	sgpm	274.337	0	0.00380684	0.0436708	0.101199
Net Ideal Gas Heating Value	Btu/ft^3	99.4974		3865.2	3865.2	3866.29
Gross Ideal Gas Heating Value	Btu/ft^3	111.735		4174.99	4174.99	4174.24

Remarks

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	Emission Streams	

Connections

	Condensate Offsite P2	Condensate Tank Inlet P2	CondFlash P2	CondW P2	FG Scrubber Liquids
From Block	AP-42 Condensate Tanks	MIX-105	AP-42 Condensate Tanks	AP-42 Condensate Tanks	FG Scrub to Slop
To Block	--	AP-42 Condensate Tanks	MIX-102	MIX-102	MIX-101

Stream Composition

Mole Fraction	Condensate Offsite P2 %	Condensate Tank Inlet P2 %	CondFlash P2 %	CondW P2 %	FG Scrubber Liquids %
H2S	3.5074E-09	3.58787E-09	2.23859E-07	2.10048E-07	
H2O	6.22895E-14	6.2267E-14	9.79868E-12	4.63086E-15	
TEG	6.20595E-08	6.20353E-08	7.28788E-11	7.58534E-14	
N2	0	0	0	0	
CO2	2.3766E-12	2.56416E-12	4.83587E-10	4.83796E-10	
Methane	1.48523E-14	1.57989E-14	8.32655E-12	2.44465E-12	
Ethane	5.34982E-09	5.60453E-09	4.68248E-07	6.5916E-07	
Propane	3.79299E-05	3.83367E-05	0.000936411	0.00108216	
Isobutane	0.00808866	0.00811679	0.0696301	0.0802806	
n-Butane	0.246992	0.24754	1.44399	1.65272	
Isopentane	12.9346	12.9421	31.1956	32.3039	
n-Pentane	22.2992	22.3064	40.2015	40.9535	
i-Hexane	21.1086	21.1065	16.1823	15.6098	
Heptane	12.6737	12.6695	1.8945	1.91893	
Octane	7.43433	7.43156	0.339495	0.303917	
Nonane	1.37817	1.37764	0.0198968	0.0149439	
n-Decane	0.401302	0.401146	0.00188337	0.00121509	
n-Hexane	8.66698	8.66536	4.5438	4.52609	
Benzene	6.70254	6.70077	3.3952	2.16561	
Toluene	4.62348	4.62185	0.651763	0.431228	
Ethylbenzene	0.583463	0.583242	0.0252895	0.0174608	
o-Xylene	0.937788	0.93743	0.0342137	0.0193901	
MDEA	0.000723831	0.000723549	4.30221E-05	1.20235E-08	
Piperazine	3.09592E-07	3.09472E-07	8.33895E-07	2.33893E-09	

Mass Fraction	Condensate Offsite P2 %	Condensate Tank Inlet P2 %	CondFlash P2 %	CondW P2 %	FG Scrubber Liquids %
H2S	1.39206E-09	1.42406E-09	1.0054E-07	9.46495E-08	
H2O	1.30682E-14	1.30641E-14	2.32629E-12	1.10304E-15	
TEG	1.08533E-07	1.08495E-07	1.44227E-10	1.5061E-13	
N2	0	0	0	0	
CO2	1.21805E-12	1.31423E-12	2.80463E-10	2.81512E-10	
Methane	2.77475E-15	2.95174E-15	1.76032E-12	5.18533E-13	
Ethane	1.87335E-09	1.96264E-09	1.85545E-07	2.62059E-07	
Propane	1.94777E-05	1.96875E-05	0.000544147	0.000630922	
Isobutane	0.00547494	0.00549423	0.0533327	0.0616937	
n-Butane	0.167181	0.167559	1.10601	1.27007	
Isopentane	10.8678	10.8747	29.6604	30.8157	
n-Pentane	18.736	18.743	38.2231	39.0668	
i-Hexane	21.1838	21.1826	18.3771	17.7856	
Heptane	14.7891	14.7849	2.50164	2.54229	
Octane	9.88956	9.88633	0.511049	0.459006	
Nonane	2.05844	2.05774	0.0336288	0.0253413	
n-Decane	0.664938	0.66471	0.00353133	0.00228584	
n-Hexane	8.69784	8.69662	5.16008	5.15696	
Benzene	6.09701	6.09568	3.49492	2.23659	
Toluene	4.96101	4.95949	0.79138	0.525335	

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	Emission Streams	

Mass Fraction	Condensate Offsite P2 %	Condensate Tank Inlet P2 %	CondFlash P2 %	CondW P2 %	FG Scrubber Liquids %
Ethylbenzene	0.721365	0.721126	0.0353814	0.0245095	
o-Xylene	1.15943	1.15905	0.0478669	0.0272177	
MDEA	0.00100447	0.00100412	6.75592E-05	1.89433E-08	
Piperazine	3.10551E-07	3.10445E-07	9.46561E-07	2.66372E-09	

Mass Flow	Condensate Offsite P2 lb/h	Condensate Tank Inlet P2 lb/h	CondFlash P2 lb/h	CondW P2 lb/h	FG Scrubber Liquids lb/h
H2S	5.68265E-07	5.81528E-07	0	1.21073E-08	0
H2O	5.3347E-12	5.33486E-12	0	1.41097E-16	0
TEG	4.43052E-05	4.43052E-05	0	1.92656E-14	0
N2	0	0	0	0	0
CO2	4.9723E-10	5.36679E-10	0	3.60102E-11	0
Methane	1.13271E-12	1.20537E-12	0	6.63292E-14	0
Ethane	7.64739E-07	8.01462E-07	0	3.35217E-08	0
Propane	0.00795118	0.00803959	0	8.07056E-05	0
Isobutane	2.23498	2.24362	0	0.00789167	0
n-Butane	68.2465	68.4245	0	0.162464	0
Isopentane	4436.46	4440.77	0	3.94184	0
n-Pentane	7648.42	7653.9	0	4.99731	0
i-Hexane	8647.64	8650.13	0	2.27507	0
Heptane	6037.19	6037.55	0	0.325201	0
Octane	4037.11	4037.18	0	0.0587146	0
Nonane	840.297	840.3	0	0.00324158	0
n-Decane	271.441	271.441	0	0.000292398	0
n-Hexane	3550.63	3551.35	0	0.659663	0
Benzene	2488.92	2489.23	0	0.286097	0
Toluene	2025.18	2025.26	0	0.0671992	0
Ethylbenzene	294.476	294.479	0	0.00313518	0
o-Xylene	473.304	473.308	0	0.0034816	0
MDEA	0.410044	0.410044	0	2.42317E-09	0
Piperazine	0.000126773	0.000126773	0	3.40735E-10	0

Stream Properties

Property	Units	Condensate Offsite P2	Condensate Tank Inlet P2	CondFlash P2	CondW P2	FG Scrubber Liquids
Temperature	°F	73.4549	120.167	73.4549	73.4549	
Pressure	psia	13.26	18.25	13.26	13.26	133.25
Molecular Weight	lb/lbmol	85.8696	85.8656	75.8832	75.6331	
Mass Flow	lb/h	40822	40836	0	12.7917	0
Std Vapor Volumetric Flow	MMSCFD	4.32972	4.3314	0	0.00154036	0
Std Liquid Volumetric Flow	sgpm	119.674	119.718	0	0.039864	0
Net Ideal Gas Heating Value	Btu/ft^3	4331.54	4331.36	3871.55	3865.2	
Gross Ideal Gas Heating Value	Btu/ft^3	4660.52	4660.33	4179.7	4174.99	

Remarks

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	Emission Streams	

Connections

	Fuel Gas	Site Inlet P2	Slop Load Composition P2	Slop Offsite P2	Slop Tank Emissions P2
From Block	Fuel Gas to VRU	Inlet to Product	AP-42 Slop Tanks	AP-42 Slop Tanks	MIX-104
To Block	VLVE-100	--	--	--	MIX-100

Stream Composition

Mole Fraction	Fuel Gas %	Site Inlet P2 %	Slop Load Composition P2 %	Slop Offsite P2 %	Slop Tank Emissions P2 %
H2S	0	2	9.41264	0.00236629	2.94238
H2O	0	0	14.3934	99.9469	3.22485
TEG	0	0	2.01953E-11	4.97237E-05	7.68671E-12
N2	1.89607	1.6713	0	0	0.00402347
CO2	0.0671419	8.9995	0	0	2.44615
Methane	95.832	60.2288	0	0	0.979952
Ethane	1.81344	12.9825	0	0	6.17208
Propane	0.0681546	7.7155	0	0	22.4853
Isobutane	0.00405079	1.0166	0	0	7.65566
n-Butane	0.0140765	2.619	0	0	25.3952
Isopentane	0.00860793	0.7346	3.02006	0.000176881	10.6841
n-Pentane	0.0130638	0.7083	21.5908	0.00164405	9.46051
i-Hexane	0.283353	0.4453	25.6554	0.00484723	4.50699
Heptane	0	0.2539	7.67732	0.00743682	1.04767
Octane	0	0.1505	1.71793	0.00562043	0.229838
Nonane	0	0.0281	0.106766	0.00113621	0.0144036
n-Decane	0	0.0082	0.00951207	0.000340249	0.00139743
n-Hexane	0	0.1768	9.72733	0.00273892	1.52472
Benzene	0	0.1378	4.44756	0.00407489	0.869923
Toluene	0	0.0925	1.98689	0.00304893	0.315796
Ethylbenzene	0	0.0118	0.109518	0.000449196	0.0167467
o-Xylene	0	0.019	0.144089	0.000738219	0.0221627
MDEA	0	0	0.00083855	2.17649E-05	0.000151005
Piperazine	0	0	1.40684E-06	0.0184388	4.36731E-07

Mass Fraction	Fuel Gas %	Site Inlet P2 %	Slop Load Composition P2 %	Slop Offsite P2 %	Slop Tank Emissions P2 %
H2S	0	2.57522	4.62041	0.00446704	1.79466
H2O	0	0	3.73474	99.7357	1.03974
TEG	0	0	4.36816E-11	0.000413615	2.06589E-11
N2	3.16537	1.76886	0	0	0.00201716
CO2	0.176093	14.9637	0	0	1.92665
Methane	91.6187	36.5047	0	0	0.281352
Ethane	3.24956	14.7486	0	0	3.32143
Propane	0.179099	12.8538	0	0	17.7447
Isobutane	0.0140309	2.23237	0	0	7.9634
n-Butane	0.0487573	5.7511	0	0	26.4161
Isopentane	0.037011	2.00241	3.13836	0.000706889	13.7955
n-Pentane	0.0561696	1.93072	22.4365	0.00657028	12.2157
i-Hexane	1.45517	1.4498	31.8434	0.0231375	6.95094
Heptane	0	0.961196	11.0801	0.0412766	1.87877
Octane	0	0.649507	2.82642	0.0355619	0.469862
Nonane	0	0.136161	0.197226	0.00807188	0.0330612
n-Decane	0	0.0440794	0.0194931	0.00268155	0.00355839
n-Hexane	0	0.575623	12.0735	0.0130738	2.3515
Benzene	0	0.406667	5.00376	0.0176308	1.21611
Toluene	0	0.322	2.63678	0.0155607	0.52074

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	Emission Streams	

Mass Fraction	Fuel Gas %	Site Inlet P2 %	Slop Load Composition P2 %	Slop Offsite P2 %	Slop Tank Emissions P2 %
Ethylbenzene	0	0.04733	0.167466	0.00264154	0.0318189
o-Xylene	0	0.0762093	0.220328	0.00434118	0.0421093
MDEA	0	0	0.00143921	0.00014366	0.000322035
Piperazine	0	0	1.74537E-06	0.0879745	6.73241E-07

Mass Flow	Fuel Gas lb/h	Site Inlet P2 lb/h	Slop Load Composition P2 lb/h	Slop Offsite P2 lb/h	Slop Tank Emissions P2 lb/h
H2S	0	16462.5	0.0765716	0.290204	1.33449
H2O	0	0	0.061894	6479.38	0.77314
TEG	0	0	7.23913E-13	0.0268707	1.53617E-11
N2	2.85731	11307.7	0	0	0.00149994
CO2	0.158956	95657.4	0	0	1.43264
Methane	82.7023	233361	0	0	0.20921
Ethane	2.93331	94282.6	0	0	2.46978
Propane	0.161669	82170	0	0	13.1948
Isobutane	0.0126654	14270.7	0	0	5.9215
n-Butane	0.0440122	36764.7	0	0	19.6427
Isopentane	0.033409	12800.7	0.0520104	0.0459234	10.2582
n-Pentane	0.0507031	12342.4	0.371829	0.426842	9.08345
i-Hexane	1.31355	9268.08	0.527724	1.50314	5.16864
Heptane	0	6144.59	0.183625	2.68156	1.39703
Octane	0	4152.07	0.0468408	2.3103	0.349385
Nonane	0	870.432	0.00326853	0.524394	0.024584
n-Decane	0	281.784	0.00032305	0.174209	0.00264598
n-Hexane	0	3679.76	0.200088	0.849349	1.74855
Benzene	0	2599.68	0.0829246	1.1454	0.904284
Toluene	0	2058.43	0.0436979	1.01091	0.387217
Ethylbenzene	0	302.564	0.00277532	0.171609	0.0236602
o-Xylene	0	487.179	0.00365138	0.282027	0.031312
MDEA	0	0	2.38513E-05	0.00933297	0.000239462
Piperazine	0	0	2.89251E-08	5.71531	5.00614E-07

Stream Properties

Property	Units	Fuel Gas	Site Inlet P2	Slop Load Composition P2	Slop Offsite P2	Slop Tank Emissions P2
Temperature	°F	79.8061	50	73.4479	73.4479	71.9208
Pressure	psia	133.25	563.25	13.26	13.26	13.26
Molecular Weight	lb/lbmol	16.7802	26.4684	69.4292	18.0534	55.8761
Mass Flow	lb/h	90.2679 *	639265	1.65725	6496.55	74.3589
Std Vapor Volumetric Flow	MMSCFD	0.0489938	219.968	0.000217395	3.27739	0.0121203
Std Liquid Volumetric Flow	sgpm	0.580367	3052.8	0.00484426	13.0002	0.254643
Net Ideal Gas Heating Value	Btu/ft^3	916.235	1172.91	3279.22	2.14317	2766.55
Gross Ideal Gas Heating Value	Btu/ft^3	1016.62	1287.64	3540.73	52.5847	2997.69

Remarks

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	Emission Streams	

Connections

	Slop Tank Inlet P2	SlopWB P2	Sweet Gas P2	TEG BTEX	TEG BTEX OVHD
From Block	MIX-101	MIX-103	Sweet Gas to Product	BTEX to Slop Tank	BTEX to VRU
To Block	AP-42 Slop Tanks	MIX-104	--	MIX-101	MIX-100

Stream Composition

Mole Fraction	Slop Tank Inlet P2 %	SlopWB P2 %	Sweet Gas P2 %	TEG BTEX %	TEG BTEX OVHD %
H2S	0.0131988	5.52638	0.000114052	6.03861E-07	0.0120694
H2O	99.5905	5.30354	0.00144539	99.9783	13.6339
TEG	4.95405E-05	8.5178E-12	0.000204894	2.1778E-05	1.85523E-10
N2	1.48245E-05	0.00018491	1.99923	1.3714E-05	1.50981
CO2	0.00901288	3.97502	0.000897751	1.58791E-05	0.0628785
Methane	0.00361065	0.0962262	71.4628	0.00141298	76.8493
Ethane	0.0227411	1.1809	14.7004	6.20542E-05	2.76297
Propane	0.0828475	6.59832	7.96382	2.862E-05	1.91147
Isobutane	0.0282074	4.64798	0.922414	2.37866E-06	0.308053
n-Butane	0.0935691	21.9077	2.24936	1.82708E-05	1.34602
Isopentane	0.0395418	19.1183	0.394154	2.8462E-06	0.38742
n-Pentane	0.0364954	16.8128	0.244626	1.39798E-06	0.332776
i-Hexane	0.0214354	7.88984	0.0406887	6.02897E-07	0.300777
Heptane	0.0112696	1.77107	0.00221237	1.41394E-08	0.0122467
Octane	0.00644656	0.379421	0.000175271	7.95747E-10	0.00184843
Nonane	0.0011851	0.0232089	3.40638E-06	1.23264E-11	8.53811E-05
n-Decane	0.000344144	0.00220273	1.84137E-07	3.15643E-13	7.6603E-06
n-Hexane	0.00834667	2.63931	0.00923115	5.87831E-08	0.0269788
Benzene	0.00726512	1.52331	0.00746154	0.000609086	0.467089
Toluene	0.00420125	0.539492	0.000715019	6.9724E-05	0.0693939
Ethylbenzene	0.000509244	0.0277665	1.44384E-05	1.49999E-06	0.00198301
o-Xylene	0.000817158	0.036699	1.45289E-05	3.10616E-06	0.00268931
MDEA	2.22411E-05	0.000292772	8.45933E-08	2.50656E-05	0.000199123
Piperazine	0.0183709	5.5707E-07	6.89644E-05	0.0193931	1.06826E-05

Mass Fraction	Slop Tank Inlet P2 %	SlopWB P2 %	Sweet Gas P2 %	TEG BTEX %	TEG BTEX OVHD %
H2S	0.0247256	3.02331	0.000174197	1.1415E-06	0.0215077
H2O	98.6189	1.53369	0.00116695	99.9024	12.8427
TEG	0.000408934	2.05329E-11	0.00137895	0.000181401	1.45675E-09
N2	2.2827E-05	8.31492E-05	2.50989	2.13088E-05	2.2115
CO2	0.0218028	2.80813	0.00177064	3.87615E-05	0.144692
Methane	0.00318388	0.0247797	51.378	0.00125729	64.4627
Ethane	0.0375865	0.569987	19.8096	0.000103495	4.34403
Propane	0.200806	4.67046	15.7378	6.99994E-05	4.40718
Isobutane	0.0901169	4.33648	2.40267	7.66839E-06	0.936191
n-Butane	0.298934	20.4395	5.85906	5.89018E-05	4.09065
Isopentane	0.156815	22.1416	1.27445	1.139E-05	1.46153
n-Pentane	0.144733	19.4716	0.790967	5.59445E-06	1.25539
i-Hexane	0.101535	10.914	0.157139	2.88174E-06	1.35527
Heptane	0.0620704	2.84868	0.00993483	7.85844E-08	0.064164
Octane	0.0404766	0.695707	0.000897245	5.04172E-09	0.0110401
Nonane	0.00835467	0.0477815	1.95792E-05	8.7688E-11	0.000572577
n-Decane	0.00269148	0.00503084	1.17413E-06	2.491E-12	5.69892E-05
n-Hexane	0.0395364	3.65093	0.0356505	2.80973E-07	0.121564
Benzene	0.0311933	1.91002	0.0261199	0.00263891	1.90772
Toluene	0.0212775	0.797915	0.00295247	0.00035633	0.334318
Ethylbenzene	0.00297172	0.0473187	6.86955E-05	8.83282E-06	0.0110079
o-Xylene	0.00476857	0.0625412	6.91261E-05	1.82909E-05	0.0149286

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	Emission Streams	

Mass Fraction	Slop Tank Inlet P2 %	SlopWB P2 %	Sweet Gas P2 %	TEG BTEX %	TEG BTEX OVHD %
MDEA	0.000145679	0.000560014	4.51753E-07	0.000165671	0.00124067
Piperazine	0.086979	7.70235E-07	0.000266216	0.0926527	4.81122E-05

Mass Flow	Slop Tank Inlet P2 lb/h	SlopWB P2 lb/h	Sweet Gas P2 lb/h	TEG BTEX lb/h	TEG BTEX OVHD lb/h
H2S	1.6247	0.183261	0.782407	6.90517E-06	0.134039
H2O	6480.16	0.0929664	5.24136	604.329	80.0376
TEG	0.0268707	1.24462E-12	6.19356	0.00109733	9.07868E-09
N2	0.00149994	5.04018E-06	11273.2	0.000128901	13.7823
CO2	1.43264	0.170218	7.95284	0.000234476	0.901742
Methane	0.20921	0.00150205	230765	0.00760562	401.74
Ethane	2.46978	0.0345504	88975	0.000626062	27.0726
Propane	13.1948	0.283105	70686.5	0.00042344	27.4661
Isobutane	5.9215	0.26286	10791.6	4.63876E-05	5.83447
n-Butane	19.6427	1.23896	26316	0.000356309	25.4935
Isopentane	10.3041	1.34214	5724.2	6.89003E-05	9.10847
n-Pentane	9.51029	1.18029	3552.64	3.3842E-05	7.82376
i-Hexane	6.67179	0.661562	705.792	1.74322E-05	8.44622
Heptane	4.07859	0.172676	44.6225	4.75372E-07	0.399879
Octane	2.65968	0.0421711	4.02999	3.04984E-08	0.0688037
Nonane	0.548978	0.00289633	0.0879401	5.30442E-10	0.00356838
n-Decane	0.176854	0.00030495	0.00527364	1.50686E-11	0.000355164
n-Hexane	2.5979	0.221305	160.125	1.69966E-06	0.7576
Benzene	2.04968	0.115778	117.318	0.0159633	11.8891
Toluene	1.39812	0.0483665	13.2611	0.00215551	2.08351
Ethylbenzene	0.195269	0.00286828	0.308547	5.34315E-05	0.0686027
o-Xylene	0.313339	0.003791	0.310481	0.000110645	0.0930372
MDEA	0.00957243	3.39458E-05	0.00202906	0.00100218	0.00773205
Piperazine	5.71531	4.66887E-08	1.19571	0.560475	0.000299842

Stream Properties

Property	Units	Slop Tank Inlet P2	SlopWB P2	Sweet Gas P2	TEG BTEX	TEG BTEX OVHD
Temperature	°F	164.149	73.4479	120	187.106	132.009
Pressure	psia	13.26	13.26	1403.25	23.25	13.7122
Molecular Weight	lb/lbmol	18.1928	62.2973	22.3138	18.029	19.1251
Mass Flow	lb/h	6570.91	6.06161	449152	604.92	623.214
Std Vapor Volumetric Flow	MMSCFD	3.28951	0.000886184	183.326	0.305585	0.296783
Std Liquid Volumetric Flow	sgpm	13.2549	0.0192807	2505.26	1.20976	3.35835
Net Ideal Gas Heating Value	Btu/ft^3	12.3287	2992.63	1193.92	0.659156	899.481
Gross Ideal Gas Heating Value	Btu/ft^3	63.436	3238.05	1314.09	51.0098	1000.07

Remarks

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	Emission Streams	

Connections

	TKB P2	TKFlash P2	TWK P2	VRU to Inlet P2	Water Flash Liquids
From Block	AP-42 Slop Tanks	AP-42 Slop Tanks	AP-42 Slop Tanks	SPLT-100	Water to Slop Tank
To Block	MIX-103	MIX-104	MIX-103	VRU Recycle	MIX-101

Stream Composition

Mole Fraction	TKB P2 %	TKFlash P2 %	TWK P2 %	VRU to Inlet P2 %	Water Flash Liquids %
H2S	5.52638	2.73854	5.52638	0.126772	0.0943724
H2O	5.30354	3.06088	5.30354	13.0673	97.2052
TEG	8.5178E-12	7.62115E-12	8.5178E-12	1.32252E-12	0.000220423
N2	0.00018491	0.00432627	0.00018491	1.44411	2.16632E-05
CO2	3.97502	2.32555	3.97502	0.155938	0.0643479
Methane	0.0962262	1.04966	0.0962262	73.5356	0.017128
Ethane	1.1809	6.5658	1.1809	2.88418	0.162226
Propane	6.59832	23.7385	6.59832	2.70872	0.592216
Isobutane	4.64798	7.89292	4.64798	0.594881	0.20168
n-Butane	21.9077	25.6703	21.9077	2.29088	0.668944
Isopentane	19.1183	10.0187	19.1183	0.964596	0.282722
n-Pentane	16.8128	8.88054	16.8128	0.911455	0.260948
i-Hexane	7.88984	4.24014	7.88984	0.549046	0.153268
Heptane	1.77107	0.990601	1.77107	0.0631767	0.0805818
Octane	0.379421	0.218039	0.379421	0.0124215	0.0460955
Nonane	0.0232089	0.013709	0.0232089	0.000727002	0.00847391
n-Decane	0.00220273	0.00133391	0.00220273	6.86609E-05	0.00246077
n-Hexane	2.63931	1.43679	2.63931	0.110126	0.0596817
Benzene	1.52331	0.818381	1.52331	0.492561	0.0482022
Toluene	0.539492	0.29815	0.539492	0.0810797	0.0296117
Ethylbenzene	0.0277665	0.0158774	0.0277665	0.00264733	0.00363207
o-Xylene	0.036699	0.0210161	0.036699	0.00354542	0.0058239
MDEA	0.000292772	0.000139822	0.000292772	0.000196328	4.88044E-06
Piperazine	5.5707E-07	4.27238E-07	5.5707E-07	3.42022E-06	0.0121601

Mass Fraction	TKB P2 %	TKFlash P2 %	TWK P2 %	VRU to Inlet P2 %	Water Flash Liquids %
H2S	3.02331	1.68562	3.02331	0.206993	0.167513
H2O	1.53369	0.995901	1.53369	11.2784	91.2059
TEG	2.05329E-11	2.067E-11	2.05329E-11	9.51513E-12	0.00172401
N2	8.31492E-05	0.00218881	8.31492E-05	1.93815	3.16069E-05
CO2	2.80813	1.84842	2.80813	0.328791	0.147494
Methane	0.0247797	0.304123	0.0247797	56.5183	0.014311
Ethane	0.569987	3.56563	0.569987	4.15491	0.254058
Propane	4.67046	18.9051	4.67046	5.72244	1.36009
Isobutane	4.33648	8.2853	4.33648	1.65651	0.610515
n-Butane	20.4395	26.9465	20.4395	6.3792	2.025
Isopentane	22.1416	13.0548	22.1416	3.33423	1.06238
n-Pentane	19.4716	11.5717	19.4716	3.15054	0.980563
i-Hexane	10.914	6.59921	10.914	2.2668	0.687904
Heptane	2.84868	1.79268	2.84868	0.303287	0.420538
Octane	0.695707	0.449818	0.695707	0.0679783	0.274237
Nonane	0.0477815	0.0317547	0.0477815	0.00446716	0.0566045
n-Decane	0.00503084	0.00342771	0.00503084	0.000468036	0.0182353
n-Hexane	3.65093	2.23618	3.65093	0.454667	0.267865
Benzene	1.91002	1.15452	1.91002	1.84331	0.196099
Toluene	0.797915	0.49614	0.797915	0.35791	0.142101
Ethylbenzene	0.0473187	0.0304432	0.0473187	0.0134651	0.020083
o-Xylene	0.0625412	0.0402959	0.0625412	0.0180331	0.0322023
MDEA	0.000560014	0.000300913	0.000560014	0.00112084	3.02893E-05

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	Emission Streams	

Mass Fraction	TKB P2 %	TKFlash P2 %	TWK P2 %	VRU to Inlet P2 %	Water Flash Liquids %
Piperazine	7.70235E-07	6.64632E-07	7.70235E-07	1.41142E-05	0.0545523

Mass Flow	TKB P2 lb/h	TKFlash P2 lb/h	TWK P2 lb/h	VRU to Inlet P2 lb/h	Water Flash Liquids lb/h
H2S	0.0261856	1.15123	0.157075	1.34448	0.175635
H2O	0.0132837	0.680174	0.0796827	73.2561	95.628
TEG	1.77841E-13	1.41171E-11	1.06678E-12	6.18033E-11	0.0018076
N2	7.20176E-07	0.0014949	4.32E-06	12.5888	3.31393E-05
CO2	0.0243219	1.26242	0.145896	2.13559	0.154645
Methane	0.000214623	0.207708	0.00128742	367.102	0.0150049
Ethane	0.0049368	2.43523	0.0296136	26.9873	0.266376
Propane	0.040452	12.9116	0.242653	37.1688	1.42604
Isobutane	0.0375593	5.65864	0.225301	10.7595	0.640116
n-Butane	0.177031	18.4037	1.06193	41.4346	2.12318
Isopentane	0.191774	8.91608	1.15036	21.6567	1.11389
n-Pentane	0.168648	7.90316	1.01164	20.4636	1.02811
i-Hexane	0.0945286	4.50708	0.567033	14.7235	0.721257
Heptane	0.0246732	1.22435	0.148003	1.96993	0.440928
Octane	0.0060257	0.307214	0.0361454	0.441538	0.287533
Nonane	0.000413848	0.0216876	0.00248248	0.0290154	0.0593489
n-Decane	4.35734E-05	0.00234103	0.000261377	0.00304002	0.0191194
n-Hexane	0.0316217	1.52725	0.189684	2.95319	0.280853
Benzene	0.0165431	0.788506	0.0992346	11.9728	0.205607
Toluene	0.00691094	0.338851	0.0414555	2.32472	0.148991
Ethylbenzene	0.000409839	0.0207919	0.00245844	0.0874595	0.0210567
o-Xylene	0.000541685	0.027521	0.00324932	0.11713	0.0337637
MDEA	4.85042E-06	0.000205516	2.90954E-05	0.00728015	3.17579E-05
Piperazine	6.6712E-09	4.53926E-07	4.00175E-08	9.16757E-05	0.0571972

Stream Properties

Property	Units	TKB P2	TKFlash P2	TWK P2	VRU to Inlet P2	Water Flash Liquids
Temperature	°F	73.4479	73.4479	73.4479	200	56.9696
Pressure	psia	13.26	13.26	13.26	63.25	84.6959
Molecular Weight	lb/lbmol	62.2973	55.3696	62.2973	20.8727	19.2003
Mass Flow	lb/h	0.866125	68.2973	5.19548	649.527	104.848
Std Vapor Volumetric Flow	MMSCFD	0.000126624	0.0112341	0.000759559	0.283415	0.0497347
Std Liquid Volumetric Flow	sgpm	0.00275495	0.235362	0.0165257	3.33917	0.222001
Net Ideal Gas Heating Value	Btu/ft^3	2992.63	2748.72	2992.63	989.613	84.1033
Gross Ideal Gas Heating Value	Btu/ft^3	3238.05	2978.73	3238.05	1096.5	139.864

Remarks

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	Emission Streams	

Connections

	1	5	12	13	14
From Block	Condensate to Storage	VLVE-100	MIX-100	V-12900 Tank VRU Suction Scrubber	C-12900 Tank VRU
To Block	MIX-105	--	RCYL-1	C-12900 Tank VRU	AC-12900 Tank VRU Aftercooler

Stream Composition

Mole Fraction	1 %	5 %	12 %	13 %	14 %
H2S	3.58787E-09	0	0.126354	0.126772	0.126772
H2O	6.2267E-14	0	13.1536	13.0673	13.0673
TEG	6.20353E-08	0	1.77575E-10	1.32252E-12	1.32252E-12
N2	0	1.89607	1.44285	1.44411	1.44411
CO2	2.56416E-12	0.0671419	0.15554	0.155938	0.155938
Methane	1.57989E-14	95.832	73.4711	73.5356	73.5356
Ethane	5.60453E-09	1.81344	2.88099	2.88418	2.88418
Propane	3.83367E-05	0.0681546	2.70395	2.70872	2.70872
Isobutane	0.00811679	0.00405079	0.593543	0.594881	0.594881
n-Butane	0.24754	0.0140765	2.28617	2.29088	2.29088
Isopentane	12.9421	0.00860793	0.962632	0.964596	0.964596
n-Pentane	22.3064	0.0130638	0.909665	0.911455	0.911455
i-Hexane	21.1065	0.283353	0.548092	0.549046	0.549046
Heptane	12.6695	0	0.0630112	0.0631767	0.0631767
Octane	7.43156	0	0.0123865	0.0124215	0.0124215
Nonane	1.37764	0	0.000724851	0.000727002	0.000727002
n-Decane	0.401146	0	6.84538E-05	6.86609E-05	6.86609E-05
n-Hexane	8.66536	0	0.109869	0.110126	0.110126
Benzene	6.70077	0	0.492037	0.492561	0.492561
Toluene	4.62185	0	0.0809752	0.0810797	0.0810797
Ethylbenzene	0.583242	0	0.00264323	0.00264733	0.00264733
o-Xylene	0.93743	0	0.00353996	0.00354542	0.00354542
MDEA	0.000723549	0	0.000196164	0.000196328	0.000196328
Piperazine	3.09472E-07	0	1.02247E-05	3.42022E-06	3.42022E-06

Mass Fraction	1 %	5 %	12 %	13 %	14 %
H2S	1.42406E-09	0	0.206375	0.206993	0.206993
H2O	1.30641E-14	0	11.3564	11.2784	11.2784
TEG	1.08495E-07	0	1.278E-09	9.51513E-12	9.51513E-12
N2	0	3.16537	1.93706	1.93815	1.93815
CO2	1.31423E-12	0.176093	0.328053	0.328791	0.328791
Methane	2.95174E-15	91.6187	56.4864	56.5183	56.5183
Ethane	1.96264E-09	3.24956	4.15162	4.15491	4.15491
Propane	1.96875E-05	0.179099	5.71414	5.72244	5.72244
Isobutane	0.00549423	0.0140309	1.6533	1.65651	1.65651
n-Butane	0.167559	0.0487573	6.36805	6.3792	6.3792
Isopentane	10.8747	0.037011	3.32848	3.33423	3.33423
n-Pentane	18.743	0.0561696	3.14533	3.15054	3.15054
i-Hexane	21.1826	1.45517	2.26356	2.2668	2.2668
Heptane	14.7849	0	0.302587	0.303287	0.303287
Octane	9.88633	0	0.0678077	0.0679783	0.0679783
Nonane	2.05774	0	0.00445533	0.00446716	0.00446716
n-Decane	0.66471	0	0.00046677	0.000468036	0.000468036
n-Hexane	8.69662	0	0.453749	0.454667	0.454667
Benzene	6.09568	0	1.84192	1.84331	1.84331
Toluene	4.95949	0	0.35756	0.35791	0.35791
Ethylbenzene	0.721126	0	0.0134485	0.0134651	0.0134651
o-Xylene	1.15905	0	0.0180109	0.0180331	0.0180331
MDEA	0.00100412	0	0.00112025	0.00112084	0.00112084

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC
Location:	Titan Treater #2
Flowsheet:	Emission Streams
Job:	

Mass Fraction	1 %	5 %	12 %	13 %	14 %
Piperazine	3.10445E-07	0	4.22076E-05	1.41142E-05	1.41142E-05

Mass Flow	1 lb/h	5 lb/h	12 lb/h	13 lb/h	14 lb/h
H2S	2.90764E-07	0	1.46853	1.47183	1.47183
H2O	2.66743E-12	0	80.8108	80.1949	80.1949
TEG	2.21526E-05	0	9.09407E-09	6.76574E-11	6.76574E-11
N2	0	2.85731	13.7838	13.7812	13.7812
CO2	2.6834E-10	0.158956	2.33438	2.33787	2.33787
Methane	6.02686E-13	82.7023	401.949	401.874	401.874
Ethane	4.00731E-07	2.93331	29.5424	29.5435	29.5435
Propane	0.00401979	0.161669	40.661	40.6894	40.6894
Isobutane	1.12181	0.0126654	11.7646	11.7786	11.7786
n-Butane	34.2122	0.0440122	45.3142	45.3593	45.3593
Isopentane	2220.39	0.033409	23.685	23.708	23.708
n-Pentane	3826.95	0.0507031	22.3817	22.4019	22.4019
i-Hexane	4325.07	1.31355	16.1072	16.1181	16.1181
Heptane	3018.77	0	2.15317	2.15652	2.15652
Octane	2018.59	0	0.48251	0.48336	0.48336
Nonane	420.15	0	0.0317035	0.0317637	0.0317637
n-Decane	135.72	0	0.00332147	0.00332797	0.00332797
n-Hexane	1775.68	0	3.22881	3.23291	3.23291
Benzene	1244.62	0	13.1068	13.1068	13.1068
Toluene	1012.63	0	2.54435	2.54492	2.54492
Ethylbenzene	147.239	0	0.0956975	0.0957437	0.0957437
o-Xylene	236.654	0	0.128163	0.128224	0.128224
MDEA	0.205022	0	0.00797152	0.00796972	0.00796972
Piperazine	6.33867E-05	0	0.000300343	0.000100359	0.000100359

Stream Properties

Property	Units	1	5	12	13	14
Temperature	°F	120.167	71.8875	120.691	120.688	428.347
Pressure	psia	18.25	13.75 *	13.26	13.26	65.25
Molecular Weight	lb/lbmol	85.8656	16.7802	20.8662	20.8727	20.8727
Mass Flow	lb/h	20418	90.2679	711.586	711.05	711.05
Std Vapor Volumetric Flow	MMSCFD	2.1657	0.0489938	0.310591	0.31026	0.31026
Std Liquid Volumetric Flow	sgpm	59.8589	0.580367	3.65666	3.65545	3.65545
Net Ideal Gas Heating Value	Btu/ft^3	4331.36	916.235	988.453	989.613	989.613
Gross Ideal Gas Heating Value	Btu/ft^3	4660.33	1016.62	1095.27	1096.5	1096.5

Remarks

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	Emission Streams	

Connections

	15	16	17	112	
From Block	AC-12900 Tank VRU Aftercooler	V-12900 Tank VRU Suction Scrubber	SPLT-100	RCYL-1	
To Block	SPLT-100	MIX-101	BTEX Motive Gas	V-12900 Tank VRU Suction Scrubber	

Stream Composition

Mole Fraction	15 %	16 %	17 %	112 %	
H2S	0.126772	0.000110988	0.126772	0.126649	
H2O	13.0673	99.9907	13.0673	13.1522	
TEG	1.32252E-12	1.80403E-07	1.32252E-12	1.77586E-10	
N2	1.44411	1.23158E-05	1.44411	1.4427	
CO2	0.155938	4.44487E-05	0.155938	0.155786	
Methane	73.5356	0.00127215	73.5356	73.4637	
Ethane	2.88418	6.23484E-05	2.88418	2.88136	
Propane	2.70872	4.05333E-05	2.70872	2.70608	
Isobutane	0.594881	4.93406E-06	0.594881	0.5943	
n-Butane	2.29088	3.19588E-05	2.29088	2.28865	
Isopentane	0.964596	8.05518E-06	0.964596	0.963653	
n-Pentane	0.911455	4.3476E-06	0.911455	0.910564	
i-Hexane	0.549046	1.11745E-06	0.549046	0.54851	
Heptane	0.0631767	1.18913E-07	0.0631767	0.063115	
Octane	0.0124215	1.16836E-08	0.0124215	0.0124094	
Nonane	0.000727002	4.08578E-10	0.000727002	0.000726292	
n-Decane	6.86609E-05	1.31838E-11	6.86609E-05	6.85938E-05	
n-Hexane	0.110126	3.26953E-07	0.110126	0.110018	
Benzene	0.492561	0.000641081	0.492561	0.49208	
Toluene	0.0810797	8.19542E-05	0.0810797	0.0810006	
Ethylbenzene	0.00264733	2.07167E-06	0.00264733	0.00264474	
o-Xylene	0.00354542	4.22322E-06	0.00354542	0.00354196	
MDEA	0.000196328	2.32576E-05	0.000196328	0.000196159	
Piperazine	3.42022E-06	0.00695894	3.42022E-06	1.02162E-05	

Mass Fraction	15 %	16 %	17 %	112 %	
H2S	0.206993	0.000209904	0.206993	0.206819	
H2O	11.2784	99.9615	11.2784	11.3532	
TEG	9.51513E-12	1.50338E-06	9.51513E-12	1.27785E-09	
N2	1.93815	1.91452E-05	1.93815	1.93652	
CO2	0.328791	0.000108552	0.328791	0.328514	
Methane	56.5183	0.00113251	56.5183	56.4707	
Ethane	4.15491	0.000104034	4.15491	4.15141	
Propane	5.72244	9.91835E-05	5.72244	5.71761	
Isobutane	1.65651	1.5914E-05	1.65651	1.65511	
n-Butane	6.3792	0.000103078	6.3792	6.37382	
Isopentane	3.33423	3.22505E-05	3.33423	3.33141	
n-Pentane	3.15054	1.74065E-05	3.15054	3.14788	
i-Hexane	2.2668	5.3437E-06	2.2668	2.26489	
Heptane	0.303287	6.6121E-07	0.303287	0.303031	
Octane	0.0679783	7.40597E-08	0.0679783	0.067921	
Nonane	0.00446716	2.90792E-09	0.00446716	0.00446339	
n-Decane	0.000468036	1.04093E-10	0.000468036	0.000467641	
n-Hexane	0.454667	1.56351E-06	0.454667	0.454284	
Benzene	1.84331	0.00277883	1.84331	1.84175	
Toluene	0.35791	0.000419029	0.35791	0.357609	
Ethylbenzene	0.0134651	1.22049E-05	0.0134651	0.0134538	
o-Xylene	0.0180331	2.48804E-05	0.0180331	0.0180179	
MDEA	0.00112084	0.000153793	0.00112084	0.00112002	

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC
Location:	Titan Treater #2
Flowsheet:	Emission Streams
Job:	

Mass Fraction	15 %	16 %	17 %	112 %
Piperazine	1.41142E-05	0.0332627	1.41142E-05	4.21647E-05

Mass Flow	15 lb/h	16 lb/h	17 lb/h	112 lb/h
H2S	1.47183	1.26024E-06	0.127349	1.47183
H2O	80.1949	0.60016	6.93882	80.7951
TEG	6.76574E-11	9.02615E-09	5.85401E-12	9.09381E-09
N2	13.7812	1.14946E-07	1.19241	13.7812
CO2	2.33787	6.51736E-07	0.202283	2.33787
Methane	401.874	6.79949E-06	34.7719	401.874
Ethane	29.5435	6.24613E-07	2.55624	29.5435
Propane	40.6894	5.95489E-07	3.52063	40.6894
Isobutane	11.7786	9.5546E-08	1.01914	11.7786
n-Butane	45.3593	6.1887E-07	3.92469	45.3593
Isopentane	23.708	1.93629E-07	2.05132	23.708
n-Pentane	22.4019	1.04507E-07	1.93831	22.4019
i-Hexane	16.1181	3.20831E-08	1.39461	16.1181
Heptane	2.15652	3.96985E-09	0.186592	2.15652
Octane	0.48336	4.44648E-10	0.0418224	0.48336
Nonane	0.0317637	1.74589E-11	0.00274834	0.0317637
n-Decane	0.00332797	6.24963E-13	0.000287951	0.00332797
n-Hexane	3.23291	9.38717E-09	0.279726	3.23291
Benzene	13.1068	1.66839E-05	1.13406	13.1069
Toluene	2.54492	2.51581E-06	0.220198	2.54492
Ethylbenzene	0.0957437	7.32772E-08	0.00828416	0.0957437
o-Xylene	0.128224	1.4938E-07	0.0110945	0.128224
MDEA	0.00796972	9.23357E-07	0.000689575	0.00797064
Piperazine	0.000100359	0.000199706	8.68352E-06	0.000300066

Stream Properties

Property	Units	15	16	17	112
Temperature	°F	200 *	120.688	200	120.688
Pressure	psia	63.25 *	13.26	63.25	13.26
Molecular Weight	lb/lbmol	20.8727	18.0205	20.8727	20.8699
Mass Flow	lb/h	711.05	0.600391	61.5232	711.651
Std Vapor Volumetric Flow	MMSCFD	0.31026	0.000303439	0.0268451	0.310564
Std Liquid Volumetric Flow	sgpm	3.65545	0.00120042	0.316286	3.65665
Net Ideal Gas Heating Value	Btu/ft^3	989.613	0.264894	989.613	988.646
Gross Ideal Gas Heating Value	Btu/ft^3	1096.5	50.5906	1096.5	1095.48

Remarks

Blocks
AP-42 Condensate Tanks
Tank Losses

Client Name:	Northwind Midstream Partners, LLC	Job:	
Location:	Titan Treater #2	Modified: 2:05 PM, 11/13/2024	
Flowsheet:	Emission Streams	Status: Solved 2:00 PM, 11/19/2024	

Connections

Stream	Connection Type	Other Block	Stream	Connection Type	Other Block
Condensate Tank Inlet P2	Inlet	MIX-105	CondFlash P2	Flashing Losses Stream	MIX-102
CondW P2	Working Losses Stream	MIX-102	CondB P2	Standing Losses Stream	MIX-102
Condensate Load Comp P2	Loading Losses Stream		Condensate Offsite P2	Residual Liquid Stream	

Working and Standing Properties

	Tank Geometry	Vertical Cylinder		Roof Type	Cone
*	Shell Length	30 ft		Slope of Coned Roof	0.0625
*	Shell Diameter	15.5 ft		Breather Vent Pressure	0.03 psi
*	Number of Storage Tanks	4		Breather Vacuum Pressure	-0.03 psi
	Maximum Fraction Fill of Tank	90 %	*	Location	Midland, TX
	Average Fraction Fill of Tank	50 %		Time Frame	Year
	Minimum Fraction Fill of Tank	10 %		Known Liquid Bulk Temperature?	False
*	Material Category	Light Organics		Liquid Bulk Temperature	65.3235 °F
	Insulation	Uninsulated	*	Use AP 42 Raoult's Vapor Pressure?	True
	Bolted or Riveted Construction?	False		Flashing Temperature	73.4549 °F
	Vapor Balanced Tank?	False		Average Daily Maximum Ambient Temperature	76.7 °F
	Known Sum of Increases in Liquid Level?	False		Average Daily Minimum Ambient Temperature	51.4 °F
	Sum of Increases in Liquid Level	11133.8 ft/yr		Atmospheric Pressure at Tank Location	13.26 psia
	Shell Color	White		Daily Solar Insolation	1698 Btu/(day*ft^2)
	Shell Paint Condition	Average		Average Wind Speed	11 mph
	Roof Color	White	*	Include Short Term Emissions	True
	Roof Paint Condition	Average			

Composition Subset Properties

Component Subset	VOCs	Species in Results	Selected Species
Atomic Basis	False	Fraction Denominator	Selected Species

Tabulated Composition Subset Properties

Index	Selected Components			
H2S	False			
H2O	False			
TEG	True			
N2	False			
CO2	False			
Methane	False			
Ethane	False			
Propane	True			
Isobutane	True			
n-Butane	True			
Isopentane	True			
n-Pentane	True			
i-Hexane	True			
Heptane	True			
Octane	True			
Nonane	True			
n-Decane	True			
n-Hexane	True			
Benzene	True			

Blocks
AP-42 Condensate Tanks
Tank Losses

Client Name:	Northwind Midstream Partners, LLC	Job:	
Location:	Titan Treater #2	Modified: 2:05 PM, 11/13/2024	
Flowsheet:	Emission Streams	Status: Solved 2:00 PM, 11/19/2024	

Tabulated Composition Subset Properties

Index	Selected Components			
Toluene	True			
Ethylbenzene	True			
o-Xylene	True			
MDEA	True			
Piperazine	True			

Details Properties

Vapor Space Volume	2860.84	ft^3	Roof Outage	0.161458	ft
Vapor Density	0.0576415	lb/ft^3	Tank Roof Height	0.484375	ft
Vapor Space Expansion Factor	0.198405	1/day	Tank Shell Radius	7.75	ft
Vented Vapor Saturation Factor	0.224018		Vapor Molecular Weight	75.6331	lb/lbmol
Vapor Space Outage	15.1615	ft	Average Vapor Temperature	527.068	°R
Average Daily Vapor Temperature Range	28.3774	°R	Average Daily Ambient Temperature	523.72	°R
Average Daily Vapor Pressure Range	1.35279	psi	Net Working Loss Throughput	2.10086E+06	ft^3/yr
Breather Vent Pressure Setting Range	0.06	psi	Working Loss Turnover (Saturation) Factor	0.231335	
Vapor Pressure at Average Daily Liquid Surface Temperature	4.31075	psia	Number of Turnovers per Year	463.908	
Average Daily Liquid Surface Temperature	526.031	°R	Annual Net Throughput	1.49687E+06	bbl/yr
Average Daily Ambient Temperature Range	25.3	°R	Maximum Liquid Height	27	ft
Tank Roof Surface Solar Absorptance	0.25		Minimum Liquid Height	3	ft
Tank Shell Surface Solar Absorptance	0.25		Working Loss Product Factor	1	
Vapor Pressure at Maximum Liquid Surface Temperature	5.02986	psia	Vent Setting Correction Factor	1	
Vapor Pressure at Minimum Liquid Surface Temperature	3.67706	psia	Saturation Factor	0.6	
Maximum Liquid Surface Temperature	533.125	°R	Vapor Pressure of Liquid Loaded	4.21162	psia
Minimum Liquid Surface Temperature	518.936	°R	Annual Net Throughput Per Tank	374217	bbl/yr
Liquid Height	15	ft			

Loading Properties

Cargo Carrier	Tank Truck or Rail Tank Car	* Overall Reduction Efficiency	0 %
* Land Based Mode of Operation	Submerged Loading: Dedicated Normal Service		

Results Properties

Flashing Losses	0	ton/yr	Standing Losses per Tank	1.3376	ton/yr
Working Losses	56.0276	ton/yr	Flashing Losses per Tank	0	ton/yr
Standing Losses	5.3504	ton/yr	Working and Standing Losses	61.378	ton/yr
Loading Losses	142.84	ton/yr	Working and Standing Losses per Tank	15.3445	ton/yr
Working Losses per Tank	14.0069	ton/yr	Loading Losses per Tank	35.7099	ton/yr

Blocks
AP-42 Condensate Tanks
Tank Losses

Client Name:	Northwind Midstream Partners, LLC	Job:	
Location:	Titan Treater #2	Modified: 2:05 PM, 11/13/2024	
Flowsheet:	Emission Streams	Status: Solved 2:00 PM, 11/19/2024	

Tabulated Results Properties

Index	Flashing Losses Mass Flows ton/yr	Working Losses Mass Flows ton/yr	Standing Losses Mass Flows ton/yr	Loading Losses Mass Flows ton/yr
TEG	0	8.43834E-14	8.05826E-15	1.71464E-10
Propane	0	0.000353491	3.37569E-05	0.000827937
Isobutane	0	0.0345655	0.00330086	0.079522
n-Butane	0	0.711591	0.067954	1.63545
Isopentane	0	17.2653	1.64876	42.9896
n-Pentane	0	21.8882	2.09023	54.8964
i-Hexane	0	9.96483	0.951599	25.9258
Heptane	0	1.42438	0.136022	3.36776
Octane	0	0.25717	0.0245586	0.667331
Nonane	0	0.0141981	0.00135586	0.0425547
n-Decane	0	0.0012807	0.000122302	0.00434408
n-Hexane	0	2.88932	0.275918	7.17329
Benzene	0	1.25311	0.119666	4.88045
Toluene	0	0.294332	0.0281075	1.06763
Ethylbenzene	0	0.0137321	0.00131136	0.0462637
o-Xylene	0	0.0152494	0.00145625	0.0624103
MDEA	0	1.06135E-08	1.01354E-09	9.40219E-05
Piperazine	0	1.49242E-09	1.4252E-10	1.45861E-06

Index	Working and Standing Losses Mass Flows ton/yr			
TEG	9.24416E-14			
Propane	0.000387247			
Isobutane	0.0378664			
n-Butane	0.779545			
Isopentane	18.914			
n-Pentane	23.9785			
i-Hexane	10.9164			
Heptane	1.5604			
Octane	0.281729			
Nonane	0.015554			
n-Decane	0.00140301			
n-Hexane	3.16524			
Benzene	1.37277			
Toluene	0.32244			
Ethylbenzene	0.0150434			
o-Xylene	0.0167057			
MDEA	1.1627E-08			
Piperazine	1.63494E-09			

Short Term Properties

*	Maximum Battery Filling Rate	190 bbl/hr		Worst-Case Flashing Losses per Tank	0 lb/h
	Short-Term Number of Storage Tanks	4		Short-Term Working Losses per Tank	26.6505 lb/h
	Worst-Case Liquid Surface Temperature	95 °F		Short-Term Loading Losses per Tank	16.0008 lb/h
*	Maximum Loading Rate	190 bbl/hr		Short-Term Vapor Molecular Weight	76.0334 lb/lbmol
	Worst-Case Flashing Losses	0 lb/h		Vapor Pressure at Worst-Case Temperature	7.82327 psia
	Short-Term Working Losses	106.602 lb/h	*	Short-Term Overall Reduction Efficiency	0 %
	Short-Term Loading Losses	64.0031 lb/h			

Blocks
AP-42 Condensate Tanks
Tank Losses

Client Name:	Northwind Midstream Partners, LLC	Job:	
Location:	Titan Treater #2	Modified: 2:05 PM, 11/13/2024	
Flowsheet:	Emission Streams	Status: Solved 2:00 PM, 11/19/2024	

Tabulated Short Term Properties

Index	Worst-Case Flashing Losses Mass Flows lb/h	Short-Term Working Losses Mass Flows lb/h	Short-Term Loading Losses Mass Flows lb/h	
TEG	0	5.33719E-13	1.47062E-10	
Propane	0	0.000547221	0.000272495	
Isobutane	0	0.0569581	0.0297713	
n-Butane	0	1.19746	0.637432	
Isopentane	0	31.2926	18.2225	
n-Pentane	0	40.8473	24.0756	
i-Hexane	0	19.8538	12.1577	
Heptane	0	3.2454	1.86444	
Octane	0	0.663103	0.411401	
Nonane	0	0.0370567	0.0292923	
n-Decane	0	0.00293867	0.00330206	
n-Hexane	0	5.94584	3.54154	
Benzene	0	2.69306	2.37554	
Toluene	0	0.690268	0.587165	
Ethylbenzene	0	0.0354478	0.0283883	
o-Xylene	0	0.0404394	0.0387024	
MDEA	0	5.87187E-08	4.63861E-05	
Piperazine	0	4.85233E-09	5.01512E-07	

Remarks

Blocks
AP-42 Slop Tanks
Tank Losses

Client Name:	Northwind Midstream Partners, LLC	Job:	
Location:	Titan Treater #2	Modified: 2:05 PM, 11/13/2024	
Flowsheet:	Emission Streams	Status: Solved 5:40 PM, 11/20/2024	

Connections

Stream	Connection Type	Other Block	Stream	Connection Type	Other Block
Slop Tank Inlet P2	Inlet	MIX-101	TKFlash P2	Flashing Losses Stream	MIX-104
TWK P2	Working Losses Stream	MIX-103	TKB P2	Standing Losses Stream	MIX-103
Slop Load Composition P2	Loading Losses Stream		Slop Offsite P2	Residual Liquid Stream	

Working and Standing Properties

	Tank Geometry	Vertical Cylinder		Roof Type	Cone
*	Shell Length	20 ft		Slope of Coned Roof	0.0625
*	Shell Diameter	12 ft		Breather Vent Pressure	0.03 psi
*	Number of Storage Tanks	2		Breather Vacuum Pressure	-0.03 psi
	Maximum Fraction Fill of Tank	90 %	*	Location	Midland, TX
	Average Fraction Fill of Tank	50 %		Time Frame	Year
	Minimum Fraction Fill of Tank	10 %		Known Liquid Bulk Temperature?	False
*	Material Category	Heavy Crude		Liquid Bulk Temperature	65.3235 °F
	Insulation	Uninsulated		Use AP 42 Raoult's Vapor Pressure?	False
	Bolted or Riveted Construction?	False		Flashing Temperature	73.4479 °F
	Vapor Balanced Tank?	False		Average Daily Maximum Ambient Temperature	76.7 °F
	Known Sum of Increases in Liquid Level?	False		Average Daily Minimum Ambient Temperature	51.4 °F
	Sum of Increases in Liquid Level	4045.16 ft/yr		Atmospheric Pressure at Tank Location	13.26 psia
	Shell Color	White		Daily Solar Insolation	1698 Btu/(day*ft^2)
	Shell Paint Condition	Average		Average Wind Speed	11 mph
	Roof Color	White	*	Include Short Term Emissions	True
	Roof Paint Condition	Average			

Composition Subset Properties

Component Subset	VOCs	Species in Results	Selected Species
Atomic Basis	False	Fraction Denominator	Selected Species

Tabulated Composition Subset Properties

Index	Selected Components			
H2S	False			
H2O	False			
TEG	True			
N2	False			
CO2	False			
Methane	False			
Ethane	False			
Propane	True			
Isobutane	True			
n-Butane	True			
Isopentane	True			
n-Pentane	True			
i-Hexane	True			
Heptane	True			
Octane	True			
Nonane	True			
n-Decane	True			
n-Hexane	True			
Benzene	True			

Blocks
AP-42 Slop Tanks
Tank Losses

Client Name:	Northwind Midstream Partners, LLC	Job:	
Location:	Titan Treater #2	Modified: 2:05 PM, 11/13/2024	
Flowsheet:	Emission Streams	Status: Solved 5:40 PM, 11/20/2024	

Tabulated Composition Subset Properties

Index	Selected Components			
Toluene	True			
Ethylbenzene	True			
o-Xylene	True			
MDEA	True			
Piperazine	True			

Details Properties

Vapor Space Volume	1145.11	ft^3	Roof Outage	0.125	ft
Vapor Density	0.114354	lb/ft^3	Tank Roof Height	0.375	ft
Vapor Space Expansion Factor	1	1/day	Tank Shell Radius	6	ft
Vented Vapor Saturation Factor	0.136856		Vapor Molecular Weight	55.0434	lb/lbmol
Vapor Space Outage	10.125	ft	Average Vapor Temperature	527.157	°R
Average Daily Vapor Temperature Range	28.1714	°R	Average Daily Ambient Temperature	523.72	°R
Average Daily Vapor Pressure Range	2.87602	psi	Net Working Loss Throughput	457497	ft^3/yr
Breather Vent Pressure Setting Range	0.06	psi	Working Loss Turnover (Saturation) Factor	1	
Vapor Pressure at Average Daily Liquid Surface Temperature	11.753	psia	Number of Turnovers per Year	252.823	
Average Daily Liquid Surface Temperature	526.075	°R	Annual Net Throughput	162984	bbl/yr
Average Daily Ambient Temperature Range	25.3	°R	Maximum Liquid Height	18	ft
Tank Roof Surface Solar Absorptance	0.25		Minimum Liquid Height	2	ft
Tank Shell Surface Solar Absorptance	0.25		Working Loss Product Factor	0.75	
Vapor Pressure at Maximum Liquid Surface Temperature	13.26	psia	Vent Setting Correction Factor	1	
Vapor Pressure at Minimum Liquid Surface Temperature	10.384	psia	Saturation Factor	0.6	
Maximum Liquid Surface Temperature	533.118	°R	Vapor Pressure of Liquid Loaded	2.14506	psia
Minimum Liquid Surface Temperature	519.032	°R	Annual Net Throughput Per Tank	81492.1	bbl/yr
Liquid Height	10	ft			

Loading Properties

Cargo Carrier	Tank Truck or Rail Tank Car		* Overall Reduction Efficiency	0	%
* Land Based Mode of Operation	Submerged Loading: Dedicated Normal Service				

Results Properties

Flashing Losses	274.009	ton/yr	Standing Losses per Tank	1.74583	ton/yr
Working Losses	20.9448	ton/yr	Flashing Losses per Tank	137.004	ton/yr
Standing Losses	3.49166	ton/yr	Working and Standing Losses	24.4365	ton/yr
Loading Losses	6.65227	ton/yr	Working and Standing Losses per Tank	12.2182	ton/yr
Working Losses per Tank	10.4724	ton/yr	Loading Losses per Tank	3.32613	ton/yr

Blocks
AP-42 Slop Tanks
Tank Losses

Client Name:	Northwind Midstream Partners, LLC	Job:	
Location:	Titan Treater #2	Modified: 2:05 PM, 11/13/2024	
Flowsheet:	Emission Streams	Status: Solved 5:40 PM, 11/20/2024	

Tabulated Results Properties

Index	Flashing Losses Mass Flows ton/yr	Working Losses Mass Flows ton/yr	Standing Losses Mass Flows ton/yr	Loading Losses Mass Flows ton/yr
TEG	6.18328E-11	4.67251E-12	7.78942E-13	3.17074E-12
Propane	56.553	1.06282	0.17718	0
Isobutane	24.7848	0.986819	0.16451	0
n-Butane	80.6084	4.65125	0.775398	0
Isopentane	39.0524	5.03859	0.83997	0.227805
n-Pentane	34.6158	4.43099	0.738679	1.62861
i-Hexane	19.741	2.48361	0.414035	2.31143
Heptane	5.36267	0.648252	0.108068	0.804276
Octane	1.3456	0.158317	0.0263925	0.205163
Nonane	0.0949918	0.0108733	0.00181265	0.0143162
n-Decane	0.0102537	0.00114483	0.000190851	0.00141496
n-Hexane	6.68935	0.830814	0.138503	0.876387
Benzene	3.45366	0.434647	0.0724589	0.36321
Toluene	1.48417	0.181575	0.0302699	0.191397
Ethylbenzene	0.0910685	0.010768	0.0017951	0.0121559
o-Xylene	0.120542	0.014232	0.00237258	0.0159931
MDEA	0.000900159	0.000127438	2.12448E-05	0.000104469
Piperazine	1.9882E-06	1.75276E-07	2.92199E-08	1.26692E-07

Index	Working and Standing Losses Mass Flows ton/yr			
TEG	5.45145E-12			
Propane	1.24			
Isobutane	1.15133			
n-Butane	5.42665			
Isopentane	5.87856			
n-Pentane	5.16967			
i-Hexane	2.89764			
Heptane	0.756321			
Octane	0.184709			
Nonane	0.0126859			
n-Decane	0.00133568			
n-Hexane	0.969317			
Benzene	0.507106			
Toluene	0.211845			
Ethylbenzene	0.012563			
o-Xylene	0.0166046			
MDEA	0.000148683			
Piperazine	2.04496E-07			

Short Term Properties

*	Maximum Battery Filling Rate	190 bbl/hr	Worst-Case Flashing Losses per Tank	362.155	lb/h
	Short-Term Number of Storage Tanks	2	Short-Term Working Losses per Tank	15.9571	lb/h
	Worst-Case Liquid Surface Temperature	95 °F	Short-Term Loading Losses per Tank	4.36051	lb/h
*	Maximum Loading Rate	190 bbl/hr	Short-Term Vapor Molecular Weight	56.1714	lb/lbmol
	Worst-Case Flashing Losses	724.309 lb/h	Vapor Pressure at Worst-Case Temperature	13.26	psia
	Short-Term Working Losses	31.9142 lb/h	* Short-Term Overall Reduction Efficiency	0	%
	Short-Term Loading Losses	8.72102 lb/h			

Blocks
AP-42 Slop Tanks
Tank Losses

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	Modified: 2:05 PM, 11/13/2024
Flowsheet:	Emission Streams	Status: Solved 5:40 PM, 11/20/2024

Tabulated Short Term Properties

Index	Worst-Case Flashing Losses Mass Flows lb/h	Short-Term Working Losses Mass Flows lb/h	Short-Term Loading Losses Mass Flows lb/h	
TEG	1.07839E-09	1.81659E-10	1.01517E-10	
Propane	131.306	1.09088	0	
Isobutane	58.7133	0.703318	0	
n-Butane	193.733	3.36247	0	
Isopentane	100.016	3.37624	0	
n-Pentane	91.6084	3.81831	0	
i-Hexane	61.2763	5.66873	0	
Heptane	29.2501	4.9273	3.91275	
Octane	12.0253	2.02572	2.37014	
Nonane	1.20376	0.202779	0.261902	
n-Decane	0.153924	0.0259292	0.0329384	
n-Hexane	23.0554	3.01208	0	
Benzene	12.491	2.10416	1.02486	
Toluene	7.70384	1.29775	0.846875	
Ethylbenzene	0.746294	0.125716	0.115594	
o-Xylene	1.02322	0.172367	0.15569	
MDEA	0.00277754	0.000467889	0.000271384	
Piperazine	2.29375E-05	3.86392E-06	2.25761E-06	

Warnings

ProMax:ProMax!Project!Flowsheets!Emission Streams!Blocks!AP-42 Slop Tanks

Warning: Vapor adjusted to ensure mass balance.

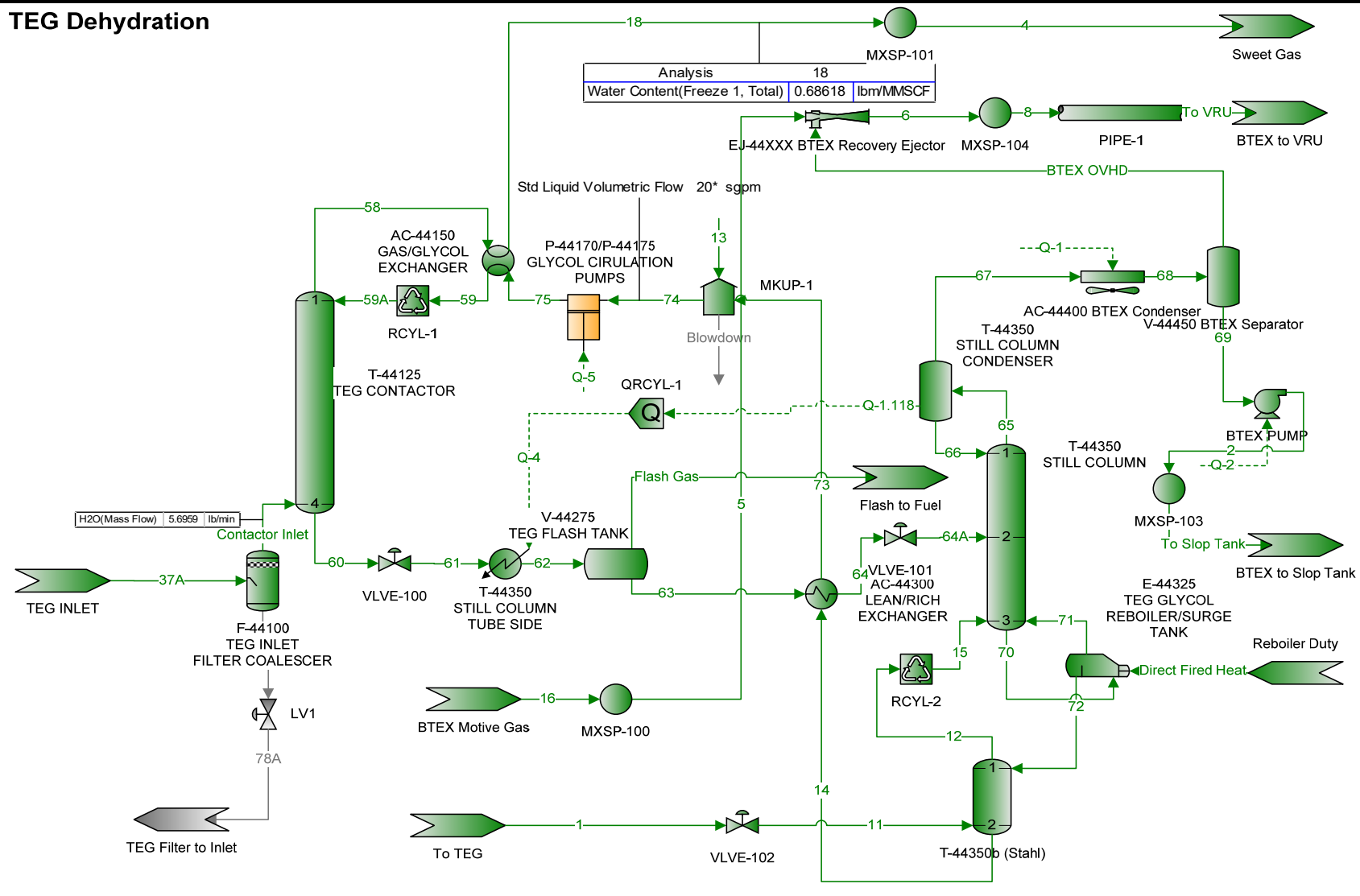
Warning: Short Term vapor adjusted to ensure mass balance.

Remarks

TEG Dehydration
Plant Schematic

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	TEG Dehydration	

TEG Dehydration



* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:	
Location:	Titan Treater #2		
Flowsheet:	TEG Dehydration		

Connections

	Blowdown	BTEX OVHD	Contactor Inlet	Flash Gas	MultiplierBypass-1
From Block	MKUP-1	V-44450 BTEX Separator	F-44100 TEG INLET FILTER COALESCER	V-44275 TEG FLASH TANK	MultiplierMixer-I-1
To Block	--	EJ-44XXX BTEX Recovery Ejector	T-44125 TEG CONTACTOR	Flash to Fuel	MultiplierMixer-O-1

Stream Composition

Mole Fraction	Blowdown %	BTEX OVHD %	Contactor Inlet %	Flash Gas %	MultiplierBypass-1 %
H2S	6.81567E-12	0.000662282	0.000115144	0.000901314	
H2O	0.991197	13.6902	0.188036	0.512452	
TEG	98.8884	2.03841E-10	0	0.000289097	
N2	0.000503984	1.51635	1.99464	0.4369	
CO2	0.000131343	0.0536238	0.000897977	0.00389202	
Methane	0.0567054	77.1789	71.3146	50.0383	
Ethane	0.00223944	2.75091	14.6773	23.4083	
Propane	0.000128281	1.83219	7.95449	16.3771	
Isobutane	9.75161E-06	0.279528	0.921424	1.86477	
n-Butane	4.07928E-05	1.25206	2.24825	5.63556	
Isopentane	3.46307E-05	0.330021	0.394089	0.926087	
n-Pentane	5.72853E-05	0.275227	0.244705	0.632299	
i-Hexane	0.00242272	0.276087	0.040725	0.0964679	
Heptane	4.65544E-10	0.00718173	0.00221973	0.00482892	
Octane	2.02674E-10	0.000796944	0.000176159	0.000313699	
Nonane	2.75089E-11	2.15725E-05	3.43198E-06	4.73535E-06	
n-Decane	1.11461E-11	1.59385E-06	1.86125E-07	1.98215E-07	
n-Hexane	1.43303E-09	0.0187099	0.00924467	0.0223207	
Benzene	1.06482E-05	0.464556	0.00814271	0.0359595	
Toluene	8.42179E-06	0.0682317	0.000814815	0.00282072	
Ethylbenzene	1.06606E-06	0.00191695	1.72352E-05	4.69783E-05	
o-Xylene	3.41328E-06	0.00260417	1.83323E-05	4.51417E-05	
MDEA	0.00529583	0.000199401	3.93894E-06	3.27543E-07	
Piperazine	0.0527874	1.14048E-05	0.000122632	0.000326913	

Mass Fraction	Blowdown %	BTEX OVHD %	Contactor Inlet %	Flash Gas %	MultiplierBypass-1 %
H2S	1.56161E-12	0.00119101	0.00017589	0.0010921	
H2O	0.120048	13.0141	0.151836	0.328222	
TEG	99.8369	1.61527E-09	0	0.00154351	
N2	9.49154E-05	2.24144	2.5045	0.435133	
CO2	3.88604E-05	0.124528	0.00177134	0.0060897	
Methane	0.00611574	65.3328	51.279	28.5396	
Ethane	0.000452703	4.36474	19.7814	25.0244	
Propane	3.80287E-05	4.26311	15.7217	25.6748	
Isobutane	3.81042E-06	0.857293	2.40045	3.85338	
n-Butane	1.59397E-05	3.83998	5.85703	11.6454	
Isopentane	1.67975E-05	1.25641	1.27442	2.3755	
n-Pentane	2.7786E-05	1.04781	0.791339	1.62191	
i-Hexane	0.00140359	1.25543	0.157302	0.295557	
Heptane	3.13611E-10	0.0379723	0.00996934	0.0172029	
Octane	1.55642E-10	0.00480358	0.000901923	0.00127398	
Nonane	2.37193E-11	0.000145995	1.97292E-05	2.15924E-05	
n-Decane	1.06617E-11	1.19663E-05	1.18698E-06	1.00267E-06	
n-Hexane	8.30217E-10	0.0850779	0.035708	0.0683858	
Benzene	5.59176E-06	1.91477	0.0285086	0.0998632	

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	TEG Dehydration	

Mass Fraction	Blowdown %	BTEX OVHD %	Contactor Inlet %	Flash Gas %	MultiplierBypass-1 %
Toluene	5.21674E-06	0.331733	0.00336504	0.00924007	
Ethylbenzene	7.60878E-07	0.0107388	8.20142E-05	0.000177318	
o-Xylene	2.43617E-06	0.0145886	8.72345E-05	0.000170386	
MDEA	0.00424254	0.0012538	2.10382E-05	1.38766E-06	
Piperazine	0.030568	5.18361E-05	0.000473454	0.00100113	

Mass Flow	Blowdown lb/h	BTEX OVHD lb/h	Contactor Inlet lb/h	Flash Gas lb/h	MultiplierBypass-1 lb/h
H2S	0	0.00334489	0.395893	0.00134167	0
H2O	0	36.5494	341.752	0.40323	0
TEG	0	4.53641E-09	0	0.00189624	0
N2	0	6.29497	5637.13	0.534573	0
CO2	0	0.34973	3.98694	0.00748136	0
Methane	0	183.484	115419	35.0617	0
Ethane	0	12.2582	44523.9	30.7432	0
Propane	0	11.9728	35386.3	31.5422	0
Isobutane	0	2.40767	5402.93	4.73398	0
n-Butane	0	10.7844	13183	14.3066	0
Isopentane	0	3.52857	2868.47	2.91837	0
n-Pentane	0	2.94273	1781.15	1.99256	0
i-Hexane	0	3.52581	354.056	0.363099	0
Heptane	0	0.106643	22.439	0.0211342	0
Octane	0	0.0134906	2.03005	0.00156512	0
Nonane	0	0.00041002	0.0444066	2.65269E-05	0
n-Decane	0	3.36068E-05	0.00267166	1.23181E-06	0
n-Hexane	0	0.238937	80.3716	0.0840138	0
Benzene	0	5.37754	64.1673	0.122685	0
Toluene	0	0.931657	7.57404	0.0113517	0
Ethylbenzene	0	0.0301593	0.184598	0.00021784	0
o-Xylene	0	0.0409713	0.196347	0.000209324	0
MDEA	0	0.00352124	0.0473528	1.70477E-06	0
Piperazine	0	0.000145579	1.06565	0.00122991	0

Stream Properties

Property	Units	Blowdown	BTEX OVHD	Contactor Inlet	Flash Gas	MultiplierBypass-1
Temperature	°F		125	119.882	134.601	
Pressure	psia	14.65	14.25	1096.25	73.25	
Molecular Weight	lb/lbmol	148.746	18.9513	22.3105	28.1271	
Mass Flow	lb/h	0	280.845	225080	122.853	0
Std Vapor Volumetric Flow	MMSCFD	0	0.134969	91.8824	0.0397799	0
Std Liquid Volumetric Flow	sgpm	0	1.52103	1254.09	0.615868	0
Net Ideal Gas Heating Value	Btu/ft^3	3737.56	890.518	1191.95	1503.41	
Gross Ideal Gas Heating Value	Btu/ft^3	4086.19	990.477	1312	1646.29	

Remarks

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	TEG Dehydration	

Connections

	MultiplierInlet-1	MultiplierOutlet-1	To Slop Tank	To VRU	1
From Block	MultiplierMixer-I-1	--	MXSP-103	PIPE-1	To TEG
To Block	--	MultiplierMixer-O-1	BTEX to Slop Tank	BTEX to VRU	VLVE-102

Stream Composition

Mole Fraction	MultiplierInlet-1 %	MultiplierOutlet-1 %	To Slop Tank %	To VRU %	1 %
H2S		0.000101006 *	6.03861E-07	0.0120694	0
H2O		0.189625 *	99.9783	13.6339	0
TEG		0 *	2.1778E-05	1.85523E-10	0
N2		1.76798 *	1.3714E-05	1.50981	1.89607
CO2		0.000758027 *	1.58791E-05	0.0628785	0.0671419
Methane		76.7087 *	0.00141298	76.8493	95.832
Ethane		11.8649 *	6.20542E-05	2.76297	1.81344
Propane		6.07115 *	2.862E-05	1.91147	0.0681546
Isobutane		0.830122 *	2.37866E-06	0.308053	0.00405079
n-Butane		1.93292 *	1.82708E-05	1.34602	0.0140765
Isopentane		0.296297 *	2.8462E-06	0.38742	0.00860793
n-Pentane		0.222548 *	1.39798E-06	0.332776	0.0130638
i-Hexane		0 *	6.02897E-07	0.300777	0.283353
Heptane		0.0160074 *	1.41394E-08	0.0122467	0
Octane		0.00283274 *	7.95747E-10	0.00184843	0
Nonane		0.000298006 *	1.23264E-11	8.53811E-05	0
n-Decane		0 *	3.15643E-13	7.6603E-06	0
n-Hexane		0.0897765 *	5.87831E-08	0.0269788	0
Benzene		0.00406056 *	0.000609086	0.467089	0
Toluene		0.00165831 *	6.9724E-05	0.0693939	0
Ethylbenzene		6.9515E-05 *	1.49999E-06	0.00198301	0
o-Xylene		4.90432E-05 *	3.10616E-06	0.00268931	0
MDEA		3.12095E-06 *	2.50656E-05	0.000199123	0
Piperazine		0.000112641 *	0.0193931	1.06826E-05	0

Mass Fraction	MultiplierInlet-1 %	MultiplierOutlet-1 %	To Slop Tank %	To VRU %	1 %
H2S		0.000162662 *	1.1415E-06	0.0215077	0
H2O		0.161423 *	99.9024	12.8427	0
TEG		0 *	0.000181401	1.45675E-09	0
N2		2.3403 *	2.13088E-05	2.2115	3.16537
CO2		0.00157637 *	3.87615E-05	0.144692	0.176093
Methane		58.1491 *	0.00125729	64.4627	91.6187
Ethane		16.8582 *	0.000103495	4.34403	3.24956
Propane		12.6501 *	6.99994E-05	4.40718	0.179099
Isobutane		2.27988 *	7.66839E-06	0.936191	0.0140309
n-Butane		5.30864 *	5.89018E-05	4.09065	0.0487573
Isopentane		1.01014 *	1.139E-05	1.46153	0.037011
n-Pentane		0.758717 *	5.59445E-06	1.25539	0.0561696
i-Hexane		0 *	2.88174E-06	1.35527	1.45517
Heptane		0.0757923 *	7.85844E-08	0.064164	0
Octane		0.0152901 *	5.04172E-09	0.0110401	0
Nonane		0.00180604 *	8.7688E-11	0.000572577	0
n-Decane		0 *	2.491E-12	5.69892E-05	0
n-Hexane		0.365572 *	2.80973E-07	0.121564	0
Benzene		0.0149875 *	0.00263891	1.90772	0
Toluene		0.00721994 *	0.00035633	0.334318	0
Ethylbenzene		0.000348728 *	8.83282E-06	0.0110079	0
o-Xylene		0.00024603 *	1.82909E-05	0.0149286	0

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	TEG Dehydration	

Mass Fraction	MultiplierInlet-1 %	MultiplierOutlet-1 %	To Slop Tank %	To VRU %	1 %
MDEA		1.75733E-05 *	0.000165671	0.00124067	0
Piperazine		0.000458464 *	0.0926527	4.81122E-05	0

Mass Flow	MultiplierInlet-1 lb/h	MultiplierOutlet-1 lb/h	To Slop Tank lb/h	To VRU lb/h	1 lb/h
H2S			6.90517E-06	0.134039	0
H2O			604.329	80.0376	0
TEG			0.00109733	9.07868E-09	0
N2			0.000128901	13.7823	6.29855
CO2			0.000234476	0.901742	0.350396
Methane			0.00760562	401.74	182.306
Ethane			0.000626062	27.0726	6.46608
Propane			0.00042344	27.4661	0.356377
Isobutane			4.63876E-05	5.83447	0.0279191
n-Butane			0.000356309	25.4935	0.0970188
Isopentane			6.89003E-05	9.10847	0.0736456
n-Pentane			3.3842E-05	7.82376	0.111768
i-Hexane			1.74322E-05	8.44622	2.89554
Heptane			4.75372E-07	0.399879	0
Octane			3.04984E-08	0.0688037	0
Nonane			5.30442E-10	0.00356838	0
n-Decane			1.50686E-11	0.000355164	0
n-Hexane			1.69966E-06	0.7576	0
Benzene			0.0159633	11.8891	0
Toluene			0.00215551	2.08351	0
Ethylbenzene			5.34315E-05	0.0686027	0
o-Xylene			0.000110645	0.0930372	0
MDEA			0.00100218	0.00773205	0
Piperazine			0.560475	0.000299842	0

Stream Properties

Property	Units	MultiplierInlet-1	MultiplierOutlet-1	To Slop Tank	To VRU	1
Temperature	°F			187.106	132.009	79.8061
Pressure	psia			23.25 *	13.7122	133.25
Molecular Weight	lb/lbmol		21.1628	18.029	19.1251	16.7802
Mass Flow	lb/h			604.92	623.214	198.983
Std Vapor Volumetric Flow	MMSCFD			0.305585	0.296783	0.108
Std Liquid Volumetric Flow	sgpm			1.20976	3.35835	1.27934
Net Ideal Gas Heating Value	Btu/ft^3		1137.72	0.659156	899.481	916.235
Gross Ideal Gas Heating Value	Btu/ft^3		1254	51.0098	1000.07	1016.62

Remarks

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	TEG Dehydration	

Connections

	2	4	5	6	8
From Block	BTEX PUMP	MXSP-101	MXSP-100	EJ-44XXX BTEX Recovery Ejector	MXSP-104
To Block	MXSP-103	Sweet Gas	EJ-44XXX BTEX Recovery Ejector	MXSP-104	PIPE-1

Stream Composition

Mole Fraction	2 %	4 %	5 %	6 %	8 %
H2S	6.03861E-07	0.000114052	0.126772	0.0120694	0.0120694
H2O	99.9783	0.00144539	13.0673	13.6339	13.6339
TEG	2.1778E-05	0.000204894	1.32252E-12	1.85523E-10	1.85523E-10
N2	1.3714E-05	1.99923	1.44411	1.50981	1.50981
CO2	1.58791E-05	0.000897751	0.155938	0.0628785	0.0628785
Methane	0.00141298	71.4628	73.5356	76.8493	76.8493
Ethane	6.20542E-05	14.7004	2.88418	2.76297	2.76297
Propane	2.862E-05	7.96382	2.70872	1.91147	1.91147
Isobutane	2.37866E-06	0.922414	0.594881	0.308053	0.308053
n-Butane	1.82708E-05	2.24936	2.29088	1.34602	1.34602
Isopentane	2.8462E-06	0.394154	0.964596	0.38742	0.38742
n-Pentane	1.39798E-06	0.244626	0.911455	0.332776	0.332776
i-Hexane	6.02897E-07	0.0406887	0.549046	0.300777	0.300777
Heptane	1.41394E-08	0.00221237	0.0631767	0.0122467	0.0122467
Octane	7.95747E-10	0.000175271	0.0124215	0.00184843	0.00184843
Nonane	1.23264E-11	3.40638E-06	0.000727002	8.53811E-05	8.53811E-05
n-Decane	3.15643E-13	1.84137E-07	6.86609E-05	7.6603E-06	7.6603E-06
n-Hexane	5.87831E-08	0.00923115	0.110126	0.0269788	0.0269788
Benzene	0.000609086	0.00746154	0.492561	0.467089	0.467089
Toluene	6.9724E-05	0.000715019	0.0810797	0.0693939	0.0693939
Ethylbenzene	1.49999E-06	1.44384E-05	0.00264733	0.00198301	0.00198301
o-Xylene	3.10616E-06	1.45289E-05	0.00354542	0.00268931	0.00268931
MDEA	2.50656E-05	8.45933E-08	0.000196328	0.000199123	0.000199123
Piperazine	0.0193931	6.89644E-05	3.42022E-06	1.06826E-05	1.06826E-05

Mass Fraction	2 %	4 %	5 %	6 %	8 %
H2S	1.1415E-06	0.000174197	0.206993	0.0215077	0.0215077
H2O	99.9024	0.00116695	11.2784	12.8427	12.8427
TEG	0.000181401	0.00137895	9.51513E-12	1.45675E-09	1.45675E-09
N2	2.13088E-05	2.50989	1.93815	2.2115	2.2115
CO2	3.87615E-05	0.00177064	0.328791	0.144692	0.144692
Methane	0.00125729	51.378	56.5183	64.4627	64.4627
Ethane	0.000103495	19.8096	4.15491	4.34403	4.34403
Propane	6.99994E-05	15.7378	5.72244	4.40718	4.40718
Isobutane	7.66839E-06	2.40267	1.65651	0.936191	0.936191
n-Butane	5.89018E-05	5.85906	6.3792	4.09065	4.09065
Isopentane	1.139E-05	1.27445	3.33423	1.46153	1.46153
n-Pentane	5.59445E-06	0.790967	3.15054	1.25539	1.25539
i-Hexane	2.88174E-06	0.157139	2.2668	1.35527	1.35527
Heptane	7.85844E-08	0.00993483	0.303287	0.064164	0.064164
Octane	5.04172E-09	0.000897245	0.0679783	0.0110401	0.0110401
Nonane	8.7688E-11	1.95792E-05	0.00446716	0.000572577	0.000572577
n-Decane	2.491E-12	1.17413E-06	0.000468036	5.69892E-05	5.69892E-05
n-Hexane	2.80973E-07	0.0356505	0.454667	0.121564	0.121564
Benzene	0.00263891	0.0261199	1.84331	1.90772	1.90772
Toluene	0.00035633	0.00295247	0.35791	0.334318	0.334318
Ethylbenzene	8.83282E-06	6.86955E-05	0.0134651	0.0110079	0.0110079

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:	
Location:	Titan Treater #2		
Flowsheet:	TEG Dehydration		

Mass Fraction	2 %	4 %	5 %	6 %	8 %
o-Xylene	1.82909E-05	6.91261E-05	0.0180331	0.0149286	0.0149286
MDEA	0.000165671	4.51753E-07	0.00112084	0.00124067	0.00124067
Piperazine	0.0926527	0.000266216	1.41142E-05	4.81122E-05	4.81122E-05

Mass Flow	2 lb/h	4 lb/h	5 lb/h	6 lb/h	8 lb/h
H2S	3.45259E-06	0.782407	0.0636745	0.0670193	0.134039
H2O	302.165	5.24136	3.46941	40.0188	80.0376
TEG	0.000548665	6.19356	2.92701E-12	4.53934E-09	9.07868E-09
N2	6.44507E-05	11273.2	0.596207	6.89117	13.7823
CO2	0.000117238	7.95284	0.101141	0.450871	0.901742
Methane	0.00380281	230765	17.3859	200.87	401.74
Ethane	0.000313031	88975	1.27812	13.5363	27.0726
Propane	0.00021172	70686.5	1.76031	13.7331	27.4661
Isobutane	2.31938E-05	10791.6	0.509568	2.91723	5.83447
n-Butane	0.000178154	26316	1.96234	12.7467	25.4935
Isopentane	3.44501E-05	5724.2	1.02566	4.55424	9.10847
n-Pentane	1.6921E-05	3552.64	0.969156	3.91188	7.82376
i-Hexane	8.71611E-06	705.792	0.697303	4.22311	8.44622
Heptane	2.37686E-07	44.6225	0.093296	0.199939	0.399879
Octane	1.52492E-08	4.02999	0.0209112	0.0344018	0.0688037
Nonane	2.65221E-10	0.0879401	0.00137417	0.00178419	0.00356838
n-Decane	7.53429E-12	0.00527364	0.000143975	0.000177582	0.000355164
n-Hexane	8.4983E-07	160.125	0.139863	0.3788	0.7576
Benzene	0.00798165	117.318	0.567031	5.94457	11.8891
Toluene	0.00107775	13.2611	0.110099	1.04176	2.08351
Ethylbenzene	2.67157E-05	0.308547	0.00414208	0.0343014	0.0686027
o-Xylene	5.53226E-05	0.310481	0.00554726	0.0465186	0.0930372
MDEA	0.000501088	0.00202906	0.000344788	0.00386603	0.00773205
Piperazine	0.280237	1.19571	4.34176E-06	0.000149921	0.000299842

Stream Properties

Property	Units	2	4	5	6	8
Temperature	°F	187.106	125.68	200	132.147	132.147
Pressure	psia	23.25	1091.25	63.25	13.85 *	13.85
Molecular Weight	lb/lbmol	18.029	22.3138	20.8727	19.1251	19.1251
Mass Flow	lb/h	302.46	449152	30.7616	311.607	623.214
Std Vapor Volumetric Flow	MMSCFD	0.152792	183.326	0.0134225	0.148391	0.296783
Std Liquid Volumetric Flow	sgpm	0.604878	2505.26	0.158143	1.67917	3.35835
Net Ideal Gas Heating Value	Btu/ft^3	0.659156	1193.92	989.613	899.481	899.481
Gross Ideal Gas Heating Value	Btu/ft^3	51.0098	1314.09	1096.5	1000.07	1000.07

Remarks

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	TEG Dehydration	

Connections

	11	12	13	14	15
From Block	VLVE-102	T-44350b (Stahl)	--	T-44350b (Stahl)	RCYL-2
To Block	T-44350b (Stahl)	RCYL-2	MKUP-1	AC-44300 LEAN/RICH EXCHANGER	T-44350 STILL COLUMN

Stream Composition

Mole Fraction	11 %	12 %	13 %	14 %	15 %
H2S	0	2.53219E-08	0 *	6.81567E-12	2.3898E-08
H2O	0	29.1405	0.827516 *	0.991197	29.1385
TEG	0	6.04557	99.1725 *	98.8884	6.04581
N2	1.89607	1.22721	0 *	0.000503984	1.22729
CO2	0.0671419	0.042993	0 *	0.000131343	0.0429898
Methane	95.832	61.8973	0 *	0.0567054	61.9012
Ethane	1.81344	1.1665	0 *	0.00223944	1.16673
Propane	0.0681546	0.0436626	0 *	0.000128281	0.0437859
Isobutane	0.00405079	0.00258684	0 *	9.75161E-06	0.00259668
n-Butane	0.0140765	0.00896395	0 *	4.07928E-05	0.00898325
Isopentane	0.00860793	0.00544359	0 *	3.46307E-05	0.00544224
n-Pentane	0.0130638	0.00824208	0 *	5.72853E-05	0.00823745
i-Hexane	0.283353	0.174197	0 *	0.00242272	0.17367
Heptane	0	8.25694E-07	0 *	4.65544E-10	8.28825E-07
Octane	0	2.21422E-07	0 *	2.02674E-10	2.22994E-07
Nonane	0	1.62228E-08	0 *	2.75089E-11	1.66332E-08
n-Decane	0	3.49297E-09	0 *	1.11461E-11	3.51263E-09
n-Hexane	0	2.2021E-06	0 *	1.43303E-09	5.19002E-05
Benzene	0	0.00223684	0 *	1.06482E-05	0.00222819
Toluene	0	0.000959104	0 *	8.42179E-06	0.00097812
Ethylbenzene	0	6.86596E-05	0 *	1.06606E-06	7.10732E-05
o-Xylene	0	0.000161211	0 *	3.41328E-06	0.00016507
MDEA	0	0.00130518	0 *	0.00529583	0.00130461
Piperazine	0	0.232117	0 *	0.0527874	0.230007

Mass Fraction	11 %	12 %	13 %	14 %	15 %
H2S	0	3.40268E-08	0 *	1.56161E-12	3.21152E-08
H2O	0	20.6991	0.1 *	0.120048	20.6988
TEG	0	35.7966	99.9 *	99.8369	35.8001
N2	3.16537	1.3555	0 *	9.49154E-05	1.35566
CO2	0.176093	0.0746032	0 *	3.88604E-05	0.0746019
Methane	91.6187	39.1522	0 *	0.00611574	39.1568
Ethane	3.24956	1.38299	0 *	0.000452703	1.38334
Propane	0.179099	0.0759134	0 *	3.80287E-05	0.0761321
Isobutane	0.0140309	0.00592824	0 *	3.81042E-06	0.00595111
n-Butane	0.0487573	0.0205426	0 *	1.59397E-05	0.020588
Isopentane	0.037011	0.0154856	0 *	1.67975E-05	0.0154826
n-Pentane	0.0561696	0.0234466	0 *	2.7786E-05	0.0234347
i-Hexane	1.45517	0.591884	0 *	0.00140359	0.590128
Heptane	0	3.26219E-06	0 *	3.13611E-10	3.27474E-06
Octane	0	9.97261E-07	0 *	1.55642E-10	1.0044E-06
Nonane	0	8.20377E-08	0 *	2.37193E-11	8.4118E-08
n-Decane	0	1.95955E-08	0 *	1.06617E-11	1.9707E-08
n-Hexane	0	7.48227E-06	0 *	8.30217E-10	0.000176356
Benzene	0	0.00688914	0 *	5.59176E-06	0.00686288
Toluene	0	0.00348433	0 *	5.21674E-06	0.00355362
Ethylbenzene	0	0.000287406	0 *	7.60878E-07	0.000297526
o-Xylene	0	0.000674821	0 *	2.43617E-06	0.000691014
MDEA	0	0.00613227	0 *	0.00424254	0.00612996
Piperazine	0	0.788319	0 *	0.030568	0.7812

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	TEG Dehydration	

Mass Flow	11 lb/h	12 lb/h	13 lb/h	14 lb/h	15 lb/h
H2S	0	1.57842E-07	0 *	1.76342E-10	1.48957E-07
H2O	0	96.018	0.00297278 *	13.5562	96.0054
TEG	0	166.052	2.96981 *	11273.9	166.048
N2	6.29855	6.28784	0 *	0.0107181	6.28785
CO2	0.350396	0.346066	0 *	0.00438823	0.346019
Methane	182.306	181.618	0 *	0.690608	181.617
Ethane	6.46608	6.41535	0 *	0.0511206	6.41621
Propane	0.356377	0.352144	0 *	0.00429431	0.353116
Isobutane	0.0279191	0.0274997	0 *	0.000430284	0.0276025
n-Butane	0.0970188	0.095292	0 *	0.00179996	0.0954911
Isopentane	0.0736456	0.0718339	0 *	0.00189682	0.0718115
n-Pentane	0.111768	0.108763	0 *	0.00313768	0.108695
i-Hexane	2.89554	2.74561	0 *	0.158497	2.73713
Heptane	0	1.51325E-05	0 *	3.54138E-08	1.51889E-05
Octane	0	4.62605E-06	0 *	1.75756E-08	4.6586E-06
Nonane	0	3.80553E-07	0 *	2.67846E-09	3.90156E-07
n-Decane	0	9.08989E-08	0 *	1.20395E-09	9.14049E-08
n-Hexane	0	3.47084E-05	0 *	9.37506E-08	0.000817974
Benzene	0	0.0319571	0 *	0.000631439	0.0318314
Toluene	0	0.016163	0 *	0.00058909	0.0164824
Ethylbenzene	0	0.00133321	0 *	8.59206E-05	0.00137999
o-Xylene	0	0.00313033	0 *	0.0002751	0.00320507
MDEA	0	0.0284461	0 *	0.479081	0.028432
Piperazine	0	3.65682	0 *	3.45183	3.62336

Stream Properties

Property	Units	11	12	13	14	15
Temperature	°F	72.0232	384.567	100 *	374.264	384.568
Pressure	psia	15.75 *	14.95	25.45 *	15.15	14.95
Molecular Weight	lb/lbmol	16.7802	25.3622	149.079	148.746	25.3608
Mass Flow	lb/h	198.983	463.876	2.97278	11292.3	463.82
Std Vapor Volumetric Flow	MMSCFD	0.108 *	0.166579	0.000181614	0.691419	0.166568
Std Liquid Volumetric Flow	sgpm	1.27934	1.77007	0.00526169	19.9947	1.76993
Net Ideal Gas Heating Value	Btu/ft^3	916.235	827.207	3745.75	3737.56	827.171
Gross Ideal Gas Heating Value	Btu/ft^3	1016.62	928.529	4095.08	4086.19	928.491

Remarks

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	TEG Dehydration	

Connections

	16	18	37A	58	59
From Block	BTEX Motive Gas	AC-44150 GAS/GLYCOL EXCHANGER	TEG INLET	T-44125 TEG CONTACTOR	AC-44150 GAS/GLYCOL EXCHANGER
To Block	MXSP-100	MXSP-101	F-44100 TEG INLET FILTER COALESCER	AC-44150 GAS/GLYCOL EXCHANGER	RCYL-1

Stream Composition

Mole Fraction	16 %	18 %	37A %	58 %	59 %
H2S	0.126772	0.000114052	0.000115144	0.000114052	0
H2O	13.0673	0.00144539	0.188036	0.00144539	0.991154
TEG	1.32252E-12	0.000204894	0	0.000204894	98.8885
N2	1.44411	1.99923	1.99464	1.99923	0.000503852
CO2	0.155938	0.000897751	0.000897977	0.000897751	0.000131308
Methane	73.5356	71.4628	71.3146	71.4628	0.0566905
Ethane	2.88418	14.7004	14.6773	14.7004	0.00223885
Propane	2.70872	7.96382	7.95449	7.96382	0.000128247
Isobutane	0.594881	0.922414	0.921424	0.922414	9.74905E-06
n-Butane	2.29088	2.24936	2.24825	2.24936	4.07821E-05
Isopentane	0.964596	0.394154	0.394089	0.394154	3.46216E-05
n-Pentane	0.911455	0.244626	0.244705	0.244626	5.72703E-05
i-Hexane	0.549046	0.0406887	0.040725	0.0406887	0.00242208
Heptane	0.0631767	0.00221237	0.00221973	0.00221237	0
Octane	0.0124215	0.000175271	0.000176159	0.000175271	0
Nonane	0.000727002	3.40638E-06	3.43198E-06	3.40638E-06	0
n-Decane	6.86609E-05	1.84137E-07	1.86125E-07	1.84137E-07	0
n-Hexane	0.110126	0.00923115	0.00924467	0.00923115	0
Benzene	0.492561	0.00746154	0.00814271	0.00746154	1.06454E-05
Toluene	0.0810797	0.000715019	0.000814815	0.000715019	8.41958E-06
Ethylbenzene	0.00264733	1.44384E-05	1.72352E-05	1.44384E-05	1.06578E-06
o-Xylene	0.00354542	1.45289E-05	1.83323E-05	1.45289E-05	3.41239E-06
MDEA	0.000196328	8.45933E-08	3.93894E-06	8.45933E-08	0.00529444
Piperazine	3.42022E-06	6.89644E-05	0.000122632	6.89644E-05	0.0527735

Mass Fraction	16 %	18 %	37A %	58 %	59 %
H2S	0.206993	0.000174197	0.00017589	0.000174197	0
H2O	11.2784	0.00116695	0.151836	0.00116695	0.120043
TEG	9.51513E-12	0.00137895	0	0.00137895	99.8369
N2	1.93815	2.50989	2.5045	2.50989	9.48905E-05
CO2	0.328791	0.00177064	0.00177134	0.00177064	3.88502E-05
Methane	56.5183	51.378	51.279	51.378	0.00611413
Ethane	4.15491	19.8096	19.7814	19.8096	0.000452584
Propane	5.72244	15.7378	15.7217	15.7378	3.80187E-05
Isobutane	1.65651	2.40267	2.40045	2.40267	3.80941E-06
n-Butane	6.3792	5.85906	5.85703	5.85906	1.59355E-05
Isopentane	3.33423	1.27445	1.27442	1.27445	1.6793E-05
n-Pentane	3.15054	0.790967	0.791339	0.790967	2.77787E-05
i-Hexane	2.2668	0.157139	0.157302	0.157139	0.00140322
Heptane	0.303287	0.00993483	0.00996934	0.00993483	0
Octane	0.0679783	0.000897245	0.000901923	0.000897245	0
Nonane	0.00446716	1.95792E-05	1.97292E-05	1.95792E-05	0
n-Decane	0.000468036	1.17413E-06	1.18698E-06	1.17413E-06	0
n-Hexane	0.454667	0.0356505	0.035708	0.0356505	0
Benzene	1.84331	0.0261199	0.0285086	0.0261199	5.59029E-06
Toluene	0.35791	0.00295247	0.00336504	0.00295247	5.21537E-06
Ethylbenzene	0.0134651	6.86955E-05	8.20142E-05	6.86955E-05	7.60678E-07
o-Xylene	0.0180331	6.91261E-05	8.72345E-05	6.91261E-05	2.43553E-06

* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	TEG Dehydration	

Mass Fraction	16 %	18 %	37A %	58 %	59 %
MDEA	0.00112084	4.51753E-07	2.10382E-05	4.51753E-07	0.00424143
Piperazine	1.41142E-05	0.000266216	0.000473454	0.000266216	0.0305599

Mass Flow	16 lb/h	18 lb/h	37A lb/h	58 lb/h	59 lb/h
H2S	0.127349	0.391203	0.395893	0.391203	0
H2O	6.93882	2.62068	341.752	2.62068	13.5592
TEG	5.85401E-12	3.09678	0	3.09678	11276.9
N2	1.19241	5636.61	5637.13	5636.61	0.0107181
CO2	0.202283	3.97642	3.98694	3.97642	0.00438823
Methane	34.7719	115383	115419	115383	0.690608
Ethane	2.55624	44487.5	44523.9	44487.5	0.0511206
Propane	3.52063	35343.2	35386.3	35343.2	0.00429431
Isobutane	1.01914	5395.82	5402.93	5395.82	0.000430284
n-Butane	3.92469	13158	13183	13158	0.00179996
Isopentane	2.05132	2862.1	2868.47	2862.1	0.00189682
n-Pentane	1.93831	1776.32	1781.15	1776.32	0.00313768
i-Hexane	1.39461	352.896	354.056	352.896	0.158497
Heptane	0.186592	22.3112	22.439	22.3112	0
Octane	0.0418224	2.01499	2.03005	2.01499	0
Nonane	0.00274834	0.0439701	0.0444066	0.0439701	0
n-Decane	0.000287951	0.00263682	0.00267166	0.00263682	0
n-Hexane	0.279726	80.0623	80.3716	80.0623	0
Benzene	1.13406	58.659	64.1673	58.659	0.000631439
Toluene	0.220198	6.63053	7.57404	6.63053	0.00058909
Ethylbenzene	0.00828416	0.154274	0.184598	0.154274	8.59206E-05
o-Xylene	0.0110945	0.15524	0.196347	0.15524	0.0002751
MDEA	0.000689575	0.00101453	0.0473528	0.00101453	0.479081
Piperazine	8.68352E-06	0.597857	1.06565	0.597857	3.45183

Stream Properties

Property	Units	16	18	37A	58	59
Temperature	°F	200	125.68	119.882	123.154	143 *
Pressure	psia	63.25	1091.25	1096.25	1094.25	1208.25
Molecular Weight	lb/lbmol	20.8727	22.3138	22.3105	22.3138	148.746
Mass Flow	lb/h	61.5232	224576	225080	224576	11295.3
Std Vapor Volumetric Flow	MMSCFD	0.0268451	91.6631	91.8824	91.6631	0.691601
Std Liquid Volumetric Flow	sgpm	0.316286	1252.63	1254.09	1252.63	20
Net Ideal Gas Heating Value	Btu/ft^3	989.613	1193.92	1191.95	1193.92	3737.56
Gross Ideal Gas Heating Value	Btu/ft^3	1096.5	1314.09	1312	1314.09	4086.19

Remarks

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	TEG Dehydration	

Connections

	59A	60	61	62	63
From Block	RCYL-1	T-44125 TEG CONTACTOR	VLVE-100	T-44350 STILL COLUMN TUBE SIDE	V-44275 TEG FLASH TANK
To Block	T-44125 TEG CONTACTOR	VLVE-100	T-44350 STILL COLUMN TUBE SIDE	V-44275 TEG FLASH TANK	AC-44300 LEAN/RICH EXCHANGER

Stream Composition

Mole Fraction	59A %	60 %	61 %	62 %	63 %
H2S	0	0.000137583	0.000137583	0.000137583	0.00010271
H2O	0.990851	19.5726	19.5726	19.5726	20.4429
TEG	98.8895	75.0555	75.0555	75.0555	78.4826
N2	0.000704997	0.0193353	0.0193353	0.0193353	0.000268674
CO2	2.54159E-05	0.000258253	0.000258253	0.000258253	9.23294E-05
Methane	0.0531795	2.30177	2.30177	2.30177	0.122044
Ethane	0.00717973	1.21645	1.21645	1.21645	0.203134
Propane	0.00254994	0.978606	0.978606	0.978606	0.275486
Isobutane	0.000163093	0.122371	0.122371	0.122371	0.0428099
n-Butane	0.000274534	0.429957	0.429957	0.429957	0.192262
Isopentane	1.92986E-05	0.0883423	0.0883423	0.0883423	0.0500896
n-Pentane	1.57766E-05	0.0668844	0.0668844	0.0668844	0.0410667
i-Hexane	0	0.0134618	0.0134618	0.0134618	0.00967164
Heptane	0	0.00127491	0.00127491	0.00127491	0.00111263
Octane	0	0.000131773	0.000131773	0.000131773	0.000123466
Nonane	0	3.40291E-06	3.40291E-06	3.40291E-06	3.34206E-06
n-Decane	0	2.44805E-07	2.44805E-07	2.44805E-07	2.46933E-07
n-Hexane	0.000197735	0.00373767	0.00373767	0.00373767	0.00288914
Benzene	1.15936E-05	0.0705105	0.0705105	0.0705105	0.0720881
Toluene	1.21115E-05	0.010247	0.010247	0.010247	0.0105861
Ethylbenzene	1.47289E-06	0.000286686	0.000286686	0.000286686	0.000297631
o-Xylene	4.08545E-06	0.000390212	0.000390212	0.000390212	0.000405968
MDEA	0.00482696	0.00405337	0.00405337	0.00405337	0.00423844
Piperazine	0.0504386	0.0437222	0.0437222	0.0437222	0.0457037

Mass Fraction	59A %	60 %	61 %	62 %	63 %
H2S	0	3.97476E-05	3.97476E-05	3.97476E-05	2.86756E-05
H2O	0.120007	2.98898	2.98898	2.98898	3.01698
TEG	99.8385	95.5453	95.5453	95.5453	96.5505
N2	0.000132773	0.00459147	0.00459147	0.00459147	6.16569E-05
CO2	7.51983E-06	9.63443E-05	9.63443E-05	9.63443E-05	3.32871E-05
Methane	0.0057355	0.313016	0.313016	0.313016	0.0160389
Ethane	0.00145139	0.310062	0.310062	0.310062	0.050037
Propane	0.00075593	0.365795	0.365795	0.365795	0.0995138
Isobutane	6.37284E-05	0.0602912	0.0602912	0.0602912	0.0203833
n-Butane	0.000107274	0.211837	0.211837	0.211837	0.0915428
Isopentane	9.36077E-06	0.0540297	0.0540297	0.0540297	0.029605
n-Pentane	7.65243E-06	0.0409062	0.0409062	0.0409062	0.0242721
i-Hexane	0	0.00983381	0.00983381	0.00983381	0.00682767
Heptane	0	0.00108291	0.00108291	0.00108291	0.000913304
Octane	0	0.000127596	0.000127596	0.000127596	0.000115535
Nonane	0	3.69964E-06	3.69964E-06	3.69964E-06	3.51139E-06
n-Decane	0	2.9526E-07	2.9526E-07	2.9526E-07	2.87817E-07
n-Hexane	0.000114558	0.00273035	0.00273035	0.00273035	0.00203958
Benzene	6.08822E-06	0.046688	0.046688	0.046688	0.0461285
Toluene	7.50233E-06	0.00800334	0.00800334	0.00800334	0.00799032
Ethylbenzene	1.05125E-06	0.000258002	0.000258002	0.000258002	0.00025885
o-Xylene	2.91593E-06	0.000351169	0.000351169	0.000351169	0.000353072
MDEA	0.00386695	0.00409439	0.00409439	0.00409439	0.00413746

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:	
Location:	Titan Treater #2		
Flowsheet:	TEG Dehydration		

Mass Fraction	59A %	60 %	61 %	62 %	63 %
Piperazine	0.029208	0.0319242	0.0319242	0.0319242	0.0322495

Mass Flow	59A lb/h	60 lb/h	61 lb/h	62 lb/h	63 lb/h
H2S	0	0.00469003	0.00469003	0.00469003	0.00334836
H2O	13.555	352.686	352.686	352.686	352.283
TEG	11277	11273.9	11273.9	11273.9	11273.9
N2	0.014997	0.541772	0.541772	0.541772	0.00719947
CO2	0.000849382	0.0113682	0.0113682	0.0113682	0.00388682
Methane	0.647838	36.9345	36.9345	36.9345	1.87281
Ethane	0.163938	36.5858	36.5858	36.5858	5.84266
Propane	0.085384	43.1621	43.1621	43.1621	11.6199
Isobutane	0.00719827	7.11408	7.11408	7.11408	2.3801
n-Butane	0.0121168	24.9958	24.9958	24.9958	10.6892
Isopentane	0.00105732	6.37525	6.37525	6.37525	3.45688
n-Pentane	0.00086436	4.82674	4.82674	4.82674	2.83418
i-Hexane	0	1.16034	1.16034	1.16034	0.797245
Heptane	0	0.127778	0.127778	0.127778	0.106644
Octane	0	0.0150557	0.0150557	0.0150557	0.0134906
Nonane	0	0.00043654	0.00043654	0.00043654	0.000410013
n-Decane	0	3.48393E-05	3.48393E-05	3.48393E-05	3.36075E-05
n-Hexane	0.0129395	0.322169	0.322169	0.322169	0.238155
Benzene	0.000687679	5.50897	5.50897	5.50897	5.38628
Toluene	0.000847405	0.944356	0.944356	0.944356	0.933005
Ethylbenzene	0.000118741	0.030443	0.030443	0.030443	0.0302251
o-Xylene	0.000329361	0.0414364	0.0414364	0.0414364	0.041227
MDEA	0.436781	0.483119	0.483119	0.483119	0.483117
Piperazine	3.29911	3.7669	3.7669	3.7669	3.76567

Stream Properties

Property	Units	59A	60	61	62	63
Temperature	°F	143	121.995	125.907	134.601	134.601
Pressure	psia	1208.25	1096.25	78.25 *	73.25	73.25
Molecular Weight	lb/lbmol	148.746	117.968	117.968	117.968	122.071
Mass Flow	lb/h	11295.2	11799.5	11799.5	11799.5	11676.7
Std Vapor Volumetric Flow	MMSCFD	0.691601	0.910971	0.910971	0.910971	0.871191
Std Liquid Volumetric Flow	sgpm	20	21.4573	21.4573	21.4573	20.8414
Net Ideal Gas Heating Value	Btu/ft^3	3737.53	2925.87	2925.87	2925.87	2990.82
Gross Ideal Gas Heating Value	Btu/ft^3	4086.15	3208.07	3208.07	3208.07	3279.38

Remarks

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	TEG Dehydration	

Connections

	64	64A	65	66	67
From Block	AC-44300 LEAN/RICH EXCHANGER	VLVE-101	T-44350 STILL COLUMN	T-44350 STILL COLUMN CONDENSER	T-44350 STILL COLUMN CONDENSER
To Block	VLVE-101	T-44350 STILL COLUMN	T-44350 STILL COLUMN CONDENSER	T-44350 STILL COLUMN	AC-44400 BTEX Condenser

Stream Composition

Mole Fraction	64 %	64A %	65 %	66 %	67 %
H2S	0.00010271	0.00010271	0.000282703	2.2066E-07	0.000310951
H2O	20.4429	20.4429	63.1158	99.2088	59.5065
TEG	78.4826	78.4826	0.00246511	0.0270006	1.15636E-05
N2	0.000268674	0.000268674	0.646565	6.38168E-06	0.711221
CO2	9.23294E-05	9.23294E-05	0.0228729	5.51188E-06	0.0251596
Methane	0.122044	0.122044	32.9092	0.000638742	36.2
Ethane	0.203134	0.203134	1.173	2.46909E-05	1.2903
Propane	0.275486	0.275486	0.781244	1.2097E-05	0.859367
Isobutane	0.0428099	0.0428099	0.11919	8.66538E-07	0.131108
n-Butane	0.192262	0.192262	0.533877	8.13073E-06	0.587264
Isopentane	0.0500896	0.0500896	0.14072	1.14148E-06	0.154791
n-Pentane	0.0410667	0.0410667	0.117355	8.1384E-07	0.129091
i-Hexane	0.00967164	0.00967164	0.117722	3.98627E-07	0.129494
Heptane	0.00111263	0.00111263	0.00306224	7.29845E-09	0.00336846
Octane	0.000123466	0.000123466	0.000339811	5.08659E-10	0.000373792
Nonane	3.34206E-06	3.34206E-06	9.19836E-06	5.05914E-12	1.01182E-05
n-Decane	2.46933E-07	2.46933E-07	6.79606E-07	1.61605E-13	7.47567E-07
n-Hexane	0.00288914	0.00288914	0.00797778	3.33822E-08	0.00877556
Benzene	0.0720881	0.0720881	0.198391	0.00016162	0.218214
Toluene	0.0105861	0.0105861	0.0291289	1.99236E-05	0.0320398
Ethylbenzene	0.000297631	0.000297631	0.000818131	3.91479E-07	0.000899905
o-Xylene	0.000405968	0.000405968	0.00111197	8.17488E-07	0.00122309
MDEA	0.00423844	0.00423844	9.83266E-05	1.32483E-05	0.000106834
Piperazine	0.0457037	0.0457037	0.0787544	0.763273	0.0103025

Mass Fraction	64 %	64A %	65 %	66 %	67 %
H2S	2.86756E-05	2.86756E-05	0.000521601	4.04947E-07	0.00057403
H2O	3.01698	3.01698	61.557	96.2399	58.0681
TEG	96.5505	96.5505	0.0200413	0.218338	9.40622E-05
N2	6.16569E-05	6.16569E-05	0.980564	9.62642E-06	1.0792
CO2	3.32871E-05	3.32871E-05	0.0544961	1.3062E-05	0.0599767
Methane	0.0160389	0.0160389	28.5815	0.000551773	31.4566
Ethane	0.050037	0.050037	1.90948	3.99779E-05	2.10156
Propane	0.0995138	0.0995138	1.865	2.87234E-05	2.05261
Isobutane	0.0203833	0.0203833	0.375041	2.71202E-06	0.412767
n-Butane	0.0915428	0.0915428	1.67989	2.54469E-05	1.84887
Isopentane	0.029605	0.029605	0.549644	4.43468E-06	0.604934
n-Pentane	0.0242721	0.0242721	0.458385	3.16178E-06	0.504495
i-Hexane	0.00682767	0.00682767	0.549209	1.84975E-06	0.604455
Heptane	0.000913304	0.000913304	0.0166116	3.93795E-08	0.0182826
Octane	0.000115535	0.000115535	0.0021014	3.12871E-09	0.00231279
Nonane	3.51139E-06	3.51139E-06	6.38679E-05	3.49394E-11	7.02926E-05
n-Decane	2.87817E-07	2.87817E-07	5.23485E-06	1.23813E-12	5.76144E-06
n-Hexane	0.00203958	0.00203958	0.0372189	1.54904E-07	0.0409628
Benzene	0.0461285	0.0461285	0.838953	0.000679791	0.923278
Toluene	0.00799032	0.00799032	0.145299	9.8849E-05	0.159905
Ethylbenzene	0.00025885	0.00025885	0.00470221	2.23797E-06	0.00517499
o-Xylene	0.000353072	0.000353072	0.00639106	4.67333E-06	0.00703348
MDEA	0.00413746	0.00413746	0.000634318	8.50082E-05	0.000689575

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:	
Location:	Titan Treater #2		
Flowsheet:	TEG Dehydration		

Mass Fraction	64 %	64A %	65 %	66 %	67 %
Piperazine	0.0322495	0.0322495	0.367244	3.54019	0.048068

Mass Flow	64 lb/h	64A lb/h	65 lb/h	66 lb/h	67 lb/h
H2S	0.00334836	0.00334836	0.00334858	2.37608E-07	0.00334835
H2O	352.283	352.283	395.184	56.4701	338.714
TEG	11273.9	11273.9	0.128661	0.128113	0.00054867
N2	0.00719947	0.00719947	6.29504	5.64844E-06	6.29503
CO2	0.00388682	0.00388682	0.349855	7.66432E-06	0.349847
Methane	1.87281	1.87281	183.488	0.00032376	183.488
Ethane	5.84266	5.84266	12.2585	2.34576E-05	12.2585
Propane	11.6199	11.6199	11.973	1.68539E-05	11.973
Isobutane	2.3801	2.3801	2.40769	1.59132E-06	2.40769
n-Butane	10.6892	10.6892	10.7846	1.49313E-05	10.7846
Isopentane	3.45688	3.45688	3.52861	2.60211E-06	3.52861
n-Pentane	2.83418	2.83418	2.94274	1.85522E-06	2.94274
i-Hexane	0.797245	0.797245	3.52582	1.08537E-06	3.52582
Heptane	0.106644	0.106644	0.106644	2.31065E-08	0.106644
Octane	0.0134906	0.0134906	0.0134906	1.83581E-09	0.0134906
Nonane	0.000410013	0.000410013	0.00041002	2.05012E-11	0.00041002
n-Decane	3.36075E-05	3.36075E-05	3.36068E-05	7.26492E-13	3.36068E-05
n-Hexane	0.238155	0.238155	0.238938	9.0892E-08	0.238938
Benzene	5.38628	5.38628	5.38592	0.000398877	5.38552
Toluene	0.933005	0.933005	0.932793	5.8001E-05	0.932735
Ethylbenzene	0.0302251	0.0302251	0.0301873	1.31316E-06	0.030186
o-Xylene	0.041227	0.041227	0.0410294	2.74214E-06	0.0410267
MDEA	0.483117	0.483117	0.00407221	4.98798E-05	0.00402233
Piperazine	3.76567	3.76567	2.35764	2.07726	0.280383

Stream Properties

Property	Units	64	64A	65	66	67
Temperature	°F	302.5 *	301.494	194.495	185.777	185.777
Pressure	psia	57.25	27.25	14.25	14.25	14.25
Molecular Weight	lb/lbmol	122.071	122.071	18.4715	18.571	18.4616
Mass Flow	lb/h	11676.7	11676.7	641.981	58.6764	583.305
Std Vapor Volumetric Flow	MMSCFD	0.871191	0.871191	0.316537	0.0287761	0.287761
Std Liquid Volumetric Flow	sgpm	20.8414	20.8414	2.24479	0.118881	2.12591
Net Ideal Gas Heating Value	Btu/ft^3	2990.82	2990.82	382.329	25.3189	418.03
Gross Ideal Gas Heating Value	Btu/ft^3	3279.38	3279.38	453.976	77.245	491.649

Remarks

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	TEG Dehydration	

Connections

	68	69	70	71	72
From Block	AC-44400 BTEX Condenser	V-44450 BTEX Separator	T-44350 STILL COLUMN	E-44325 TEG GLYCOL REBOILER/SURGE TANK	E-44325 TEG GLYCOL REBOILER/SURGE TANK
To Block	V-44450 BTEX Separator	BTEX PUMP	E-44325 TEG GLYCOL REBOILER/SURGE TANK	T-44350 STILL COLUMN	T-44350b (Stahl)

Stream Composition

Mole Fraction	68 %	69 %	70 %	71 %	72 %
H2S	0.000310951	6.03861E-07	8.69737E-08	8.73238E-07	5.63044E-09
H2O	59.5065	99.9783	15.3271	92.0851	7.38605
TEG	1.15636E-05	2.1778E-05	84.5151	7.26087	92.5075
N2	0.711221	1.3714E-05	0.000184649	0.00196334	6.3418E-07
CO2	0.0251596	1.58791E-05	7.2111E-05	0.000753464	1.62134E-06
Methane	36.2	0.00141298	0.0239754	0.25403	0.000175041
Ethane	1.2903	6.20542E-05	0.00107458	0.0113102	1.56431E-05
Propane	0.859367	2.862E-05	7.81956E-05	0.000817626	1.69752E-06
Isobutane	0.131108	2.37866E-06	8.31571E-06	8.64983E-05	2.27298E-07
n-Butane	0.587264	1.82708E-05	4.67878E-05	0.000484261	1.52882E-06
Isopentane	0.154791	2.8462E-06	3.22571E-05	0.000330214	1.43187E-06
n-Pentane	0.129091	1.39798E-06	4.63273E-05	0.000472562	2.23106E-06
i-Hexane	0.129494	6.02897E-07	0.00133729	0.0130973	0.000120658
Heptane	0.00336846	1.41394E-08	2.0096E-06	1.96576E-05	1.83821E-07
Octane	0.000373792	7.95747E-10	4.33432E-07	4.14581E-06	4.9366E-08
Nonane	1.01182E-05	1.23264E-11	2.44315E-08	2.25513E-07	3.62854E-09
n-Decane	7.47567E-07	3.15643E-13	4.02726E-09	3.53565E-08	7.86084E-10
n-Hexane	0.00877556	5.87831E-08	4.9209E-06	4.7746E-05	4.9042E-07
Benzene	0.218214	0.000609086	0.00218371	0.0183943	0.000506632
Toluene	0.0320398	6.9724E-05	0.000742732	0.00578786	0.000220787
Ethylbenzene	0.000899905	1.49999E-06	4.39059E-05	0.000311398	1.62325E-05
o-Xylene	0.00122309	3.10616E-06	9.41839E-05	0.00062805	3.89525E-05
MDEA	0.000106834	2.50656E-05	0.00483609	0.00158841	0.00517208
Piperazine	0.0103025	0.0193931	0.123061	0.343858	0.100219

Mass Fraction	68 %	69 %	70 %	71 %	72 %
H2S	0.00057403	1.1415E-06	2.28362E-08	1.06785E-06	1.36727E-09
H2O	58.0681	99.9024	2.12729	59.5249	0.948104
TEG	9.40622E-05	0.000181401	97.7804	39.1245	98.9854
N2	1.0792	2.13088E-05	3.9851E-05	0.00197346	1.26585E-07
CO2	0.0599767	3.87615E-05	2.44497E-05	0.00118981	5.08419E-07
Methane	31.4566	0.00125729	0.00296321	0.146225	2.00084E-05
Ethane	2.10156	0.000103495	0.000248934	0.0122028	3.35156E-06
Propane	2.05261	6.99994E-05	2.65646E-05	0.00129365	5.33352E-07
Isobutane	0.412767	7.66839E-06	3.72363E-06	0.000180392	9.41328E-08
n-Butane	1.84887	5.89018E-05	2.09508E-05	0.00100993	6.33142E-07
Isopentane	0.604934	1.139E-05	1.793E-05	0.000854854	7.36097E-07
n-Pentane	0.504495	5.59445E-06	2.57509E-05	0.00122336	1.14695E-06
i-Hexane	0.604455	2.88174E-06	0.00088784	0.0404978	7.40868E-05
Heptane	0.0182826	7.85844E-08	1.55136E-06	7.06764E-05	1.31242E-07
Octane	0.00231279	5.04172E-09	3.81436E-07	1.69923E-05	4.01795E-08
Nonane	7.02926E-05	8.7688E-11	2.41408E-08	1.0378E-06	3.31596E-09
n-Decane	5.76144E-06	2.491E-12	4.41453E-09	1.80504E-07	7.96931E-10
n-Hexane	0.0409628	2.80973E-07	3.26704E-06	0.000147634	3.0113E-07
Benzene	0.923278	0.00263891	0.00131413	0.0515548	0.000281976
Toluene	0.159905	0.00035633	0.000527228	0.0191349	0.000144949
Ethylbenzene	0.00517499	8.83282E-06	3.59112E-05	0.00118622	1.22792E-05

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	TEG Dehydration	

Mass Fraction	68 %	69 %	70 %	71 %	72 %
o-Xylene	0.00703348	1.82909E-05	7.70342E-05	0.00239245	2.94659E-05
MDEA	0.000689575	0.000165671	0.00443975	0.00679153	0.00439144
Piperazine	0.048068	0.0926527	0.081664	1.06275	0.0615085

Mass Flow	68 lb/h	69 lb/h	70 lb/h	71 lb/h	72 lb/h
H2S	0.00334835	3.45259E-06	2.69345E-06	2.53543E-06	1.58019E-07
H2O	338.714	302.165	250.906	141.331	109.574
TEG	0.00054867	0.000548665	11532.8	92.8943	11439.9
N2	6.29503	6.44507E-05	0.00470028	0.00468565	1.46296E-05
CO2	0.349847	0.000117238	0.00288375	0.00282499	5.8759E-05
Methane	183.488	0.00380281	0.349499	0.347187	0.00231241
Ethane	12.2585	0.000313031	0.0293608	0.0289734	0.000387346
Propane	11.973	0.00021172	0.0031332	0.00307156	6.16405E-05
Isobutane	2.40769	2.31938E-05	0.000439189	0.00042831	1.08791E-05
n-Butane	10.7846	0.000178154	0.00247107	0.00239789	7.31734E-05
Isopentane	3.52861	3.44501E-05	0.00211478	0.0020297	8.50721E-05
n-Pentane	2.94274	1.6921E-05	0.00303722	0.00290466	0.000132555
i-Hexane	3.52582	8.71611E-06	0.104717	0.0961551	0.00856236
Heptane	0.106644	2.37686E-07	0.000182977	0.000167809	1.51679E-05
Octane	0.0134906	1.52492E-08	4.49889E-05	4.03453E-05	4.64363E-06
Nonane	0.00041002	2.65221E-10	2.84731E-06	2.46408E-06	3.83232E-07
n-Decane	3.36068E-05	7.53429E-12	5.20678E-07	4.28575E-07	9.21029E-08
n-Hexane	0.238938	8.4983E-07	0.000385335	0.000350532	3.48022E-05
Benzene	5.38552	0.00798165	0.154996	0.122408	0.0325885
Toluene	0.932735	0.00107775	0.0621846	0.0454325	0.0167521
Ethylbenzene	0.030186	2.67157E-05	0.0042356	0.00281647	0.00141913
o-Xylene	0.0410267	5.53226E-05	0.0090859	0.00568047	0.00340543
MDEA	0.00402233	0.000501088	0.523652	0.0161253	0.507527
Piperazine	0.280383	0.280237	9.63196	2.52331	7.10865

Stream Properties

Property	Units	68	69	70	71	72
Temperature	°F	125 *	125	297.959	395	395
Pressure	psia	14.25	14.25	14.95	14.95	14.95
Molecular Weight	lb/lbmol	18.4616	18.029	129.8	27.8697	140.345
Mass Flow	lb/h	583.305	302.46	11794.6	237.433	11557.2
Std Vapor Volumetric Flow	MMSCFD	0.287761	0.152792	0.827589	0.0775913	0.749998
Std Liquid Volumetric Flow	sgpm	2.12591	0.604878	20.9427	0.457188	20.4855
Net Ideal Gas Heating Value	Btu/ft^3	418.03	0.659156	3196.65	289.334	3497.43
Gross Ideal Gas Heating Value	Btu/ft^3	491.649	51.0098	3502.06	362.442	3826.87

Remarks

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	TEG Dehydration	

Connections

	73	74	75	78	78A
From Block	AC-44300 LEAN/RICH EXCHANGER	MKUP-1	P-44170/P-44175 GLYCOL CIRULATION PUMPS	F-44100 TEG INLET FILTER COALESCER	LV1
To Block	MKUP-1	P-44170/P-44175 GLYCOL CIRULATION PUMPS	AC-44150 GAS/GLYCOL EXCHANGER	LV1	TEG Filter to Inlet

Stream Composition

Mole Fraction	73 %	74 %	75 %	78 %	78A %
H2S	6.81567E-12	0	0	0.0070475	0.0070475
H2O	0.991197	0.991154	0.991154	97.7934	97.7934
TEG	98.8884	98.8885	98.8885	0	0
N2	0.000503984	0.000503852	0.000503852	0.00140052	0.00140052
CO2	0.000131343	0.000131308	0.000131308	0.354805	0.354805
Methane	0.0567054	0.0566905	0.0566905	0.0789688	0.0789688
Ethane	0.00223944	0.00223885	0.00223885	0.0123386	0.0123386
Propane	0.000128281	0.000128247	0.000128247	0.00373363	0.00373363
Isobutane	9.75161E-06	9.74905E-06	9.74905E-06	0.000208821	0.000208821
n-Butane	4.07928E-05	4.07821E-05	4.07821E-05	0.000736282	0.000736282
Isopentane	3.46307E-05	3.46216E-05	3.46216E-05	4.63884E-05	4.63884E-05
n-Pentane	5.72853E-05	5.72703E-05	5.72703E-05	3.60707E-05	3.60707E-05
i-Hexane	0.00242272	0.00242208	0.00242208	2.72127E-06	2.72127E-06
Heptane	4.65544E-10	0	0	5.86102E-08	5.86102E-08
Octane	2.02674E-10	0	0	2.94003E-09	2.94003E-09
Nonane	2.75089E-11	0	0	1.71307E-11	1.71307E-11
n-Decane	1.11461E-11	0	0	2.5103E-13	2.5103E-13
n-Hexane	1.43303E-09	0	0	5.75576E-07	5.75576E-07
Benzene	1.06482E-05	1.06454E-05	1.06454E-05	0.000173851	0.000173851
Toluene	8.42179E-06	8.41958E-06	8.41958E-06	9.87219E-06	9.87219E-06
Ethylbenzene	1.06606E-06	1.06578E-06	1.06578E-06	1.2872E-07	1.2872E-07
o-Xylene	3.41328E-06	3.41239E-06	3.41239E-06	1.813E-07	1.813E-07
MDEA	0.00529583	0.00529444	0.00529444	0.394737	0.394737
Piperazine	0.0527874	0.0527735	0.0527735	1.35231	1.35231

Mass Fraction	73 %	74 %	75 %	78 %	78A %
H2S	1.56161E-12	0	0	0.0123611	0.0123611
H2O	0.120048	0.120043	0.120043	90.6698	90.6698
TEG	99.8369	99.8369	99.8369	0	0
N2	9.49154E-05	9.48905E-05	9.48905E-05	0.00201915	0.00201915
CO2	3.88604E-05	3.88502E-05	3.88502E-05	0.803615	0.803615
Methane	0.00611574	0.00611413	0.00611413	0.0651986	0.0651986
Ethane	0.000452703	0.000452584	0.000452584	0.019094	0.019094
Propane	3.80287E-05	3.80187E-05	3.80187E-05	0.00847302	0.00847302
Isobutane	3.81042E-06	3.80941E-06	3.80941E-06	0.000624638	0.000624638
n-Butane	1.59397E-05	1.59355E-05	1.59355E-05	0.00220241	0.00220241
Isopentane	1.67975E-05	1.6793E-05	1.6793E-05	0.000172247	0.000172247
n-Pentane	2.7786E-05	2.77787E-05	2.77787E-05	0.000133935	0.000133935
i-Hexane	0.00140359	0.00140322	0.00140322	1.20689E-05	1.20689E-05
Heptane	3.13611E-10	0	0	3.02246E-07	3.02246E-07
Octane	1.55642E-10	0	0	1.72838E-08	1.72838E-08
Nonane	2.37193E-11	0	0	1.13074E-10	1.13074E-10
n-Decane	1.06617E-11	0	0	1.83817E-12	1.83817E-12
n-Hexane	8.30217E-10	0	0	2.55269E-06	2.55269E-06
Benzene	5.59176E-06	5.59029E-06	5.59029E-06	0.000698885	0.000698885
Toluene	5.21674E-06	5.21537E-06	5.21537E-06	4.6813E-05	4.6813E-05
Ethylbenzene	7.60878E-07	7.60678E-07	7.60678E-07	7.03298E-07	7.03298E-07

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC
Location:	Titan Treater #2
Flowsheet:	TEG Dehydration
Job:	

Mass Fraction	73 %	74 %	75 %	78 %	78A %
o-Xylene	2.43617E-06	2.43553E-06	2.43553E-06	9.90582E-07	9.90582E-07
MDEA	0.00424254	0.00424143	0.00424143	2.4208	2.4208
Piperazine	0.030568	0.0305599	0.0305599	5.99473	5.99473

Mass Flow	73 lb/h	74 lb/h	75 lb/h	78 lb/h	78A lb/h
H2S	1.76342E-10	0	0	0	0
H2O	13.5562	13.5592	13.5592	0	0
TEG	11273.9	11276.9	11276.9	0	0
N2	0.0107181	0.0107181	0.0107181	0	0
CO2	0.00438823	0.00438823	0.00438823	0	0
Methane	0.690608	0.690608	0.690608	0	0
Ethane	0.0511206	0.0511206	0.0511206	0	0
Propane	0.00429431	0.00429431	0.00429431	0	0
Isobutane	0.000430284	0.000430284	0.000430284	0	0
n-Butane	0.00179996	0.00179996	0.00179996	0	0
Isopentane	0.00189682	0.00189682	0.00189682	0	0
n-Pentane	0.00313768	0.00313768	0.00313768	0	0
i-Hexane	0.158497	0.158497	0.158497	0	0
Heptane	3.54138E-08	0	0	0	0
Octane	1.75756E-08	0	0	0	0
Nonane	2.67846E-09	0	0	0	0
n-Decane	1.20395E-09	0	0	0	0
n-Hexane	9.37506E-08	0	0	0	0
Benzene	0.000631439	0.000631439	0.000631439	0	0
Toluene	0.00058909	0.00058909	0.00058909	0	0
Ethylbenzene	8.59206E-05	8.59206E-05	8.59206E-05	0	0
o-Xylene	0.0002751	0.0002751	0.0002751	0	0
MDEA	0.479081	0.479081	0.479081	0	0
Piperazine	3.45183	3.45183	3.45183	0	0

Stream Properties

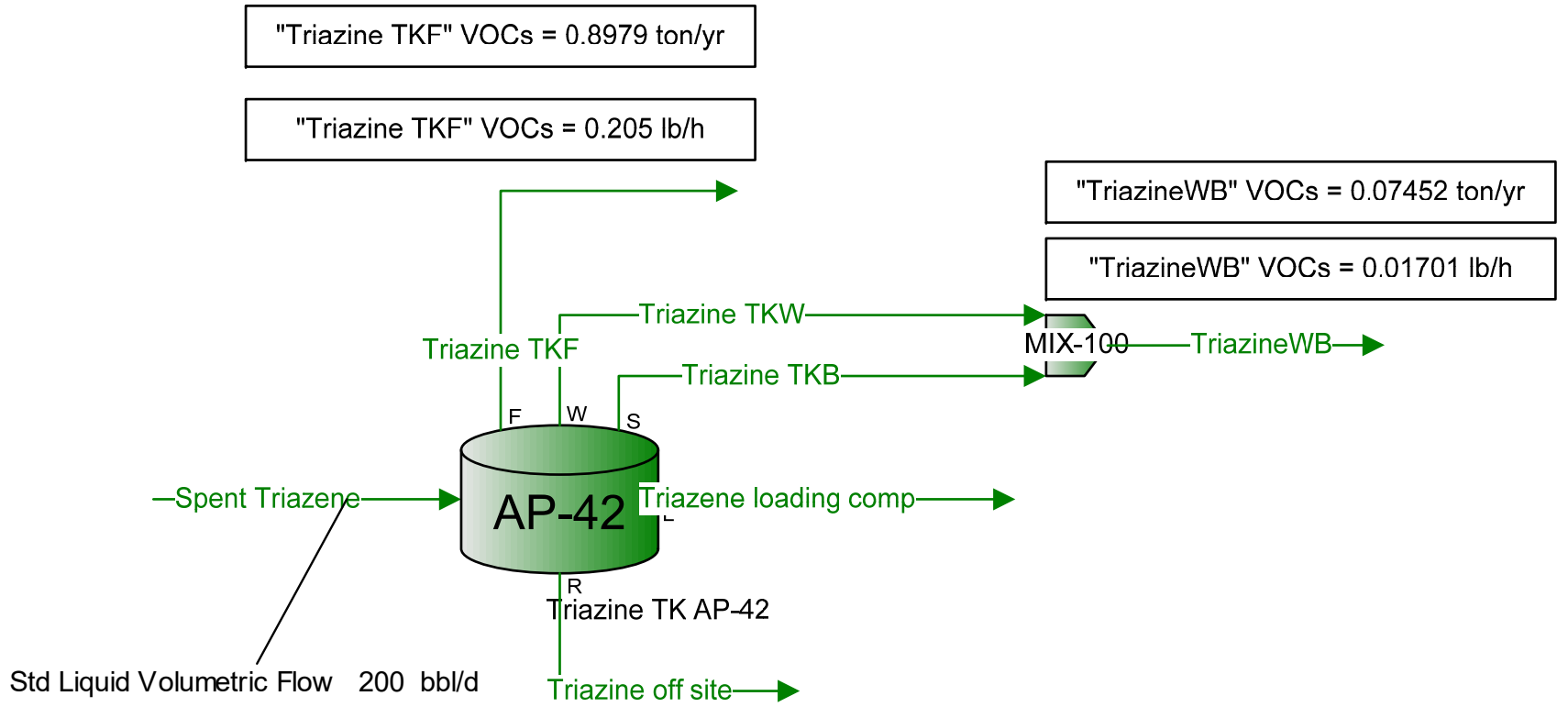
Property	Units	73	74	75	78	78A
Temperature	°F	201.254	201.228	204.626	119.882	
Pressure	psia	14.65	14.65	1213.25 *	1096.25	
Molecular Weight	lb/lbmol	148.746	148.746	148.746	19.4307	19.4307
Mass Flow	lb/h	11292.3	11295.3	11295.3	0	0
Std Vapor Volumetric Flow	MMSCFD	0.691419	0.691601	0.691601	0	0
Std Liquid Volumetric Flow	sgpm	19.9947	20 *	20	0	0
Net Ideal Gas Heating Value	Btu/ft^3	3737.56	3737.56	3737.56	58.2385	58.2385
Gross Ideal Gas Heating Value	Btu/ft^3	4086.19	4086.19	4086.19	112.238	112.238

Remarks

Triazine
Plant Schematic

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	Triazine	

Triazine Tank



* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	Triazine	

Connections

	Spent Triazene	Triazene loading comp	Triazine off site	Triazine TKB	Triazine TKF
From Block	--	Triazine TK AP-42	Triazine TK AP-42	Triazine TK AP-42	Triazine TK AP-42
To Block	Triazine TK AP-42	--	--	MIX-100	--

Stream Composition

Mole Fraction	Spent Triazene %		Triazene loading comp %	Triazine off site %	Triazine TKB %	Triazine TKF %
H2S	1.3E-06	*	0.00288905	7.09421E-07	0.000912108	0.000283421
H2O	96.0025	*	37.2141	96.1479	9.51209	3.55141
TEG	0	*	0	0	0	0
N2	0.00129048	*	0	0	0.06416	0.939595
CO2	0.0516391	*	62.6491	0.00437159	73.3221	22.5691
Methane	0.0882726	*	0	0	12.3738	62.9378
Ethane	0.0106339	*	0	0	3.40308	7.26257
Propane	0.00307114	*	0	0	0.974832	2.0988
Isobutane	0.000193071	*	0	0	0.0503394	0.133772
n-Butane	0.000634234	*	0	0	0.239164	0.427114
Isopentane	4.7E-05	*	0	0	0.0151438	0.0320821
n-Pentane	4.9E-05	*	0	0	0.00893907	0.034591
i-Hexane	0	*	0	0	0	0
Heptane	1E-06	*	0	0	0.000146091	0.000712006
Octane	0	*	0	0	0	0
Nonane	0	*	0	0	0	0
n-Decane	0	*	0	0	0	0
n-Hexane	0	*	0	0	0	0
Benzene	1.3E-05	*	0.00736283	1.17011E-05	0.00192612	0.000648553
Toluene	0	*	0	0	0	0
Ethylbenzene	0.000196072	*	0.104817	0.000177145	0.0276897	0.00952042
o-Xylene	6.2E-05	*	0.0217755	5.81528E-05	0.00568413	0.00195179
Triazine, MEA	3.84142	*	1.67473E-13	3.84752	5.72398E-14	5.29989E-14
Piperazine	5E-06	*	2.57281E-09	5.00794E-06	7.12796E-10	3.4623E-10

Mass Fraction	Spent Triazene %		Triazene loading comp %	Triazine off site %	Triazine TKB %	Triazine TKF %
H2S	1.71984E-06	*	0.00286085	9.38561E-07	0.000825389	0.000395398
H2O	67.1361	*	19.4795	67.2401	4.55008	2.61898
TEG	0	*	0	0	0	0
N2	0.00140329	*	0	0	0.0477235	1.07745
CO2	0.0882181	*	80.1105	0.0074685	85.6808	40.6585
Methane	0.0549705	*	0	0	5.27079	41.3308
Ethane	0.0124121	*	0	0	2.71703	8.93924
Propane	0.00525687	*	0	0	1.14137	3.78842
Isobutane	0.000435604	*	0	0	0.0776877	0.318271
n-Butane	0.00143095	*	0	0	0.369096	1.01619
Isopentane	0.000131631	*	0	0	0.0290112	0.0947505
n-Pentane	0.000137233	*	0	0	0.0171247	0.10216
i-Hexane	0	*	0	0	0	0
Heptane	3.88964E-06	*	0	0	0.00038869	0.00292045
Octane	0	*	0	0	0	0
Nonane	0	*	0	0	0	0
n-Decane	0	*	0	0	0	0
n-Hexane	0	*	0	0	0	0
Benzene	3.94179E-05	*	0.0167105	3.54805E-05	0.00399487	0.00207373
Toluene	0	*	0	0	0	0
Ethylbenzene	0.000808034	*	0.323325	0.000730061	0.0780553	0.0413741
o-Xylene	0.000255509	*	0.0671703	0.000239662	0.0160231	0.00848213

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	Triazine	

Mass Fraction	Spent Triazene %		Triazene loading comp %	Triazine off site %	Triazine TKB %	Triazine TKF %
Triazine, MEA	32.6984	*	1.06702E-12	32.7514	3.33274E-13	4.75729E-13
Piperazine	1.6718E-05	*	6.439E-09	1.67452E-05	1.63024E-09	1.22078E-09

Mass Flow	Spent Triazene lb/h		Triazene loading comp lb/h	Triazine off site lb/h	Triazine TKB lb/h	Triazine TKF lb/h
H2S	5.09418E-05	*	3.4488E-06	2.77553E-05	1.26069E-06	1.50817E-05
H2O	1988.58	*	0.0234828	1988.44	0.00694974	0.0998959
TEG	0	*	0	0	0	0
N2	0.0415658	*	0	0	7.28923E-05	0.0410972
CO2	2.61304	*	0.0965746	0.22086	0.130868	1.55084
Methane	1.62824	*	0	0	0.00805054	1.57648
Ethane	0.367649	*	0	0	0.00414996	0.34097
Propane	0.155709	*	0	0	0.00174332	0.144502
Isobutane	0.0129027	*	0	0	0.000118659	0.0121398
n-Butane	0.042385	*	0	0	0.000563753	0.0387607
Isopentane	0.00389895	*	0	0	4.43114E-05	0.00361407
n-Pentane	0.00406486	*	0	0	2.61561E-05	0.0038967
i-Hexane	0	*	0	0	0	0
Heptane	0.000115212	*	0	0	5.9368E-07	0.000111395
Octane	0	*	0	0	0	0
Nonane	0	*	0	0	0	0
n-Decane	0	*	0	0	0	0
n-Hexane	0	*	0	0	0	0
Benzene	0.00116756	*	2.01448E-05	0.00104924	6.10172E-06	7.90985E-05
Toluene	0	*	0	0	0	0
Ethylbenzene	0.0239341	*	0.000389774	0.0215895	0.000119221	0.00157813
o-Xylene	0.00756822	*	8.0975E-05	0.00708734	2.44736E-05	0.000323534
Triazine, MEA	968.532	*	1.28632E-15	968.532	5.0904E-16	1.81457E-14
Piperazine	0.000495192	*	7.76233E-12	0.000495191	2.49E-12	4.65643E-11

Stream Properties

Property	Units	Spent Triazene		Triazene loading comp	Triazine off site	Triazine TKB	Triazine TKF
Temperature	°F	114.5	*	77.2706	77.2706	77.2706	77.2706
Pressure	psia	15.1959	*	13.26	13.26	13.26	13.26
Molecular Weight	lb/lbmol	25.7613		34.4169	25.7604	37.6615	24.4292
Mass Flow	lb/h	2962.02		0.120552	2957.22	0.152739	3.8143
Std Vapor Volumetric Flow	MMSCFD	1.04719		3.19012E-05	1.04553	3.69366E-05	0.00142204
Std Liquid Volumetric Flow	sgpm	5.83333	*	0.000284329	5.81333	0.00042097	0.0172925
Net Ideal Gas Heating Value	Btu/ft^3	248.785		6.57141	248.103	201.534	758.498
Gross Ideal Gas Heating Value	Btu/ft^3	317.47		25.6244	316.78	226.744	840.41

Remarks

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	Triazine	

Connections

	Triazine TKW	TriazineWB			
From Block	Triazine TK AP-42	MIX-100			
To Block	MIX-100	--			

Stream Composition

Mole Fraction	Triazine TKW %	TriazineWB %			
H2S	0.000912108	0.000912108			
H2O	9.51209	9.51209			
TEG	0	0			
N2	0.06416	0.06416			
CO2	73.3221	73.3221			
Methane	12.3738	12.3738			
Ethane	3.40308	3.40308			
Propane	0.974832	0.974832			
Isobutane	0.0503394	0.0503394			
n-Butane	0.239164	0.239164			
Isopentane	0.0151438	0.0151438			
n-Pentane	0.00893907	0.00893907			
i-Hexane	0	0			
Heptane	0.000146091	0.000146091			
Octane	0	0			
Nonane	0	0			
n-Decane	0	0			
n-Hexane	0	0			
Benzene	0.00192612	0.00192612			
Toluene	0	0			
Ethylbenzene	0.0276897	0.0276897			
o-Xylene	0.00568413	0.00568413			
Triazine, MEA	5.72398E-14	5.72398E-14			
Piperazine	7.12796E-10	7.12796E-10			

Mass Fraction	Triazine TKW %	TriazineWB %			
H2S	0.000825389	0.000825389			
H2O	4.55008	4.55008			
TEG	0	0			
N2	0.0477235	0.0477235			
CO2	85.6808	85.6808			
Methane	5.27079	5.27079			
Ethane	2.71703	2.71703			
Propane	1.14137	1.14137			
Isobutane	0.0776877	0.0776877			
n-Butane	0.369096	0.369096			
Isopentane	0.0290112	0.0290112			
n-Pentane	0.0171247	0.0171247			
i-Hexane	0	0			
Heptane	0.00038869	0.00038869			
Octane	0	0			
Nonane	0	0			
n-Decane	0	0			
n-Hexane	0	0			
Benzene	0.00399487	0.00399487			
Toluene	0	0			
Ethylbenzene	0.0780553	0.0780553			
o-Xylene	0.0160231	0.0160231			
Triazine, MEA	3.33274E-13	3.33274E-13			
Piperazine	1.63024E-09	1.63024E-09			

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Northwind Midstream Partners, LLC	Job:
Location:	Titan Treater #2	
Flowsheet:	Triazine	

Mass Flow	Triazine TKW lb/h	TriazineWB lb/h			
H2S	6.84416E-06	8.10485E-06			
H2O	0.0377294	0.0446791			
TEG	0	0			
N2	0.000395725	0.000468617			
CO2	0.710468	0.841336			
Methane	0.0437055	0.0517561			
Ethane	0.0225297	0.0266796			
Propane	0.0094643	0.0112076			
Isobutane	0.000644189	0.000762849			
n-Butane	0.00306056	0.00362431			
Isopentane	0.000240562	0.000284874			
n-Pentane	0.000141999	0.000168155			
i-Hexane	0	0			
Heptane	3.22303E-06	3.81671E-06			
Octane	0	0			
Nonane	0	0			
n-Decane	0	0			
n-Hexane	0	0			
Benzene	3.31256E-05	3.92273E-05			
Toluene	0	0			
Ethylbenzene	0.000647237	0.000766458			
o-Xylene	0.000132864	0.000157338			
Triazine, MEA	2.76352E-15	3.27256E-15			
Piperazine	1.3518E-11	1.6008E-11			

Stream Properties

Property	Units	Triazine TKW	TriazineWB			
Temperature	°F	77.2706	77.2706			
Pressure	psia	13.26	13.26			
Molecular Weight	lb/lbmol	37.6615	37.6615			
Mass Flow	lb/h	0.829203	0.981942			
Std Vapor Volumetric Flow	MMSCFD	0.000200525	0.000237461			
Std Liquid Volumetric Flow	sgpm	0.0022854	0.00270637			
Net Ideal Gas Heating Value	Btu/ft^3	201.534	201.534			
Gross Ideal Gas Heating Value	Btu/ft^3	226.744	226.744			

Remarks

Blocks
Triazine TK AP-42
Tank Losses

Client Name:	Northwind Midstream Partners, LLC	Job:	
Location:	Titan Treater #2	Modified: 7:35 AM, 11/25/2024	
Flowsheet:	Triazine	Status: Solved 9:10 AM, 12/10/2024	

Connections

Stream	Connection Type	Other Block	Stream	Connection Type	Other Block
Spent Triazene	Inlet		Triazine TKF	Flashing Losses Stream	
Triazine TKW	Working Losses Stream	MIX-100	Triazine TKB	Standing Losses Stream	MIX-100
Triazene loading comp	Loading Losses Stream		Triazine off site	Residual Liquid Stream	

Working and Standing Properties

	Tank Geometry	Vertical Cylinder		Roof Type	Cone
*	Shell Length	20 ft		Slope of Coned Roof	0.0625
*	Shell Diameter	12 ft		Breather Vent Pressure	0.03 psi
	Number of Storage Tanks	1		Breather Vacuum Pressure	-0.03 psi
	Maximum Fraction Fill of Tank	90 %	*	Location	Midland, TX
	Average Fraction Fill of Tank	50 %		Time Frame	Year
	Minimum Fraction Fill of Tank	10 %		Known Liquid Bulk Temperature?	False
*	Material Category	Heavy Crude		Liquid Bulk Temperature	66.5461 °F
	Insulation	Uninsulated		Use AP 42 Raoult's Vapor Pressure?	False
	Bolted or Riveted Construction?	False		Flashing Temperature	77.2706 °F
	Vapor Balanced Tank?	False		Average Daily Maximum Ambient Temperature	76.7 °F
	Known Sum of Increases in Liquid Level?	False		Average Daily Minimum Ambient Temperature	51.4 °F
	Sum of Increases in Liquid Level	3490.22 ft/yr		Atmospheric Pressure at Tank Location	13.26 psia
*	Shell Color	Tan		Daily Solar Insolation	1698 Btu/(day*ft^2)
	Shell Paint Condition	Average		Average Wind Speed	11 mph
*	Roof Color	Tan		Include Short Term Emissions	False
	Roof Paint Condition	Average			

Composition Subset Properties

Component Subset	VOCs	Species in Results	Selected Species
Atomic Basis	False	Fraction Denominator	Selected Species

Tabulated Composition Subset Properties

Index	Selected Components			
H2S	False			
H2O	False			
TEG	True			
N2	False			
CO2	False			
Methane	False			
Ethane	False			
Propane	True			
Isobutane	True			
n-Butane	True			
Isopentane	True			
n-Pentane	True			
i-Hexane	True			
Heptane	True			
Octane	True			
Nonane	True			
n-Decane	True			
n-Hexane	True			
Benzene	True			
Toluene	True			

Blocks
Triazine TK AP-42
Tank Losses

Client Name:	Northwind Midstream Partners, LLC	Job:	
Location:	Titan Treater #2	Modified: 7:35 AM, 11/25/2024	
Flowsheet:	Triazine	Status: Solved 9:10 AM, 12/10/2024	

Tabulated Composition Subset Properties

Index	Selected Components			
Ethylbenzene	True			
o-Xylene	True			
Triazine, MEA	True			
Piperazine	True			

Details Properties

Vapor Space Volume	1145.11	ft^3	Roof Outage	0.125	ft
Vapor Density	0.0527739	lb/ft^3	Tank Roof Height	0.375	ft
Vapor Space Expansion Factor	1	1/day	Tank Shell Radius	6	ft
Vented Vapor Saturation Factor	0.130471		Vapor Molecular Weight	24.1899	lb/lbmol
Vapor Space Outage	10.125	ft	Average Vapor Temperature	530.456	°R
Average Daily Vapor Temperature Range	34.4184	°R	Average Daily Ambient Temperature	523.72	°R
Average Daily Vapor Pressure Range	1.65681	psi	Net Working Loss Throughput	394735	ft^3/yr
Breather Vent Pressure Setting Range	0.06	psi	Working Loss Turnover (Saturation) Factor	1	
Vapor Pressure at Average Daily Liquid Surface Temperature	12.4193	psia	Number of Turnovers per Year	218.139	
Average Daily Liquid Surface Temperature	528.336	°R	Annual Net Throughput	70312.6	bbl/yr
Average Daily Ambient Temperature Range	25.3	°R	Maximum Liquid Height	18	ft
Tank Roof Surface Solar Absorptance	0.49		Minimum Liquid Height	2	ft
Tank Shell Surface Solar Absorptance	0.49		Working Loss Product Factor	0.75	
Vapor Pressure at Maximum Liquid Surface Temperature	13.26	psia	Vent Setting Correction Factor	1	
Vapor Pressure at Minimum Liquid Surface Temperature	11.6032	psia	Saturation Factor	0.5	
Maximum Liquid Surface Temperature	536.941	°R	Vapor Pressure of Liquid Loaded	0.877606	psia
Minimum Liquid Surface Temperature	519.731	°R	Collection Efficiency	70	%
Liquid Height	10	ft	Annual Net Throughput Per Tank	70312.6	bbl/yr

Loading Properties

Cargo Carrier	Tank Truck or Rail Tank Car		Truck Annual Leak Test Passed	None	
Land Based Mode of Operation	Submerged Loading of a Clean Cargo Tank		Overall Reduction Efficiency	0	%
* Control Efficiency	0	%			

Results Properties

Flashing Losses	0.897923	ton/yr	Standing Losses per Tank	0.0115921	ton/yr
Working Losses	0.0629321	ton/yr	Flashing Losses per Tank	0.897923	ton/yr
Standing Losses	0.0115921	ton/yr	Working and Standing Losses	0.0745242	ton/yr
Loading Losses	0.00215012	ton/yr	Working and Standing Losses per Tank	0.0745242	ton/yr
Working Losses per Tank	0.0629321	ton/yr	Loading Losses per Tank	0.00215012	ton/yr

Blocks
Triazine TK AP-42
Tank Losses

Client Name:	Northwind Midstream Partners, LLC	Job:	
Location:	Titan Treater #2	Modified: 7:35 AM, 11/25/2024	
Flowsheet:	Triazine	Status: Solved 9:10 AM, 12/10/2024	

Tabulated Results Properties

Index	Flashing Losses Mass Flows ton/yr	Working Losses Mass Flows ton/yr	Standing Losses Mass Flows ton/yr	Loading Losses Mass Flows ton/yr
TEG	0	0	0	0
Propane	0.632918	0.0414536	0.00763574	0
Isobutane	0.0531724	0.00282155	0.000519728	0
n-Butane	0.169772	0.0134052	0.00246924	0
Isopentane	0.0158296	0.00105366	0.000194084	0
n-Pentane	0.0170676	0.000621955	0.000114564	0
i-Hexane	0	0	0	0
Heptane	0.00048791	1.41169E-05	2.60032E-06	0
Octane	0	0	0	0
Nonane	0	0	0	0
n-Decane	0	0	0	0
n-Hexane	0	0	0	0
Benzene	0.000346451	0.00014509	2.67255E-05	8.82344E-05
Toluene	0	0	0	0
Ethylbenzene	0.00691222	0.0028349	0.000522187	0.00170721
o-Xylene	0.00141708	0.000581946	0.000107194	0.00035467
Triazine, MEA	7.94783E-14	1.21042E-14	2.22959E-15	5.63406E-15
Piperazine	2.03952E-10	5.92087E-11	1.09062E-11	3.3999E-11

Index	Working and Standing Losses Mass Flows ton/yr			
TEG	0			
Propane	0.0490894			
Isobutane	0.00334128			
n-Butane	0.0158745			
Isopentane	0.00124775			
n-Pentane	0.000736518			
i-Hexane	0			
Heptane	1.67172E-05			
Octane	0			
Nonane	0			
n-Decane	0			
n-Hexane	0			
Benzene	0.000171816			
Toluene	0			
Ethylbenzene	0.00335708			
o-Xylene	0.00068914			
Triazine, MEA	1.43338E-14			
Piperazine	7.01149E-11			

Warnings

ProMax:ProMax!Project!Flowsheets!Triazine!Blocks!Triazine TK AP-42

Warning: Vapor adjusted to ensure mass balance.

Remarks

Inlet Gas Analysis

Midland Laboratory
2200 East I-20
Midland, TX 79706
Phone 432-689-7252

Certificate of Analysis

Number: 5030-23070671-001A

Aug. 16, 2023

Station Name: MTDR UNCLE RICHARD
Sample Point: SEP
Cylinder No: 5030-00259
Analyzed: 08/02/2023 10:23:42 by CDW

Sampled By: JOSUE J
Sample Of: Gas Spot
Sample Date: 07/25/2023 09:50
Sample Conditions: 95 psig, @ 112 °F
Method: GPA 2286

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.73 psia		
Hydrogen Sulfide	0.000	0.000		GPM TOTAL C2+	8.639
Nitrogen	1.843	2.078		GPM TOTAL C3+	4.792
Methane	66.415	42.874		GPM TOTAL iC5+	1.153
Carbon Dioxide	1.858	3.291			
Ethane	14.316	17.322	3.847		
Propane	8.508	15.097	2.355		
Iso-butane	1.121	2.622	0.369		
n-Butane	2.888	6.755	0.915		
Iso-pentane	0.810	2.352	0.298		
n-Pentane	0.781	2.268	0.285		
Hexanes Plus	1.460	5.341	0.570		
	100.000	100.000	8.639		

Calculated Physical Properties	**Total**	**C6+**
Relative Density Real Gas	0.8618	3.1263
Calculated Molecular Weight	24.85	90.54
Compressibility Factor	0.9950	
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.73 psia & 60°F		
Real Gas Dry BTU	1413	4821
Water Sat. Gas Base BTU	1389	4737

Comments: H2S Field Content 0.8 ppm

Data reviewed by: Raymond Bradford, Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

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Analytical Data

Components	Mol. %	Wt. %	GPM at 14.73 psia		
Hydrogen Sulfide	0.000	0.000		GPM TOTAL C2+	8.6390
Nitrogen	1.843	2.078		GPM TOTAL C3+	4.7920
Methane	66.415	42.874		GPM TOTAL iC5+	1.1530
Carbon Dioxide	1.858	3.291			
Ethane	14.316	17.322	3.847		
Propane	8.508	15.097	2.355		
Iso-Butane	1.121	2.622	0.369		
n-Butane	2.888	6.755	0.915		
Iso-Pentane	0.810	2.352	0.298		
n-Pentane	0.781	2.268	0.285		
Hexanes	0.543	1.838	0.217		
Heptanes Plus	0.917	3.503	0.353		
	100.000	100.000	8.639		

Calculated Physical Properties	Total	C7+
Relative Density Real Gas	0.8618	3.2365
Calculated Molecular Weight	24.85	93.74
Compressibility Factor	0.9950	
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.73 psia & 60°F		
Real Gas Dry BTU	1413.1	4895.0
Water Sat. Gas Base BTU	1388.5	4821.0

Comments: H2S Field Content 0.8 ppm

Data reviewed by: Raymond Bradford, Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

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Analytical Data

Components	Mol. %	Wt. %	GPM at 14.73 psia
Hydrogen Sulfide	0.000	0.000	
Nitrogen	1.843	2.078	
Methane	66.415	42.874	
Carbon Dioxide	1.858	3.291	
Ethane	14.316	17.322	3.847
Propane	8.508	15.097	2.355
Iso-Butane	1.121	2.622	0.369
n-Butane	2.888	6.755	0.915
Iso-Pentane	0.810	2.352	0.298
n-Pentane	0.781	2.268	0.285
i-Hexanes	0.348	1.167	0.138
n-Hexane	0.195	0.671	0.079
Benzene	0.152	0.477	0.042
Cyclohexane	0.143	0.479	0.048
i-Heptanes	0.224	0.838	0.090
n-Heptane	0.056	0.227	0.026
Toluene	0.102	0.375	0.034
i-Octanes	0.147	0.625	0.066
n-Octane	0.019	0.088	0.010
Ethylbenzene	0.013	0.056	0.005
Xylenes	0.021	0.086	0.008
i-Nonanes	0.026	0.147	0.015
n-Nonane	0.005	0.027	0.003
Decane Plus	0.009	0.078	0.006
	100.000	100.000	8.639

GPM TOTAL C2+ 8.639

Calculated Physical Properties	Total	C10+
Relative Density Real Gas	0.8618	4.3506
Calculated Molecular Weight	24.85	126.01
Compressibility Factor	0.9950	
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.73 psia & 60°F		
Real Gas Dry BTU	1413.1	6597.0
Water Sat. Gas Base BTU	1388.5	6449.9

Comments: H2S Field Content 0.8 ppm

Data reviewed by: Raymond Bradford, Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

Heater Specifications

OPTIMIZED PROCESS FURNACES, INC

OPTIMIZED PROCESS FURNACES, INC.
PROPOSAL NO 2024-025-1 REV 2
12/17/2024

PURCHASER / OWNER: AZOTA / NORTHWIND MIDSTREAM **ITEM NO: HT-49200/59200** HOH-1 & HOH-2
SERVICE: HOT OIL HEATER **LOCATION: JAL, NEW MEXICO**

												REV
1	UNIT:			NUMBER REQUIRED: 2								
2	MANUFACTURER: OPTIMIZED PROCESS FURNACES, INC.			REFERENCE: 2024-025-1 REV 2								
3	TYPE OF HEATER: VERTICAL CYLINDRICAL, NATURAL DRAFT											
4	TOTAL HEATER ABSORBED DUTY, MM Btu/hr.:											
5	**PROCESS DESIGN CONDITIONS**											
6	* OPERATING CASE	RATED		NORMAL								
7	HEATER SECTION	RAD + CONV		RAD + CONV								
8	SERVICE	HOT OIL		HOT OIL								
9	HEAT ABSORPTION, MM Btu/hr.	100.00		93.50								
10	FLUID	CEMTHERM 550		CEMTHERM 550								
11	FLOW RATE, Lb/hr.	2,238,220		2,088,000								
12	FLOW RATE, B.P.D.	-		-								
13	PRESSURE DROP, ALLOWABLE (CLEAN / FOULED), Psi.	-	-	30	-							
14	PRESSURE DROP, CALCULATED (CLEAN / FOULED), Psi.	30	-	25	-							
15	AVG. RAD. SECT. FLUX DENSITY, ALLOWABLE, Btu/hr-ft^2.	-		-								
16	AVG. RAD. SECT. FLUX DENSITY, CALCULATED, Btu/hr-ft^2.	12,380		11,730								
17	MAX. RAD. SECT. FLUX DENSITY, Btu/hr-ft^2.	22,130		20,960								
18	CONV. SECT. FLUX DENSITY, (BARE TUBE), Btu/hr-ft^2.	17,650		16,070								
19	VELOCITY LIMITATION, ft/s.	-		-								
20	PROCESS FLUID MASS VELOCITY, Lb/sec-ft^2.	620		578								
21	MAXIMUM ALLOW. / CALC. INSIDE FILM TEMPERATURE, °F.	625	488	625	483							
22	FOULING FACTOR, hr-ft^2-°F/Btu.	0.002		0.002								
23	COKING ALLOWANCE, in.	-		-								
24	**INLET CONDITIONS**											
25	TEMPERATURE, °F.	325		325								
26	PRESSURE, (Psig)	95		90								
27	LIQUID FLOW, Lb/hr.	2,238,220		2,088,000								
28	VAPOR FLOW, Lb/hr.	-		-								
29	DENSITY (LIQUID / VAPOR), Lb/ft^3	50.4	-	50.4	-							
30	VAPOR MOLECULAR WEIGHT	-		-								
31	VISCOSITY, (LIQUID / VAPOR), cP.	1.327	-	1.327	-							
32	SPECIFIC HEAT, (LIQUID / VAPOR), Btu/Lb-°F.	0.579	-	0.579	-							
33	THERMAL CONDUCTIVITY, (LIQUID / VAPOR), Btu/hr-ft-°F.	0.0706	-	0.0706	-							
34	**OUTLET CONDITIONS**											
35	TEMPERATURE, °F.	400		400								
36	PRESSURE, (Psig)	65		65								
37	LIQUID FLOW, Lb/hr.	2,238,220		2,088,000								
38	VAPOR FLOW, Lb/hr.	-		-								
39	DENSITY (LIQUID / VAPOR), Lb/ft^3	48.8	-	48.8	-							
40	VAPOR MOLECULAR WEIGHT	-		-								
41	VISCOSITY, (LIQUID / VAPOR), cP.	0.921	-	0.921	-							
42	SPECIFIC HEAT, (LIQUID / VAPOR), Btu/Lb-°F.	0.615	-	0.615	-							
43	THERMAL CONDUCTIVITY, (LIQUID / VAPOR), Btu/hr-ft-°F.	0.0653	-	0.0653	-							
44	**REMARKS AND SPECIAL REQUIREMENTS:**											
45	DISTILLATION DATA OR FEED COMPOSITION:											
46	SHORT TERM OPERATING CONDITIONS:											
47												
48	NOTES:											
49												
50												
51												
52												
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FIRED HEATER DATA SHEET **API STD 560**	**CUSTOMARY UNITS**			
	PROJECT NUMBER	DOCUMENT NUMBER	SHEET	REV
			1 OF 6	2

COMBUSTION DESIGN CONDITIONS

						REV
1	* OPERATING CASE	RATED	NORMAL			
2	* TYPE OF FUEL	NATURAL GAS	NATURAL GAS			
3	* EXCESS AIR, %	15	15			
4	CALCULATED HEAT RELEASE (LHV), MM Btu/hr.	117.71	109.20			
5	FUEL EFFICIENCY CALCULATED, % (LHV)	85	85.5			
6	FUEL EFFICIENCY GUARANTEED, % (LHV)	84	-			
7	RADIATION LOSS, PERCENT OF HEAT RELEASE (LHV)	1.5	1.5			
8	FLUE GAS TEMPERATURE LEAVING: RADIANT SECTION, °F.	1657	1619			
9	CONVECTION SECTION, °F.	571	550			
10	AIR PREHEATER, °F.	-	-			
11	FLUE GAS QUANTITY, Lb/hr.	114,304	106,020			
12	FLUE GAS MASS VELOCITY THRU CONV. SECTION, Lb/sec-ft^2.	0.43	0.04			
13	DRAFT: AT ARCH, in-H_2O.	0.10	0.10			
14	AT BURNERS, in-H_2O.	0.49	0.49			
15	AMBIENT AIR TEMPERATURE, EFFICIENCY CALCULATION, °F.	60	60			
16	* AMBIENT AIR TEMPERATURE, STACK DESIGN, °F.	90	90			
17	* ALTITUDE ABOVE SEA LEVEL, ft.	2900 (13.22 psia)	2900 (13.22 psia)			
18	VOLUMETRIC HEAT RELEASE (LHV), Btu/hr-ft^3.	6839	6344			

FUEL CHARACTERISTICS

20	* GAS TYPE	NATURAL GAS	* LIQUID TYPE		* OTHER TYPE		
21	* LHV,	Btu/(Lb) (Scf).	* LHV		* LHV,	Btu/(Lb) (Scf)	
22	* HHV,	Btu/(Lb) (Scf).	* HHV,	Btu/Lb.	* HHV,	Btu/(Lb) (Scf)	
23	* PRESS. @ BURNER,	20 Psig.	* PRESS. @ BURNER,	Psig.	* PRESS. @ BURNER,	Psig	
24	TEMP. @ BURNER,	80 °F.	* TEMP. @ BURNER,	°F.	* TEMP. @ BURNER,	°F.	
25	* MOLECULAR WEIGHT		* VISCOSITY @	SSU.	* MOLECULAR WEIGHT		
26			* ATOMIZING STEAM TEMI	°F	* COMPOSITION	MOLE %	
27	COMPOSITION	MOLE %	* ATOMIZING STEAM PRES	Psig.			
28	NITROGEN	2.6557	*COMPOSITION	WT%			
29	CO2	0.013					
30	H2S	0					
31	METHANE	89.965					
32	ETHANE	5.8188					
33	PROPANE	1.3558					
34	i-BUTANE /n-BUTANE	0.0678 / 0.0948	* VANADIUM (PPM)				
35	i-PENTANE / n-PENTANE	0.0048 / 0.0036	* SODIUM (PPM)				
36	HEXANE	0.0207	* SULFUR				
37			* ASH				

BURNER DATA:

39	MANUFACTURER:		SIZE / MODEL:		NUMBER:	8	
40	TYPE:	ULTRA LOW NOx	LOCATION:	FLOOR	ORIENTATION:	VERTICAL	2
41	HEAT RELEASE PER BURNER, MM Btu/hr.		BURNER DESIGN: 16.19	HEATER DESIGN: 14.71	MINIMUM: 4.05		
42	PRESSURE DROP ACROSS BURNER @ DESIGN HEAT RELEASE, in H_20: 0.49						
43	DISTANCE BURNER CENTER LINE TO TUBE CENTER LINE, ft.			VERTICAL: 46.15	HORIZONTAL: 6.21		
44	DISTANCE BURNER CENTER LINE TO UNSHIELDED REFRACTORY, ft.			VERTICAL: 44.15	HORIZONTAL: -		
45	* PILOT, TYPE:	GAS	CAPACITY, BTU / HR: 90,000				
46	* IGNITION METHOD:	MANUAL					
47	* FLAME SCANNERS, LOCATION:	NONE	SCANNER QUANTITY: 0				
48	REQUIRED EMISSIONS:	ppmv(d) (CORRECTED TO 3% 02)		NOx: NOTE 1	CO: NOTE 2	SOx:	2
49		Lb/ MM Btu (LHV) (HHV)		UHC:	PARTICULATES:		

50 NOTES:

51 1. NOx Emissions: 30 ppm // 0.036 lb/MMBtu (HHV) (Dry, corrected to 3% O2) when operating 60%-100% of Burner Design Heat Release — 2

52 2. CO Emissions: 20 ppm // 0.015 lb/MMBtu (HHV) (Dry, corrected to 3% O2) when firebox > 1200°F — 2

53 3. Pollutant emissions are guaranteed in the following conditions: - Single Burner HR is in the range 60% - 100% of Max Burner HR. — 2

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FIRED HEATER DATA SHEET
API STD 560

CUSTOMARY UNITS

PROJECT NUMBER	DOCUMENT NUMBER	SHEET	REV
		2 OF 6	2

MECHANICAL DESIGN CONDITIONS

1	* PLOT LIMITATIONS:		* STACK LIMITATIONS:			REV
2	* TUBE LIMITATIONS:		* NOISE LIMITATIONS:			
3	* STRUCTURAL DESIGN DATA: WIND VELOCITY: 112 MPH		*WIND OCCURRENCE: ASCE CAT III			
4	SNOW LOAD:		* SEISMIC ZONE: ASCE CAT A, CLASS D			
5	* MIN./ NORMAL / MAX. AMBIENT AIR TEMPERATURE, °F: 0 / 60 / 110		* RELATIVE HUMIDITY, %: 60			
6	HEATER SECTION:	RADIANT	SHOCK	CONVECTION	CONVECTION	
7	SERVICE:	HOT OIL	HOT OIL	HOT OIL	HOT OIL	
8	**COIL DESIGN:**					
9	* DESIGN BASIS: TUBE WALL THICKNESS (CODE OR SPECIFICATION):	API RP 530 / ASME SECT VIII				
10	RUPTURE STRENGTH (MINIMUM OR AVERAGE):	MINIMUM	MINIMUM	MINIMUM	MINIMUM	
11	*DESIGN LIFE, hr.	100,000	100,000	100,000	100000	
12	* DESIGN PRESSURE, ELASTIC / RUPTURE, Psig.	150 -	150 -	150 -	150 -	
13	* DESIGN FLUID TEMPERATURE, °F.	650	650	650	650	
14	* TEMPERATURE ALLOWANCE, °F.	25	25	25	25	
15	* CORROSION ALLOWANCE, TUBES / FITTINGS, in.	0.0625 -	0.0625 -	0.0625 -	0.0625 -	
16	HYDROSTATIC TEST PRESSURE, Psig.	PER CODE	PER CODE	PER CODE	PER CODE	
17	* POST WELD HEAT TREATMENT (YES or NO)	NO	NO	NO	NO	
18	* PERCENT OF WELDS FULLY RADIOGRAPHED	10	10	10	10	
19	MAXIMUM (CLEAN) TUBE METAL TEMPERATURE, °F.	531	552	632	547	
20	DESIGN TUBE METAL TEMPERATURE, °F.	657	657	657	657	
21	INSIDE FILM COEFFICIENT, Btu/hr-ft^2-°F.	376	353	363	351	
22	**COIL ARRANGEMENT:**					
23	TUBE ORIENTATION: VERTICAL or HORIZONTAL	VERTICAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	
24	* TUBE MATERIAL (ASTM SPECIFICATION AND GRADE)	SA106 GR B	SA106 GR B	SA106 GR B	SA106 GR B	
25	TUBE OUTSIDE DIAMETER, in.	6.625	6.625	6.625	6.625	
26	TUBE WALL THICKNESS, (AVERAGE), in.	SCH 40	SCH 40	SCH 40	SCH 40	
27	NUMBER OF FLOW PASSES	5	5	5	5	
28	NUMBER OF TUBES / NUMBER OF TUBE ROWS	65 -	20 2	10 1	40 4	
29	NUMBER OF TUBES PER ROW (CONVECTION SECTION)	-	10	10	10	
30	OVERALL TUBE LENGTH, ft.	10 x 40.95', 55 x 41.45'	19.90	19.90	19.90	
31	EFFECTIVE TUBE LENGTH, ft.	43.00	18.67	18.67	18.67	
32	BARE TUBES: NUMBER	65	20	-	-	
33	TOTAL EXPOSED SURFACE, ft^2	4847	647	-	-	
34	EXTENDED SURFACE TUBES: NUMBER	-	-	10	40	
35	TOTAL EXPOSED SURFACE, ft^2	-	-	3675	16616	
36	TUBES LAYOUT (INLINE or STAGGERED)	INLINE	STAGGERED	STAGGERED	STAGGERED	
37	TUBE SPACING, CENT. TO CENT.: HORIZONTAL, in.	10 x 18", 55 x 12"	12	12	12	
38	DIAGONAL, in.	-	12	12	12	
39	VERTICAL, in.	-	10.4	10.4	10.4	
40	SPACING TUBE CENT. TO FURNACE WALL, in.	9	6	6	6	
41	CORBELS (YES or NO)	NO	AFTER 1ST ROW	YES	YES	
42	CORBEL WIDTH, in.	-	6	6	6	
43	**DESCRIPTION OF EXTENDED SURFACE:**					
44	TYPE: (STUDS) (SERRATED FINS) (SOLID FINS)			SERRATED	SERRATED	
45	MATERIAL			CS	CS	
46	DIMENSIONS: HEIGHT, in.			0.875	1	
47	THICKNESS, in.			0.06	0.06	
48	SPACING (No. / in.)			5	5	
49	MAXIMUM TIP TEMPERATURE, (CALCULATED), °F.			816	700	
50	EXTENSION RATIO (TOTAL AREA / BARE AREA)			11.35	12.83	
51	**PLUG TYPE HEADERS: NONE**					
52	* TYPE					
53	* MATERIAL (ASTM SPECIFICATION AND GRADE)					
54	NOMINAL RATING					
55	* LOCATION (ONE OR BOTH ENDS)					
56	WELDED OR ROLLED JOINT					
57	NOTES:					
58						
59						
60						

MECHANICAL DESIGN CONDITIONS (Cont'd)

1	HEATER SECTION	RADIANT	SHOCK	CONVECTION		REV
2	SERVICE	HOT OIL	HOT OIL	HOT OIL		
3	**RETURN BENDS:**					
4	TYPE	U-BEND	U-BEND	U-BEND		
5	MATERIAL (ASTM SPECIFICATION AND GRADE)	SA234 WPB	SA234 WPB	SA234 WPB		
6	NOMINAL RATING OR SCHEDULE	SCH 40	SCH 40	SCH 40		
7	LOCATION (F.B..=FIREBOX, H.B..=HEADER BOX)	FB	HB	HB		
8	**TERMINALS / MANIFOLDS:**					
9	TYPE (BEV..=BEVELED, MAN.=MANIFOLD, FLG..=FLANGED	FLG		MAN		
10	INLET: MATERIAL (ASTM SPECIFICATION AND GRADE)			SA106 GR B		
11	SIZE			16 NPS		
12	SCHEDULE OR THICKNESS			STD		
13	NUMBER OF TERMINALS			1		
14	FLANGE MATERIAL (ASTM SPEC. AND GRADE)			SA105		
15	FLANGE SIZE AND RATING			300#		
16	OUTLET: MATERIAL (ASTM SPECIFICATION AND GRADE)	SA106 GR B				
17	SIZE	6				
18	SCHEDULE OR THICKNESS	SCH 40				
19	NUMBER OF TERMINALS	5				
20	FLANGE MATERIAL (ASTM SPEC. AND GRADE)	SA105				
21	FLANGE SIZE AND RATING	300#				
22	MANIFOLD TO TUBE CONN. (WELDED, EXTRUDED, ETC.)	**OUTLET MANIFOLD**		WELDED		
23	MANIFOLD LOCATION (INSIDE OR OUTSIDE HEADER BOX)	**BY OTHERS**		EXTERNAL		
24	**CROSSOVERS:**					
25	WELDED OR FLANGED		WELDED			
26	PIPE MATERIAL (ASTM SPECIFICATION AND GRADE)		SA106 GR B			
27	PIPE SIZE		6			
28	PIPE SCHEDULE OR THICKNESS		SCH 40			
29	FLANGE MATERIAL		-			
30	FLANGE SIZE / RATING		-			
31	LOCATION (INTERNAL / EXTERNAL)		EXTERNAL			
32	FLUID TEMPERATURE, °F.		355			
33	**TUBE SUPPORTS:**					
34	LOCATION (ENDS, TOP, BOTTOM)	TOP	ENDS	ENDS		
35	MATERIAL (ASTM SPECIFICATION AND GRADE)	HK40	A36	A36		
36	DESIGN METAL TEMPERATURE, °F.					
37	THICKNESS, IN.		3/8	3/8		
38	INSULATION: THICKNESS, in.		4	4		
39	MATERIAL		REFRACTORY	REFRACTORY		
40	ANCHOR (MATERIAL AND TYPE)		304SS V-ANCHORS	304SS V-ANCHORS		
41	**INTERMEDIATE TUBE SUPPORTS:**					
42	MATERIAL (ASTM SPECIFICATION AND GRADE)					
43	DESIGN METAL TEMPERATURE, °F.					
44	THICKNESS, IN.					
45	SPACING, ft.					
46	**TUBE GUIDES:**					
47	LOCATION	BOTTOM				
48	MATERIAL	310SS				
49	TYPE / SPACING					
50	**HEADER BOXES:**					
51	LOCATION: CONVECTION ENDS		HINGED DOOR / BOLTED PANEL: BOLTED			
52	CASING MATERIAL: A36		THICKNESS, in. 3/16			
53	LINING MATERIAL: 8# CERAMIC FIBER BLANKET		THICKNESS, in. 1			
54	ANCHOR (MATERIAL AND TYPE): 304 SS PINS & CLIPS					
55	NOTES:					
56						
57						
58						
59						
60						

MECHANICAL DESIGN CONDITIONS (Cont'd)

REFRACTORY DESIGN BASIS:

						REV
AMBIENT, °F: 80		WIND VELOCITY, mph: 0		CASING TEMP., °F:	200	

EXPOSED VERTICAL WALLS:

LINING THICKNESS, in.:		HOT FACE TEMPERATURE, SERVICE, °F: 2300		CALCULATED, °F:	
WALL CONSTRUCTION:					
ANCHOR (MATERIAL & TYPE):					
CASING MATERIAL:		THICKNESS, in.:		TEMPERATURE, °F.	

SHIELDED VERTICAL WALLS:

LINING THICKNESS, in:	3	HOT FACE TEMPERATURE, SERVICE, °F: 2300		CALCULATED, °F:	1076
WALL CONSTRUCTION:	1 8# Ceramic Fiber Blanket				
	2 6# Ceramic Fiber Blanket				
ANCHOR (MATERIAL & TYPE):	304 SS Pins & Clips				
CASING MATERIAL:	A36	THICKNESS, in. :	1/4	TEMPERATURE, °F:	<200

ARCH:

LINING THICKNESS, in. :	4	HOT FACE TEMPERATURE, SERVICE, °F: 2300		CALCULATED, °F:	1657
WALL CONSTRUCTION:	2 8# Ceramic Fiber Blanket				
	2 6# Ceramic Fiber Blanket				
ANCHOR (MATERIAL & TYPE):	310 SS Pins & Clips				
CASING MATERIAL:	A36	THICKNESS, in. :	1/4	TEMPERATURE, °F:	<200

FLOOR:

LINING THICKNESS, in. :	6	HOT FACE TEMPERATURE, SERVICE, °F: 2300		CALCULATED, °F:	1457
FLOOR CONSTRUCTION:	6 Kaolite 2300 LI				
CASING MATERIAL:	A36				
ELEVATION ABOVE GRADE, ft:	10	THICKNESS, in. :	1/4	TEMPERATURE, °F:	200 (1)

CONVECTION SECTION:

LINING THICKNESS, in. :	3	HOT FACE TEMPERATURE, SERVICE, °F: 2300		CALCULATED, °F:	1114
WALL CONSTRUCTION:	1 8# Ceramic Fiber Blanket				
	2 6# Ceramic Fiber Blanket				
ANCHOR (MATERIAL & TYPE):	304 SS Pins & Clips (310 SS to Shock Rows)				
CASING MATERIAL:	A36	THICKNESS, in. :	3/16	TEMPERATURE, °F.	<200

INTERNAL WALL:

TYPE:		MATERIAL:	
DIMENSION, HEIGHT / WIDTH, ft.:			

DUCTS:	FLUE GAS			COMBUSTION AIR	
LOCATION	CONV BREECHING	TRANSITION			
SIZE, ft. OR NET FREE AREA, ft^2					
CASING MATERIAL	A36	A36			
CASING THICKNESS, in.	3/16	1/4			
LINING: INTERNAL / EXTERNAL	INTERNAL				
THICKNESS, in.	1				
MATERIAL	8# CFB				
ANCHOR (MATERIAL & TYPE)	CS Pins & Clips				
CASING TEMPERATURE, °F.	<200				

PLENUM CHAMBER (AIR):

TYPE OF PLENUM (COMMON OR INTEGRAL):			
CASING MATERIAL:	THICKNESS, in. :	SIZE, ft. :	
LINING MATERIAL:		THICKNESS, in. :	
ANCHOR (MATERIAL & TYPE):			

NOTES:

1. Measured at the burner face.

MECHANICAL DESIGN CONDITIONS (Continued)

STACK OR STACK STUB:

							REV
NUMBER:	1	SELF-SUPPORTED OR GUYED:	SELF-SUPPORTED	LOCATION: TOP OF CONVECTION			
CASING MATERIAL:	A36	CORROSION ALLOWANCE, in. :	1/8	MIN THICKNESS, in. :	3/16		
OUTSIDE METAL DIAMETER, ft. :	7' - 6"	ESTIMATED HEIGHT ABOVE GRADE, ft. :	148	STACK LENGTH, ft. :	80' - 0"		
LINING MATERIAL:	-			THICKNESS, in. :	0		
ANCHOR (MATERIAL AND TYPE):	-						
EXTENT OF LINING:	-	INTERNAL OR EXTERNAL:	-				
DESIGN FLUE GAS VELOCITY, ft/sec. :	22	FLUE GAS TEMPERATURE, °F. :	571				

DAMPERS:

LOCATION:	STACK				
TYPE (CONTROL, TIGHT SHUT-OFF, ETC.)	CONTROL				
MATERIAL: BLADE	CS				
SHAFT	CS				
MULTIPLE / SINGLE LEAF	MULTIPLE				
PROVISION FOR OPERATION (MANUAL OR AUTOMATIC)	MANUAL				
TYPE OF OPERATOR (CABLE OR PNEUMATIC)	CABLE				

PLATFORMS:

LOCATION	NUMBER	WIDTH	LENGTH	STAIRS / LADDER	ACCESS FROM
HEARTH LEVEL PLATFORM	# BURNERS	3 ft	4 ft	LADDER	GRADE
CONVECTION PLATFORMS	1 SIDE	3 ft	8 ft	LADDER	PLATFORM
STACK DAMPER PLATFORM	1	3 ft	270°	LADDER	PLATFORM
EPA CONNECTION PLATFORM	1	3 ft	180°	LADDER	PLATFORM

TYPE OF FLOORING: GRATING

DOORS:

TYPE	NUMBER	LOCATION	SIZE	BOLTED/HINGED
ACCESS	1	Radiant Floor	24" x 24"	Botled
	1	Conv Roof	24" x 24"	Bolted
OBSERVATION	1 per burner	Radiant Sidewall	5" x 9"	Hinged
	1 per burner	Radiant Floor	4" DIA	
TUBE REMOVAL	1	Radiant Roof	24" x 24"	Bolted

MISCELLANEOUS:

INSTRUMENT CONNECTIONS		NUMBER	SIZE	TYPE
COMBUSTION AIR:	TEMPERATURE			
	PRESSURE			
FLUE GAS:	TEMPERATURE	4	1-1/2"	3000# CPLG
	PRESSURE	5	1-1/2"	3000# CPLG
FLUE GAS SAMPLE		2	4"	150# RFWN
SNUFFING STEAM / PURGE		2	2"	3000# CPLG
O2 ANALYZER		1	4"	150# RFWN
EPA CONNECTIONS		2	4"	150# RFWN
VENTS / DRAINS				
PROCESS FLUID TEMPERATURE				
TUBESKIN THERMOCOUPLES				

PAINTING REQUIREMENTS: Commercial Sandblast (SP-6) and Inorganic Zinc Primer on Heater and Stack

INTERNAL COATING: None

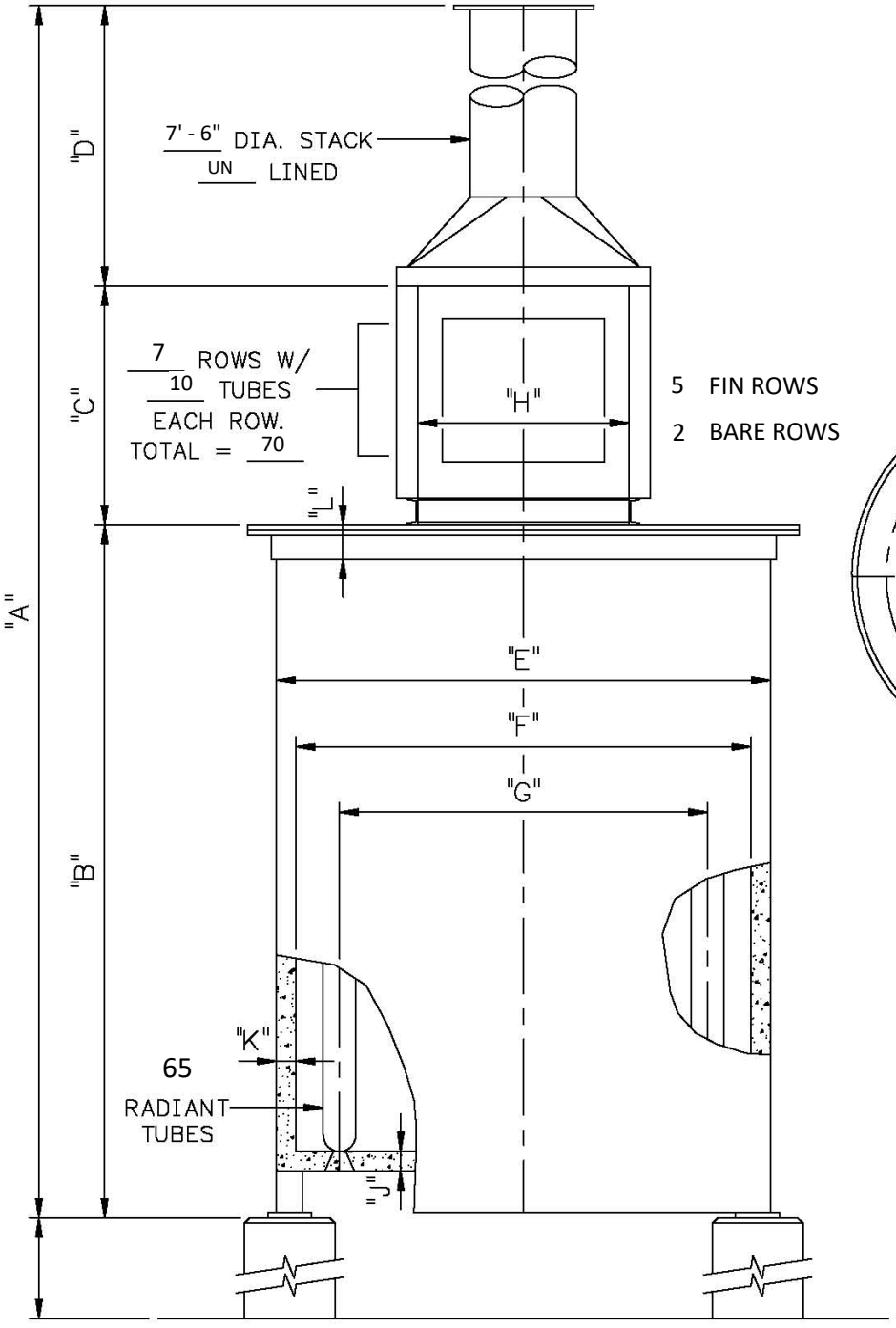
GALVANIZING REQUIREMENTS: L&Ps / Handrails are hot-dip galvanized.

ARE PAINTERS TROLLEY AND RAIL INCLUDED (YES OR NO): NO

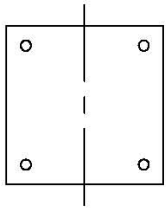
SPECIAL EQUIPMENT: SOOTBLOWERS: NO
AIR PREHEATER: NO
FAN(S): NO
OTHER: Downdraft Eliminator (Adder)

NOTES:

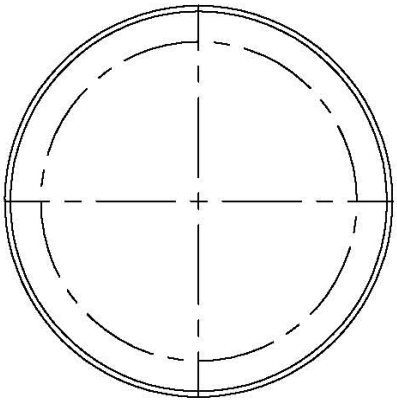
Doors and miscellaneous entries are for example only and may be altered by the customer to fit their needs. Platforms are available as an adder.



SCHEMATIC FLOW



CONVECTION



RADIANT

BOTTOM RADIANT OUTLET

10 x 18", 55 x 12"

5 PASS COIL

DIMENSION SCHEDULE

"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"J"	"K"	"L"			
136' - 1"	46' - 0"	10' - 2"	80' - 0"	24' - 3"	23' - 9"	22' - 3"	11' - 0"	6"	3"	4"			

OPTIMIZED PROCESS FURNACES, INC.
P.O. BOX 706
CHANUTE, KANSAS 66720

TITLE HOT OIL HEATER
HT-49200/59200

2024-025-1 REV. 2

STABHR-1

OPTIONAL ITEMS: (NOT REQUIRED FOR HEATER OPERATION)

Model	Description	Investment (U.S. $)
5 Days Service On-site	Estimate (1 Man, 1 Trip, 2 Weeks Notice)	See Page 25
Industrial Customer School	Tentatively in April / October	$1,875.00
Low NOx Burner	< 30 ppm NOx, < 50 ppm CO emissions	$23,214.00
Class I, Div 2 Classification	Equipment suitable for Class I, Div 2 Area	$9,250.00
Pump Skid	Pump Skid with 2 Pumps (Dean RA3146), Slip Stream Filter, Expansion Tank and Tower	$132,111.00
Spare Parts	Commissioning and 2 Years Spare Parts	TBD

LOW NOX BURNER OPTION:
POWER FLAME TYPE EVO BURNER:
The Power Flame EVO™ burner offers staged/premix combustion technology to maximize operating efficiency and reduce NOx emission on natural gas firing below 30 PPM without the use of flue gas recirculation (FGR). Designed to fire a range of gaseous fuels and light oil, this burner utilizes a unique firing head design which provides stable combustion over a wide turndown.

- Direct spark ignited natural gas pilot (Interrupted type)
- Ignition transformer
- UV self-checking flame detection scanner
- Blower is integral to burner
- Inlet damper with modulation motor, duct and combustion air pressure switch

Emission Guarantees based on HHV:
NOx < 30 ppm = 0.0365 lb/mmbtu
CO < 50 ppm = 0.0377 lb/mmbtu.

- All emissions are at 100% of maximum combustion rating (MCR) and are in the units of PPM referenced to 3% dry stack oxygen
- Emissions are valid for natural gas combustion only. The values are based on natural gas containing no fuel bound nitrogen and no sulfur

Flare Specifications

REDEFINING [COMBUSTION]

ZEECO, INC.
22151 East 91st Street
Broken Arrow, OK 74014 USA

+1 (918) 258 8551 | sales@zeeco.com | zeeco.com

REFERENCE:	71308 | Emissions	**DATE:**	December 6, 2024
DELIVER TO:	Northwind Midstream		

To Whom it May Concern,

The hydrocarbon destruction efficiency for the combustion system provided on quote number 2024-06546RA-01 R0 and shop order number 71308 will be 98% or higher as long as the flare is operated and maintained within the designed operating parameters and accepted industry standard practices for this type of equipment.

Thank you and Best Regards,

Brady Parmenter
Rentals Global Business Development Manager
Zeeco Inc.

P: 918-261-6297
Email: brady_parmenter@zeeco.com

REDEFINING [COMBUSTION]

ZEECO, INC.
22151 East 91st Street
Broken Arrow, OK 74014 USA

+1 (918) 258 8551 | sales@zeeco.com | zeeco.com

REFERENCE:	71334 | Emissions	**DATE:**	December 6, 2024
DELIVER TO:	Northwind Midstream		

To Whom it May Concern,

The hydrocarbon destruction efficiency for the combustion system provided on quote number 2024-03784FL-01 and shop order number 71334 will be 98% or higher as long as the flare is operated and maintained within the designed operating parameters and accepted industry standard practices for this type of equipment.

Thank you and Best Regards,

Chris O'Kelly

Chris O'Kelly
Flares Applications Engineer
Zeeco Inc.

P: 918-893-8302
Email: chris_okelly@zeeco.com

AP-42 Emission Factors

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

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

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

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

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

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

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

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

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

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

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

Table 3.1-2a. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM STATIONARY GAS TURBINES

Emission Factors[a] - Uncontrolled				
Pollutant	Natural Gas-Fired Turbines[b]		Distillate Oil-Fired Turbines[d]	
	(lb/MMBtu)[c] (Fuel Input)	Emission Factor Rating	(lb/MMBtu)[e] (Fuel Input)	Emission Factor Rating
CO_2[f]	110	A	157	A
N_2O	0.003[g]	E	ND	NA
Lead	ND	NA	1.4 E-05	C
SO_2	0.94S[h]	B	1.01S[h]	B
Methane	8.6 E-03	C	ND	NA
VOC	2.1 E-03	D	4.1 E-04[j]	E
TOC[k]	1.1 E-02	B	4.0 E-03[l]	C
PM (condensible)	4.7 E-03[l]	C	7.2 E-03[l]	C
PM (filterable)	1.9 E-03[l]	C	4.3 E-03[l]	C
PM (total)	6.6 E-03[l]	C	1.2 E-02[l]	C

[a] Factors are derived from units operating at high loads (≥ 80 percent load) only. For information on units operating at other loads, consult the background report for this chapter (Reference 16), available at "www.epa.gov/ttn/chief". ND = No Data, NA = Not Applicable.

[b] SCCs for natural gas-fired turbines include 2-01-002-01, 2-02-002-01 & 03, and 2-03-002-02 & 03.

[c] Emission factors based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60°F. To convert from (lb/MMBtu) to ($lb/10^6$ scf), multiply by 1020. Similarly, these emission factors can be converted to other natural gas heating values.

[d] SCCs for distillate oil-fired turbines are 2-01-001-01, 2-02-001-01, 2-02-001-03, and 2-03-001-02.

[e] Emission factors based on an average distillate oil heating value of 139 $MMBtu/10^3$ gallons. To convert from (lb/MMBtu) to ($lb/10^3$ gallons), multiply by 139.

[f] Based on 99.5% conversion of fuel carbon to CO_2 for natural gas and 99% conversion of fuel carbon to CO_2 for distillate oil. CO_2 (Natural Gas) [lb/MMBtu] = (0.0036 scf/Btu)(%CON)(C)(D), where %CON = weight percent conversion of fuel carbon to CO_2, C = carbon content of fuel by weight, and D = density of fuel. For natural gas, C is assumed at 75%, and D is assumed at 4.1 E+04 $lb/10^6$scf. For distillate oil, CO_2 (Distillate Oil) [lb/MMBtu] = (26.4 gal/MMBtu) (%CON)(C)(D), where C is assumed at 87%, and the D is assumed at 6.9 lb/gallon.

[g] Emission factor is carried over from the previous revision to AP-42 (Supplement B, October 1996) and is based on limited source tests on a single turbine with water-steam injection (Reference 5).

[h] All sulfur in the fuel is assumed to be converted to SO_2. S = percent sulfur in fuel. Example, if sulfur content in the fuel is 3.4 percent, then S = 3.4. If S is not available, use 3.4 E-03 lb/MMBtu for natural gas turbines, and 3.3 E-02 lb/MMBtu for distillate oil turbines (the equations are more accurate).

[j] VOC emissions are assumed equal to the sum of organic emissions.

[k] Pollutant referenced as THC in the gathered emission tests. It is assumed as TOC, because it is based on EPA Test Method 25A.

[l] Emission factors are based on combustion turbines using water-steam injection.

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

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

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

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

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

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

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-Methylchloranthrene[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
205-82-3	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

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
74-98-6	Propane	1.6E+00	E
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 1.4-4. EMISSION FACTORS FOR METALS FROM NATURAL GAS COMBUSTION[a]

CAS No.	Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
7440-38-2	Arsenic[b]	2.0E-04	E
7440-39-3	Barium	4.4E-03	D
7440-41-7	Beryllium[b]	<1.2E-05	E
7440-43-9	Cadmium[b]	1.1E-03	D
7440-47-3	Chromium[b]	1.4E-03	D
7440-48-4	Cobalt[b]	8.4E-05	D
7440-50-8	Copper	8.5E-04	C
7439-96-5	Manganese[b]	3.8E-04	D
7439-97-6	Mercury[b]	2.6E-04	D
7439-98-7	Molybdenum	1.1E-03	D
7440-02-0	Nickel[b]	2.1E-03	C
7782-49-2	Selenium[b]	<2.4E-05	E
7440-62-2	Vanadium	2.3E-03	D
7440-66-6	Zinc	2.9E-02	E

[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. Emission factors preceeded by a less-than symbol are based on method detection limits. To convert from $lb/10^6$ scf to $kg/10^6$ m^3, multiply by l6. To convert from $lb/10^6$ scf to 1b/MMBtu, divide by 1,020.

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

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)

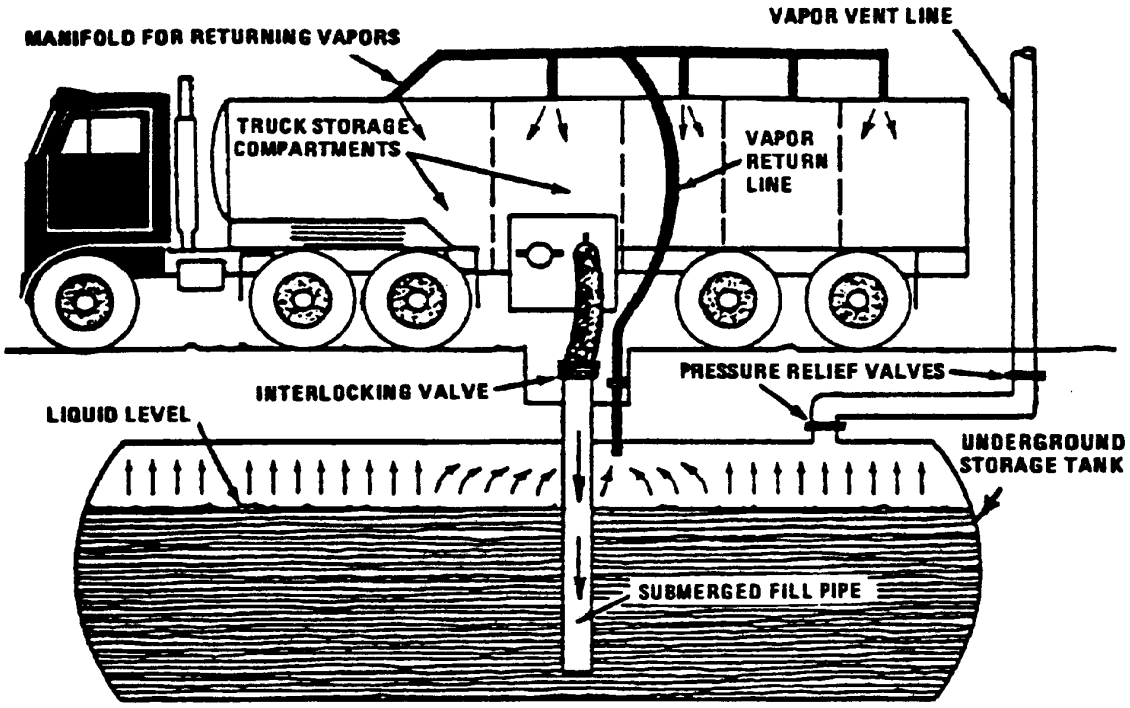


Figure 5.2-5. Tank truck unloading into a service station underground storage tank and practicing "vapor balance" form of emission control.

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

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

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

The saturation factor, S, represents the expelled vapor's fractional approach to saturation, and it accounts for the variations observed in emission rates from the different unloading and loading methods. Table 5.2-1 lists suggested saturation factors.

Emissions from controlled loading operations can be calculated by multiplying the uncontrolled emission rate calculated in Equation 1 by an overall reduction efficiency term:

$$\left(1 - \frac{\text{eff}}{100}\right)$$

The overall reduction efficiency should account for the capture efficiency of the collection system as well as both the control efficiency and any downtime of the control device. Measures to reduce loading emissions include selection of alternate loading methods and application of vapor recovery equipment. The latter captures organic vapors displaced during loading operations and recovers the vapors by the use of refrigeration, absorption, adsorption, and/or compression. The recovered product is piped back to storage. Vapors can also be controlled through combustion in a thermal oxidation unit, with no product recovery. Figure 5.2-6 demonstrates the recovery of gasoline vapors from tank trucks during loading operations at bulk terminals. Control efficiencies for the recovery units range from 90 to over 99 percent, depending on both the nature of the vapors and the type of control equipment used.[5-6] However, not all of the displaced vapors reach the control device, because of leakage from both the tank truck and collection system. The collection efficiency should be assumed to be 99.2 percent for tanker trucks passing the MACT-level annual leak test (not more than 1 inch water column pressure change in 5 minutes after pressurizing to 18 inches water followed by pulling a vacuum of 6 inches water).[7] A collection efficiency of 98.7 percent (a 1.3 percent leakage rate) should be assumed for trucks passing the NSPS-level annual test (3 inches pressure change) A collection efficiency of 70 percent should be assumed for trucks not passing one of these annual leak tests[6].

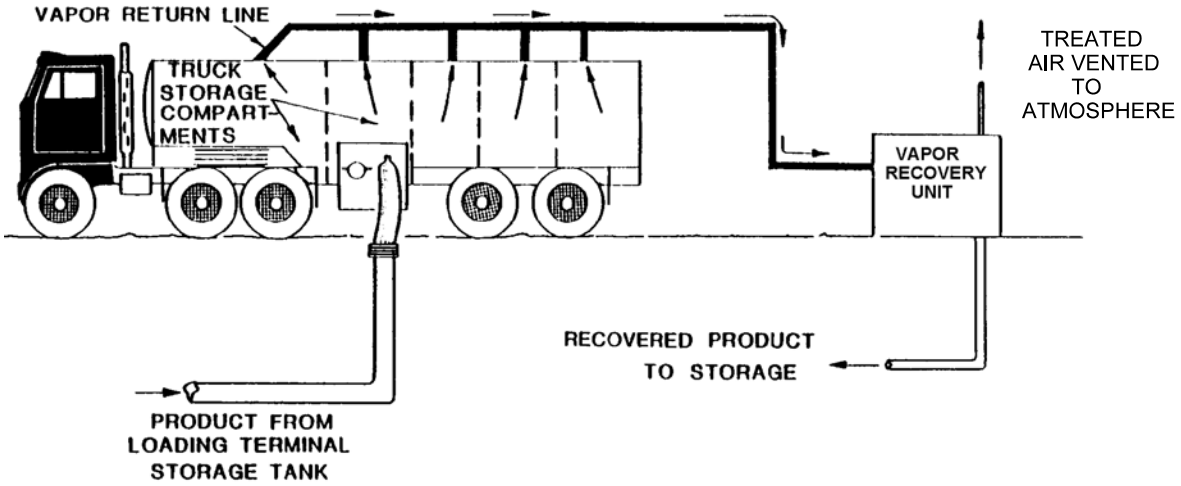


Figure 5.2-6. Tank truck loading with vapor recovery.

Sample Calculation -

Loading losses (L_L) from a gasoline tank truck in dedicated vapor balance service and practicing vapor recovery would be calculated as follows, using Equation 1:

Design basis -

Cargo tank volume is 8000 gal
Gasoline Reid vapor pressure (RVP) is 9 psia
Product temperature is 80°F
Vapor recovery efficiency is 95 percent
Vapor collection efficiency is 98.7 percent (NSPS-level annual leak test)

Loading loss equation -

$$L_L = 12.46 \frac{SPM}{T}\left(1 - \frac{eff}{100}\right)$$

where:

S = saturation factor (see Table 5.2-1) - 1.00
P = true vapor pressure of gasoline = 6.6 psia
M = molecular weight of gasoline vapors = 66
T = temperature of gasoline = 540°R
eff = overall reduction efficiency (95 percent control x 98.7 percent collection) = 94 percent

$$L_L = 12.46 \frac{(1.00)(6.6)(66)}{540}\left(1 - \frac{94}{100}\right)$$

$$= 0.60 \text{ lb}/10^3 \text{ gal}$$

Total loading losses are:

$$(0.60 \text{ lb}/10^3 \text{ gal})(8.0 \times 10^3 \text{ gal}) = 4.8 \text{ pounds (lb)}$$

Measurements of gasoline loading losses from ships and barges have led to the development of emission factors for these specific loading operations.[8] These factors are presented in Table 5.2-2 and should be used instead of Equation 1 for gasoline loading operations at marine terminals. Factors are expressed in units of milligrams per liter (mg/L) and pounds per 1000 gallons (lb/10^3 gal).

13.2.2 Unpaved Roads

13.2.2.1 General

When a vehicle travels an unpaved road, the force of the wheels on the road surface causes pulverization of surface material. Particles are lifted and dropped from the rolling wheels, and the road surface is exposed to strong air currents in turbulent shear with the surface. The turbulent wake behind the vehicle continues to act on the road surface after the vehicle has passed.

The particulate emission factors presented in the previous draft version of this section of AP-42, dated October 2001, implicitly included the emissions from vehicles in the form of exhaust, brake wear, and tire wear as well as resuspended road surface material[25]. EPA included these sources in the emission factor equation for unpaved public roads (equation 1b in this section) since the field testing data used to develop the equation included both the direct emissions from vehicles and emissions from resuspension of road dust.

This version of the unpaved public road emission factor equation only estimates particulate emissions from resuspended road surface material [23, 26]. The particulate emissions from vehicle exhaust, brake wear, and tire wear are now estimated separately using EPA's MOBILE6.2 [24]. This approach eliminates the possibility of double counting emissions. Double counting results when employing the previous version of the emission factor equation in this section and MOBILE6.2 to estimate particulate emissions from vehicle traffic on unpaved public roads. It also incorporates the decrease in exhaust emissions that has occurred since the unpaved public road emission factor equation was developed. The previous version of the unpaved public road emission factor equation includes estimates of emissions from exhaust, brake wear, and tire wear based on emission rates for vehicles in the 1980 calendar year fleet. The amount of PM released from vehicle exhaust has decreased since 1980 due to lower new vehicle emission standards and changes in fuel characteristics.

13.2.2.2 Emissions Calculation And Correction Parameters[1-6]

The quantity of dust emissions from a given segment of unpaved road varies linearly with the volume of traffic. Field investigations also have shown that emissions depend on source parameters that characterize the condition of a particular road and the associated vehicle traffic. Characterization of these source parameters allow for "correction" of emission estimates to specific road and traffic conditions present on public and industrial roadways.

Dust emissions from unpaved roads have been found to vary directly with the fraction of silt (particles smaller than 75 micrometers [μm] in diameter) in the road surface materials.[1] The silt fraction is determined by measuring the proportion of loose dry surface dust that passes a 200-mesh screen, using the ASTM-C-136 method. A summary of this method is contained in Appendix C of AP-42. Table 13.2.2-1 summarizes measured silt values for industrial unpaved roads. Table 13.2.2-2 summarizes measured silt values for public unpaved roads. It should be noted that the ranges of silt content vary over two orders of magnitude. Therefore, the use of data from this table can potentially introduce considerable error. Use of this data is strongly discouraged when it is feasible to obtain locally gathered data.

Since the silt content of a rural dirt road will vary with geographic location, it should be measured for use in projecting emissions. As a conservative approximation, the silt content of the parent soil in the area can be used. Tests, however, show that road silt content is normally lower than in the surrounding parent soil, because the fines are continually removed by the vehicle traffic, leaving a higher percentage of coarse particles.

Other variables are important in addition to the silt content of the road surface material. For example, at industrial sites, where haul trucks and other heavy equipment are common, emissions are highly correlated with vehicle weight. On the other hand, there is far less variability in the weights of cars and pickup trucks that commonly travel publicly accessible unpaved roads throughout the United States. For those roads, the moisture content of the road surface material may be more dominant in determining differences in emission levels between, for example a hot, desert environment and a cool, moist location.

The PM-10 and TSP emission factors presented below are the outcomes from stepwise linear regressions of field emission test results of vehicles traveling over unpaved surfaces. Due to a limited amount of information available for PM-2.5, the expression for that particle size range has been scaled against the result for PM-10. Consequently, the quality rating for the PM-2.5 factor is lower than that for the PM-10 expression.

Table 13.2.2-1. TYPICAL SILT CONTENT VALUES OF SURFACE MATERIAL ON INDUSTRIAL UNPAVED ROADS[a]

Industry	Road Use Or Surface Material	Plant Sites	No. Of Samples	Silt Content (%)	
				Range	Mean
Copper smelting	Plant road	1	3	16 - 19	17
Iron and steel production	Plant road	19	135	0.2 - 19	6.0
Sand and gravel processing	Plant road	1	3	4.1 - 6.0	4.8
	Material storage area	1	1	-	7.1
Stone quarrying and processing	Plant road	2	10	2.4 - 16	10
	Haul road to/from pit	4	20	5.0-15	8.3
Taconite mining and processing	Service road	1	8	2.4 - 7.1	4.3
	Haul road to/from pit	1	12	3.9 - 9.7	5.8
Western surface coal mining	Haul road to/from pit	3	21	2.8 - 18	8.4
	Plant road	2	2	4.9 - 5.3	5.1
	Scraper route	3	10	7.2 - 25	17
	Haul road (freshly graded)	2	5	18 - 29	24
Construction sites	Scraper routes	7	20	0.56-23	8.5
Lumber sawmills	Log yards	2	2	4.8-12	8.4
Municipal solid waste landfills	Disposal routes	4	20	2.2 - 21	6.4

[a]References 1,5-15.

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

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

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

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

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

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

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

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

1 lb/VMT = 281.9 g/VKT

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

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

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

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

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

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

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

[a] See discussion in text.

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

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

as shown in Table 13.2.2-4

Table 13.2.2-4. EMISSION FACTOR FOR 1980'S VEHICLE FLEET EXHAUST, BRAKE WEAR AND TIRE WEAR

Particle Size Range[a]	*C*, Emission Factor for Exhaust, Brake Wear and Tire Wear[b] lb/VMT
$PM_{2.5}$	0.00036
PM_{10}	0.00047
PM_{30}[c]	0.00047

[a] Refers to airborne particulate matter (PM-x) with an aerodynamic diameter equal to or less than x micrometers.
[b] Units shown are pounds per vehicle mile traveled (lb/VMT).
[c] PM-30 is sometimes termed "suspendable particulate" (SP) and is often used as a surrogate for TSP.

It is important to note that the vehicle-related source conditions refer to the average weight, speed, and number of wheels for all vehicles traveling the road. For example, if 98 percent of traffic on the road are 2-ton cars and trucks while the remaining 2 percent consists of 20-ton trucks, then the mean weight is 2.4 tons. More specifically, Equations 1a and 1b are *not* intended to be used to calculate a separate emission factor for each vehicle class within a mix of traffic on a given unpaved road. That is, in the example, one should *not* determine one factor for the 2-ton vehicles and a second factor for the 20-ton trucks. Instead, only one emission factor should be calculated that represents the "fleet" average of 2.4 tons for all vehicles traveling the road.

Moreover, to retain the quality ratings when addressing a group of unpaved roads, it is necessary that reliable correction parameter values be determined for the road in question. The field and laboratory procedures for determining road surface silt and moisture contents are given in AP-42 Appendices C.1 and C.2. Vehicle-related parameters should be developed by recording visual observations of traffic. In some cases, vehicle parameters for industrial unpaved roads can be determined by reviewing maintenance records or other information sources at the facility.

In the event that site-specific values for correction parameters cannot be obtained, then default values may be used.In the absence of site-specific silt content information, an appropriate mean value from Table 13.2.2-1 may be used as a default value, but the quality rating of the equation is reduced by two letters. Because of significant differences found between different types of road surfaces and between different areas of the country, use of the default moisture content value of 0.5 percent in Equation 1b is discouraged. The quality rating should be downgraded two letters when the default moisture content value is used. (It is assumed that readers addressing industrial roads have access to the information needed to develop average vehicle information in Equation 1a for their facility.)

The effect of routine watering to control emissions from unpaved roads is discussed below in Section 13.2.2.3, “Controls”. However, all roads are subject to some natural mitigation because of rainfall and other precipitation. The Equation 1a and 1b emission factors can be extrapolated to annual

average uncontrolled conditions (but including natural mitigation) under the simplifying assumption that annual average emissions are inversely proportional to the number of days with measurable (more than 0.254 mm [0.01 inch]) precipitation:

$$E_{ext} = E\ [(365 - P)/365] \quad (2)$$

where:

E_{ext} = annual size-specific emission factor extrapolated for natural mitigation, lb/VMT

E = emission factor from Equation 1a or 1b

P = number of days in a year with at least 0.254 mm (0.01 in) of precipitation (see below)

Figure 13.2.2-1 gives the geographical distribution for the mean annual number of "wet" days for the United States.

Equation 2 provides an estimate that accounts for precipitation on an annual average basis for the purpose of inventorying emissions. It should be noted that Equation 2 does not account for differences in the temporal distributions of the rain events, the quantity of rain during any event, or the potential for the rain to evaporate from the road surface. In the event that a finer temporal and spatial resolution is desired for inventories of public unpaved roads, estimates can be based on a more complex set of assumptions. These assumptions include:

1. The moisture content of the road surface material is increased in proportion to the quantity of water added;
2. The moisture content of the road surface material is reduced in proportion to the Class A pan evaporation rate;
3. The moisture content of the road surface material is reduced in proportion to the traffic volume; and
4. The moisture content of the road surface material varies between the extremes observed in the area. The CHIEF Web site (http://www.epa.gov/ttn/chief/ap42/ch13/related/c13s02-2.html) has a file which contains a spreadsheet program for calculating emission factors which are temporally and spatially resolved. Information required for use of the spreadsheet program includes monthly Class A pan evaporation values, hourly meteorological data for precipitation, humidity and snow cover, vehicle traffic information, and road surface material information.

It is emphasized that the simple assumption underlying Equation 2 and the more complex set of assumptions underlying the use of the procedure which produces a finer temporal and spatial resolution have not been verified in any rigorous manner. For this reason, the quality ratings for either approach should be downgraded one letter from the rating that would be applied to Equation 1.

13.2.2.3 Controls[18-22]

A wide variety of options exist to control emissions from unpaved roads. Options fall into the following three groupings:

1. Vehicle restrictions that limit the speed, weight or number of vehicles on the road;

2. Surface improvement, by measures such as (a) paving or (b) adding gravel or slag to a dirt road; and

3. Surface treatment, such as watering or treatment with chemical dust suppressants.

Available control options span broad ranges in terms of cost, efficiency, and applicability. For example, traffic controls provide moderate emission reductions (often at little cost) but are difficult to enforce. Although paving is highly effective, its high initial cost is often prohibitive. Furthermore, paving is not feasible for industrial roads subject to very heavy vehicles and/or spillage of material in transport. Watering and chemical suppressants, on the other hand, are potentially applicable to most industrial roads at moderate to low costs. However, these require frequent reapplication to maintain an acceptable level of control. Chemical suppressants are generally more cost-effective than water but not in cases of temporary roads (which are common at mines, landfills, and construction sites). In summary, then, one needs to consider not only the type and volume of traffic on the road but also how long the road will be in service when developing control plans.

Vehicle restrictions. These measures seek to limit the amount and type of traffic present on the road or to lower the mean vehicle speed. For example, many industrial plants have restricted employees from driving on plant property and have instead instituted bussing programs. This eliminates emissions due to employees traveling to/from their worksites. Although the heavier average vehicle weight of the busses increases the base emission factor, the decrease in vehicle-miles-traveled results in a lower overall emission rate.

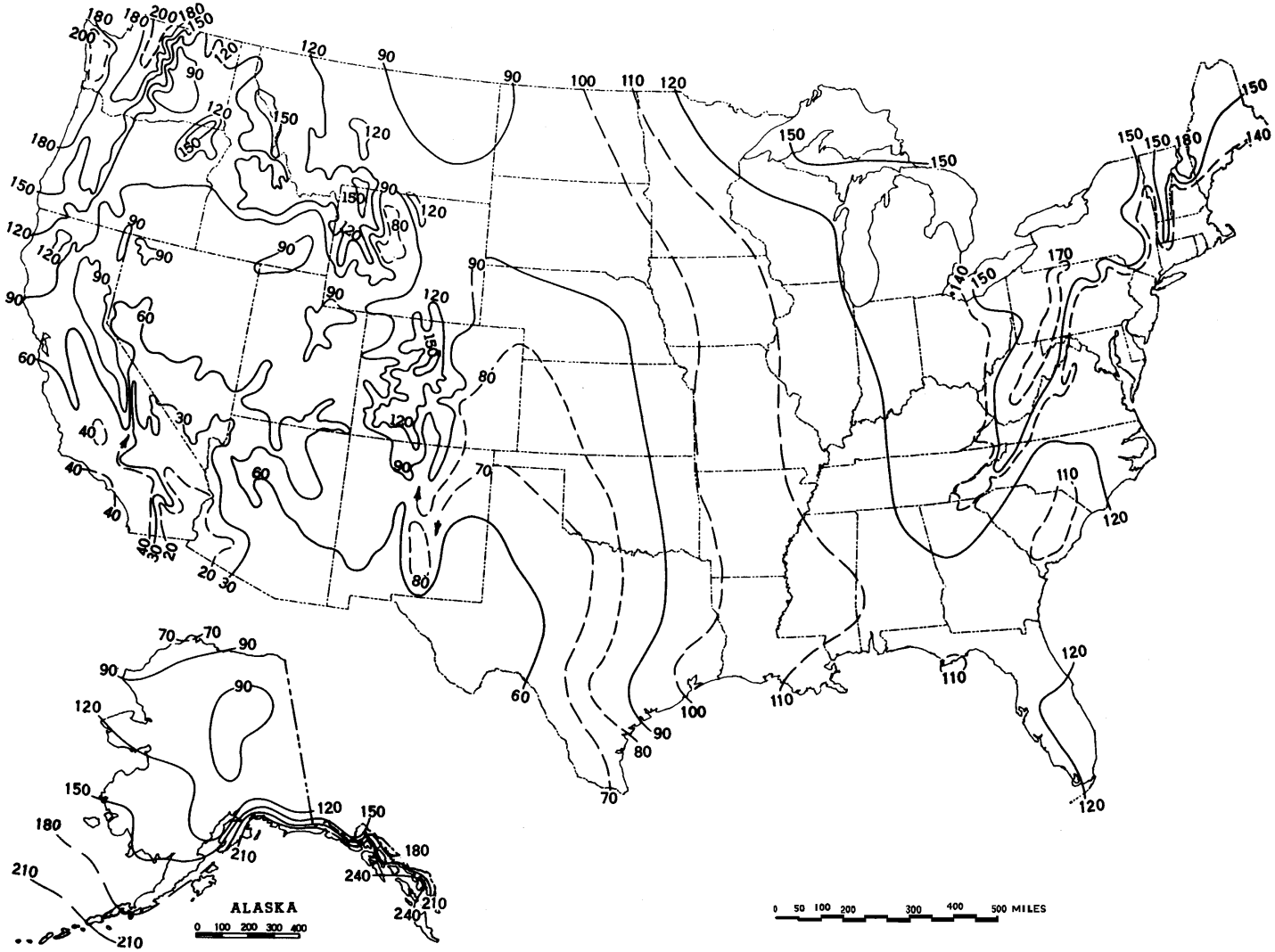


Figure 13.2.2-1. Mean number of days with 0.01 inch or more of precipitation in United States.

Surface improvements. Control options in this category alter the road surface. As opposed to the "surface treatments" discussed below, improvements are relatively "permanent" and do not require periodic retreatment.

The most obvious surface improvement is paving an unpaved road. This option is quite expensive and is probably most applicable to relatively short stretches of unpaved road with at least several hundred vehicle passes per day. Furthermore, if the newly paved road is located near unpaved areas or is used to transport material, it is essential that the control plan address routine cleaning of the newly paved road surface.

The control efficiencies achievable by paving can be estimated by comparing emission factors for unpaved and paved road conditions. The predictive emission factor equation for paved roads, given in Section 13.2.1, requires estimation of the silt loading on the traveled portion of the paved surface, which in turn depends on whether the pavement is periodically cleaned. Unless curbing is to be installed, the effects of vehicle excursion onto unpaved shoulders (berms) also must be taken into account in estimating the control efficiency of paving.

Other improvement methods cover the road surface with another material that has a lower silt content. Examples include placing gravel or slag on a dirt road. Control efficiency can be estimated by comparing the emission factors obtained using the silt contents before and after improvement. The silt content of the road surface should be determined after 3 to 6 months rather than immediately following placement. Control plans should address regular maintenance practices, such as grading, to retain larger aggregate on the traveled portion of the road.

Surface treatments refer to control options which require periodic reapplication. Treatments fall into the two main categories of (a) "wet suppression" (i. e., watering, possibly with surfactants or other additives), which keeps the road surface wet to control emissions and (b) "chemical stabilization/ treatment", which attempts to change the physical characteristics of the surface. The necessary reapplication frequency varies from several minutes for plain water under summertime conditions to several weeks or months for chemical dust suppressants.

Watering increases the moisture content, which conglomerates particles and reduces their likelihood to become suspended when vehicles pass over the surface. The control efficiency depends on how fast the road dries after water is added. This in turn depends on (a) the amount (per unit road surface area) of water added during each application; (b) the period of time between applications; (c) the weight, speed and number of vehicles traveling over the watered road during the period between applications; and (d) meteorological conditions (temperature, wind speed, cloud cover, etc.) that affect evaporation during the period.

Figure 13.2.2-2 presents a simple bilinear relationship between the instantaneous control efficiency due to watering and the resulting increase in surface moisture. The moisture ratio "M" (i.e., the x-axis in Figure 13.2.2-2) is found by dividing the surface moisture content of the watered road by the surface moisture content of the uncontrolled road. As the watered road surface dries, both the ratio M and the predicted instantaneous control efficiency (i.e., the y-axis in the figure) decrease. The figure shows that between the uncontrolled moisture content and a value twice as large, a small increase in moisture content results in a large increase in control efficiency. Beyond that, control efficiency grows slowly with increased moisture content.

Given the complicated nature of how the road dries, characterization of emissions from watered roadways is best done by collecting road surface material samples at various times between water truck passes. (Appendices C.1 and C.2 present the sampling and analysis procedures.) The moisture content measured can then be associated with a control efficiency by use of Figure 13.2.2-2. Samples that reflect average conditions during the watering cycle can take the form of either a series of samples between water applications or a single sample at the midpoint. It is essential that samples be collected during periods with active traffic on the road. Finally, because of different evaporation rates, it is recommended that samples be collected at various times during the year. If only one set of samples is to be collected, these must be collected during hot, summertime conditions.

When developing watering control plans for roads that do not yet exist, it is strongly recommended that the moisture cycle be established by sampling similar roads in the same geographic area. If the moisture cycle cannot be established by similar roads using established watering control plans, the more complex methodology used to estimate the mitigation of rainfall and other precipitation can be used to estimate the control provided by routine watering. An estimate of the maximum daytime Class A pan evaporation (based upon daily evaporation data published in the monthly Climatological Data for the state by the National Climatic Data Center) should be used to insure that adequate watering capability is available during periods of highest evaporation. The hourly precipitation values in the spreadsheet should be replaced with the equivalent inches of precipitation (where the equivalent of 1 inch of precipitation is provided by an application of 5.6 gallons of water per square yard of road). Information on the long term average annual evaporation and on the percentage that occurs between May and October was published in the Climatic Atlas (Reference 16). Figure 13.2.2-3 presents the geographical distribution for "Class A pan evaporation" throughout the United States. Figure 13.2.2-4 presents the geographical distribution of the percentage of this evaporation that occurs between May and October. The U. S. Weather Bureau Class A evaporation pan is a cylindrical metal container with a depth of 10 inches and a diameter of 48 inches. Periodic measurements are made of the changes of the water level.

The above methodology should be used only for prospective analyses and for designing watering programs for existing roadways. The quality rating of an emission factor for a watered road that is based on this methodology should be downgraded two letters. Periodic road surface samples should be collected and analyzed to verify the efficiency of the watering program.

As opposed to watering, chemical dust suppressants have much less frequent reapplication requirements. These materials suppress emissions by changing the physical characteristics of the existing road surface material. Many chemical unpaved road dust suppressants form a hardened surface that binds particles together. After several applications, a treated road often resembles a paved road except that the surface is not uniformly flat. Because the improved surface results in more grinding of small particles, the silt content of loose material on a highly controlled surface may be substantially higher than when the surface was uncontrolled. For this reason, the models presented as Equations 1a and 1b cannot be used to estimate emissions from chemically stabilized roads. Should the road be allowed to return to an

uncontrolled state with no visible signs of large-scale cementing of material, the Equation 1a and 1b emission factors could then be used to obtain conservatively high emission estimates.

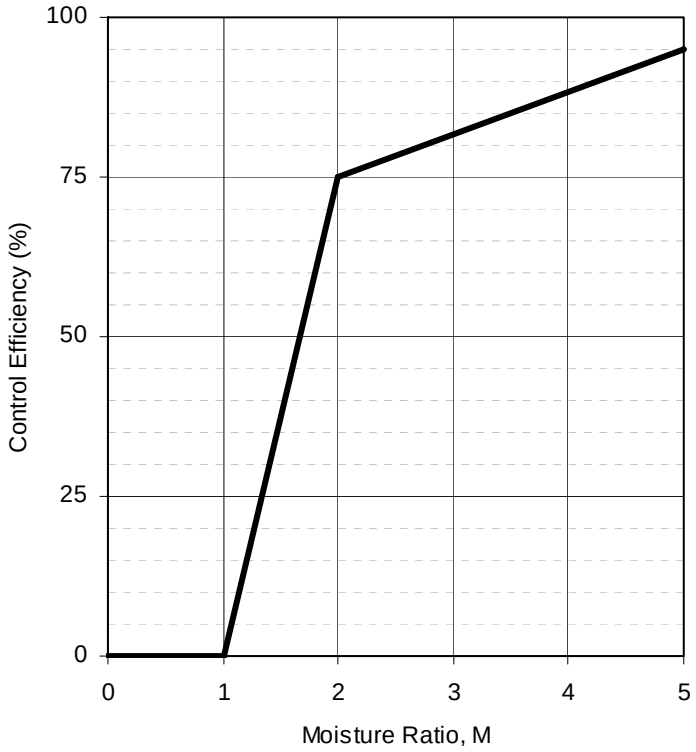


Figure 13.2.2-2. Watering control effectiveness for unpaved travel surfaces

The control effectiveness of chemical dust suppressants appears to depend on (a) the dilution rate used in the mixture; (b) the application rate (volume of solution per unit road surface area); (c) the time between applications; (d) the size, speed and amount of traffic during the period between applications; and (e) meteorological conditions (rainfall, freeze/thaw cycles, etc.) during the period. Other factors that affect the performance of dust suppressants include other traffic characteristics (e. g., cornering, track-on from unpaved areas) and road characteristics (e. g., bearing strength, grade). The variabilities in the above factors and differences between individual dust control products make the control efficiencies of chemical dust suppressants difficult to estimate. Past field testing of emissions from controlled unpaved roads has shown that chemical dust suppressants provide a PM-10 control efficiency of about 80 percent when applied at regular intervals of 2 weeks to 1 month.

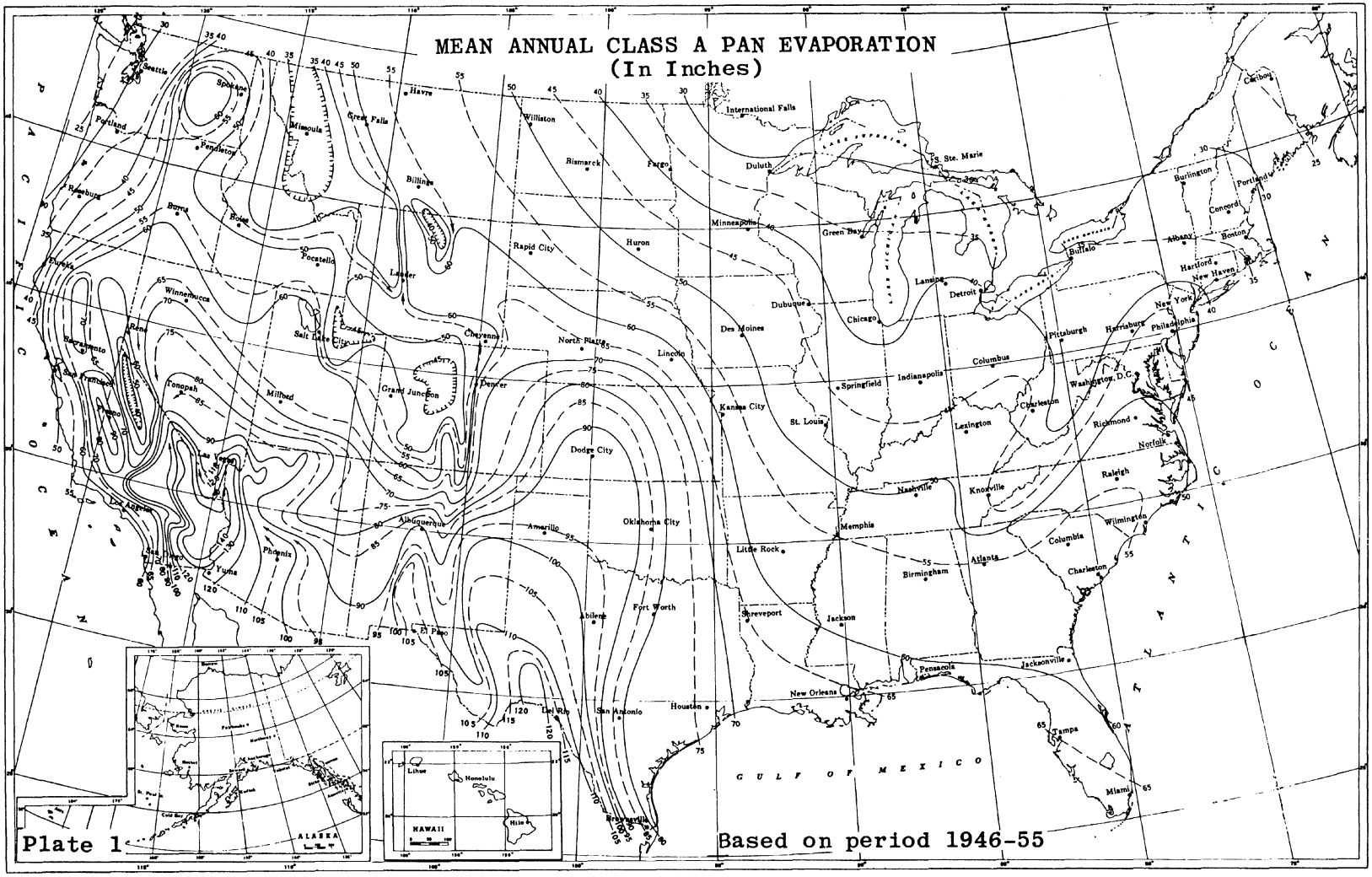


Figure 13.2.2-3. Annual evaporation data.

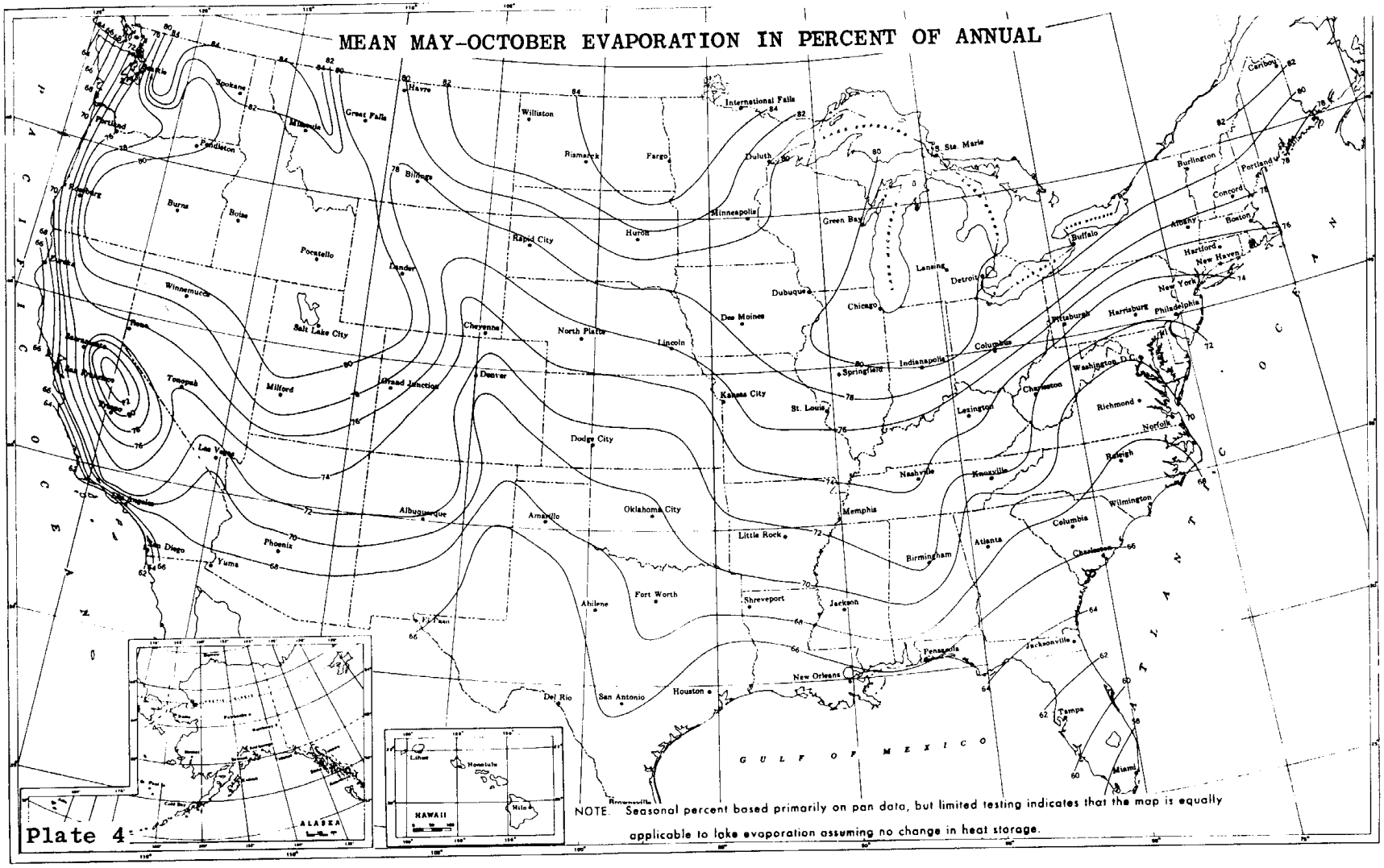


Figure 13.2.2-4. Geographical distribution of the percentage of evaporation occurring between May and October.

Petroleum resin products historically have been the dust suppressants (besides water) most widely used on industrial unpaved roads. Figure 13.2.2-5 presents a method to estimate average control efficiencies associated with petroleum resins applied to unpaved roads.[20] Several items should be noted:

1. The term "ground inventory" represents the total volume (per unit area) of petroleum resin concentrate (*not solution*) applied since the start of the dust control season.

2. Because petroleum resin products must be periodically reapplied to unpaved roads, the use of a time-averaged control efficiency value is appropriate. Figure 13.2.2-5 presents control efficiency values averaged over two common application intervals, 2 weeks and 1 month. Other application intervals will require interpolation.

3. Note that zero efficiency is assigned until the ground inventory reaches 0.05 gallon per square yard (gal/yd^2). Requiring a minimum ground inventory ensures that one must apply a reasonable amount of chemical dust suppressant to a road before claiming credit for emission control. Recall that the ground inventory refers to the amount of petroleum resin concentrate rather than the total solution.

As an example of the application of Figure 13.2.2-5, suppose that Equation 1a was used to estimate an emission factor of 7.1 lb/VMT for PM-10 from a particular road. Also, suppose that, starting on May 1, the road is treated with 0.221 gal/yd^2 of a solution (1 part petroleum resin to 5 parts water) on the first of each month through September. Then, the average controlled emission factors, shown in Table 13.2.2-5, are found.

Table 13.2-2-5. EXAMPLE OF AVERAGE CONTROLLED EMISSION FACTORS FOR SPECIFIC CONDITIONS

Period	Ground Inventory, gal/yd^2	Average Control Efficiency, %[a]	Average Controlled Emission Factor, lb/VMT
May	0.037	0	7.1
June	0.073	62	2.7
July	0.11	68	2.3
August	0.15	74	1.8
September	0.18	80	1.4

[a] From Figure 13.2.2-5, $\leq$10 µm. Zero efficiency assigned if ground inventory is less than 0.05 gal/yd^2. 1 lb/VMT = 281.9 g/VKT. 1 gal/yd^2 = 4.531 L/m^2.

Besides petroleum resins, other newer dust suppressants have also been successful in controlling emissions from unpaved roads. Specific test results for those chemicals, as well as for petroleum resins and watering, are provided in References 18 through 21.

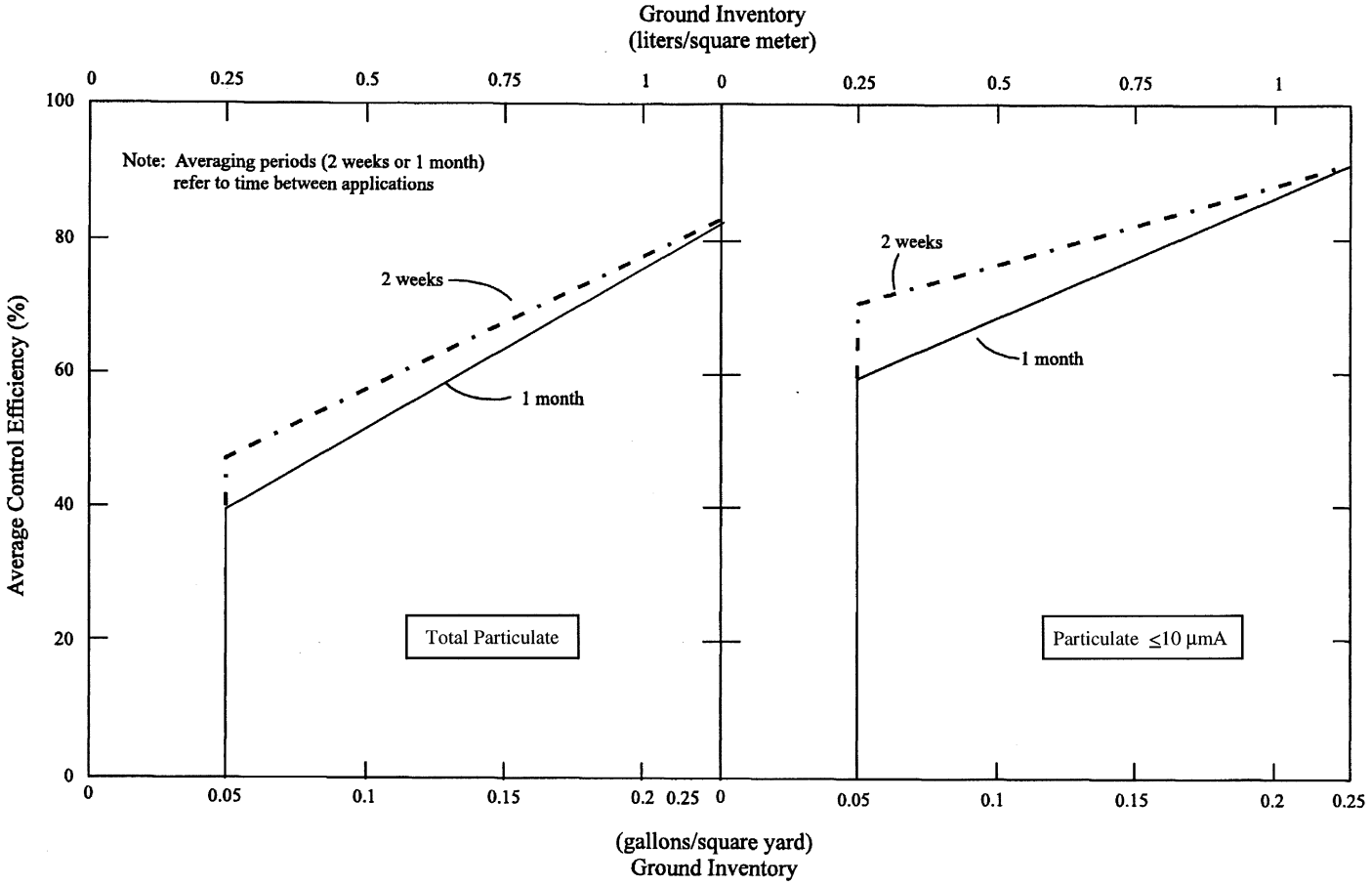


Figure 13.2.2-5. Average control efficiencies over common application intervals.

Fugitive Dust Control Measures Applicable for the WRAP Region

Source Category	Control Measure	Published PM10 Control Efficiency
Agricultural Tilling	Reduce tilling during high winds	1 – 5%
	Roughen surface	15 – 64%
	Modify equipment	50%
	Employ sequential cropping	50%
	Increase soil moisture	90%
	Use other conservation management practices	25 - 100%
Agricultural Harvesting	Limited activity during high winds	5 – 70%
	Modify equipment	50%
	Night farming	10%
	New techniques for drying fruit	25 –60%
Construction/Demolition	Water unpaved surfaces	10 – 74%
	Limit on-site vehicle speed to 15 mph	57%
	Apply dust suppressant to unpaved areas	84%
	Prohibit activities during high winds	98%
Materials Handling	Implement wet suppression	50 – 90%
	Erect 3-sided enclosure around storage piles	75%
	Cover storage pile with a tarp during high winds	90%
Paved Roads	Sweep streets	4 – 26%
	Minimize trackout	40 – 80%
	Remove deposits on road ASAP	> 90%
Unpaved Roads	Limit vehicle speed to 25 mph	44%
	Apply water	10 – 74%
	Apply dust suppressant	84%
	Pave the surface	>90%
Mineral Products Industry	Cyclone or muliclone	68 –79%
	Wet scrubber	78 –98%
	Fabric filter	99 – 99.8%
	Electrostatic precipitator	90 – 99.5%
Abrasive Blasting	Water spray	50 – 93%
	Fabric filter	> 95%
Livestock Husbandry	Daily watering of corrals and pens	> 10%
	Add wood chips or mulch to working pens	> 10%
Wind Erosion (agricultural, open area, and storage piles)	Plant trees or shrubs as a windbreak	25%
	Create cross-wind ridges	24 – 93%
	Erect artificial wind barriers	4 – 88%
	Apply dust suppressant or gravel	84%
	Revegetate; apply cover crop	90%
	Water exposed area before high winds	90%

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DEPARTMENT ACCEPTED VALUES FOR:
AGGREGATE HANDLING, STORAGE PILE, and HAUL ROAD EMISSIONS

TO: Applicants and Air Quality Bureau Permitting Staff

SUBJECT: Department accepted default values for percent silt, wind speed, moisture content, and control efficiencies for haul road control measures

This guidance document provides the Department accepted default values for correction parameters in the emission calculation equations for aggregate handling and storage piles emissions in construction permit applications and notices of intent submitted under 20.2.72 and 20.2.73 NMAC; and the Department accepted control efficiencies for haul road control measures for applications submitted under 20.2.72 NMAC.

Aggregate Handling and Storage Pile Emission Calculations

Applicants should calculate the particulate matter emissions from aggregate handling and storage piles using the EPA's AP-42 Chapter 13.2.4.
http://www3.epa.gov/ttn/chief/ap42/ch13/final/c13s0204.pdf

Equation 1 from Chapter 13.2.4 requires users to input values for two correction parameters, U and M, where U = mean wind speed and M = material moisture content. Below are the accepted values for U and M:

Default Values for Chapter 13.2.4, Equation 1:

Parameter	Default Value
U = Mean wind speed (miles per hour)	11 mph
M = Material moisture content (% water)	2%

Applicants must receive preapproval from the Department if they wish to assume a higher moisture content and/or a lower wind speed in these calculations. Higher moisture contents may require site specific testing either as a permit condition or submitted with the application. Applicants may assume higher wind speeds and lower percent moisture content in their calculations without prior approval from the Department.

Haul Road Emissions and Control Measure Efficiencies

Applicants should calculate the particulate matter emissions from unpaved haul roads using the EPA's AP-42 Chapter 13.2.2. http://www3.epa.gov/ttn/chief/ap42/ch13/final/c13s0202.pdf

Equation 1(a) from Chapter 13.2.2 requires users to input values for two correction parameters, s and W, where s = surface material silt content (%) and W = mean vehicle weight (tons). The applicant should calculate the mean vehicle weight in accordance with the chapter's instructions. Below is the accepted value for the parameter s:

Default Values for Chapter 13.2.2, Equation 1(a):

Parameter	Default Value
s = surface material silt content (%)	4.8%

Applicants may use a higher silt content without prior approval from the Department. Use of a lower silt content requires prior approval from the Department and may require site specific testing in support of the request.

Equation 2 from Chapter 13.2.2 allows users to take credit for the number of days that receive precipitation in excess of 0.01 inches, in the annual emissions calculation, where P = number of days in a year with at least 0.01 inches of precipitation.

Default Values for Chapter 13.2.2, Equation 2:

Parameter	Default Value
P = number of days in a year with at least 0.01 inches of precipitation	70 days

Applications submitted under Part 72 may request to apply control measures to reduce the particulate matter emissions from facility haul roads. Applications submitted under Part 73 may not consider any emission reduction from control measures in the potential emission rate calculation, as registrations issued under Part 73 are not federally enforceable under the Clean Air Act or the New Mexico Air Quality Control Act. In order for those control measures to be federally enforceable, the controls must be a requirement in an air quality permit.

Below are the Department accepted control efficiencies for various haul road control measures:

Haul Road Control Measures and Control Efficiency:

Control Measure	Control Efficiency
None	0%
Base course **or** watering	60%
Base course **and** watering	80%
Base course **and** surfactant	90%
Paved **and** Swept	95%

TCEQ Emission Factors

Development of TNRCC Emission Factors

In 1994, the TNRCC published emission factors primarily based on statistical data from the original study performed by the CMA and EPA in 1983. To achieve higher accuracy for estimating actual emissions from elevated flares, the TNRCC emission factors accounted for the flare type and lower heating value of the relief gas. The emission factors developed by the TNRCC are shown below in Table 1.

Table 1. Emission factors developed by the TNRCC for NOx and CO

Type	Waste Gas	NOx lb/MM Btu of Waste Gas	CO lb/MM Btu of Waste Gas
Steam-Assisted	High Btu (>1000/scf	0.0485	0.3503
Steam-Assisted	Low Btu (192-1000/scf)	0.0680	0.3465
Air and Non-Assisted	High Btu (>1000/scf	0.1380	0.2755
Air and Non-Assisted	Low Btu (184-1000/scf)	0.0641	0.5496

Upon reviewing the statistical data collected during the CMA testing, the emission factors shown in Table 1 reflect an average of the derived NO_x and CO emission factors pertaining to the flare type and lower heating value of the relief gas. When calculating the emission factors for steam-assisted flares relieving a low Btu waste gas and air-assisted flares relieving a high Btu waste gas, all test data collected during the CMA testing was included in the average of the derived emission factors.

In order to calculate emission factors for the remaining categories, multiple tests had to be disregarded due to various reasons. For instance, during testing in the high Btu steam-assisted category, the emission probe was placed into the flare flame during test 67, resulting in a substantial increase in the concentration level of both THC and carbon monoxide. During tests 61 and 55, it was noted that the flare was capped by the assist steam, contributing to destruction efficiencies well below 98%. Omitting tests 67, 61 and 55 from the high Btu steam-assisted waste gas data, the average of the derived NO_x and CO emission factor of the remaining tests resulted in the values shown above in Table 1.

To calculate the emission factor for air and non-assisted flares relieving low Btu waste gas, certain CMA test data were excluded in the calculation performed by TNRCC. Upon detailed review of the CMA test data, one possible method for calculating the emission factors in Table 1 entails disregarding tests 66, 29, 29a, 29b, and 62. Reasoning for this assumption may be due to the lower heating value of the relief gas being below 184 Btu/SCF. However, data from test 33 appears to be included in the overall average

Table II: Facility/Compound Specific Fugitive Emission Factors

Equipment/Service	Compound Specific See Section I for more information			Facility Specific[1]					
	Ethylene Oxide[2] w/LDAR	Phosgene[3] w/LDAR	Butadiene w/LDAR[4]	Petroleum Marketing Terminal[5, 6] w/28PET	Oil and Gas ProductionOperation[6]				Refinery[6]
					Gas	Heavy Oil < 20 API	Light Oil	Water/ Light Oil	
Valves					0.00992	0.0000185	0.0055	0.000216	
Gas/Vapor	0.000444	0.00000216	0.001105	0.0000287					0.059
Light Liquid	0.00055	0.00000199	0.00314	0.0000948					0.024
Heavy Liquid				0.0000948					0.00051
Pumps	0.042651	0.0000201	0.05634		0.00529	0.00113[7]	0.02866	0.000052	
Light Liquid				0.00119					0.251
Heavy Liquid				0.00119					0.046
Flanges/Connectors[11]	0.000555	0.00000011	0.000307		0.00086	0.00000086	0.000243	0.000006	0.00055
					0.00044	0.0000165	0.000463	0.000243	
Gas/Vapor				0.000092604					
Light Liquid				0.00001762					
Heavy Liquid				0.0000176					
Compressors	0.000767		0.000004		0.0194	0.0000683	0.0165	0.0309	1.399
Relief Valve	0.000165	0.0000162	0.02996		0.0194	0.0000683	0.0165	0.0309	0.35
Open-ended Lines[8]	0.001078	0.00000007	0.00012		0.00441	0.000309	0.00309	0.00055	0.0051
Sampling[9]	0.000088		0.00012						0.033
Other[10]					0.0194	0.0000683	0.0165	0.0309	
Gas/Vapor				0.000265					
Light/Heavy Liquid				0.000287					
Process Drains					0.0194	0.0000683	0.0165	0.0309	0.07

Endnotes Table II

1. **Factors give the total organic compound emission rate. Multiply by the weight percent of non-methane, non-ethane organics to get the VOC emission rate.**
2. **These emission factors require the use of the 28MID fugitive program. Monitoring must occur at a leak definition of 500 ppmv. No additional control credit can be applied to these factors except 28CNTQ and 28CNTA. Emission factors are from EOIC Fugitive Emission Study, summer 1988.**
3. **These emission factors require the use of the 28MID fugitive program. Monitoring must occur at a leak definition of 50 ppmv. No additional control credit can be applied to these factors. Emission factors are from Phosgene Panel Study, summer 1988.**
4. **These emission factors require the use of the 28MID fugitive program. Monitoring must occur at a leak definition of 100 ppmv. No additional control credit can be applied to these factors. Emission factors are from Randall, J. L., et al., Radian Corporation. Fugitive Emissions from the 1,3-butadiene Production Industry: A Field Study. Final Report. Prepared for the 1,3-Butadiene Panel for the Chemical Manufacturers Association. April 1989.**
5. **Control credit is included in the factor; no additional control credit can be applied to these factors. Monthly 28 PET inspection is required.**
6. **Factors are taken from EPA Document EPA-453/R-95-017, November 1995, pages 2-13, 2-14, and 2-15.**
7. **Heavy liquid oil – Pump factor was not derived during the API study. The factor is the SOCMI without C_2 Heavy Liquid – Pump factor with a 93% reduction credit for the physical inspection.**

Table III: Leak Detection and Repair (LDAR) Program Instrument Monitoring Options

LDAR Program	28M	28RCT	28VHP	28MID	28LAER	28CNTQ	28CNTA
Leak Definition for Pumps and Compressors	10,000 ppmv	10,000 ppmv	2,000 ppmv	500 ppmv	500 ppmv	N/A	N/A
Leak Definition for All Other Components	10,000 ppmv	500 ppmv	500 ppmv	500 ppmv	500 ppmv	500 ppmv	500 ppmv
Applicable Vapor Pressure	>0.5 psia at 100°F	>0.044 psia at 68°F	>0.044 psia at 68°F	>0.044 psia at 68°F	>0.044 psia at 68°F	>0.044 psia at 68°F	>0.044 psia at 68°F
Monitoring Frequency	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Annually
Directed/Nondirected Maintenance	Nondirected	Nondirected	Nondirected	Directed	Directed	Nondirected	Nondirected
Most Common State/Federal Programs with Similar Requirements	40 CFR Part 60 Subpart VV 40 CFR Part 61 30 TAC §115.322	30 TAC §115.352[1]	40 CFR Part 60 Subpart VVa 40 CFR Part 63 Subparts H, CC	N/A	Nonattainment NSR	N/A	40 CFR Part 60Subpart VVa, 40 CFR Part 63 Subparts H, CC

Endnotes Table III

[1] **Except in Gregg, Nueces, and Victoria Counties where 28M applies.**

Table V: Control Efficiencies for LDAR

Equipment/Service	28M	28RCT	28VHP	28MID	28LAER	28CNTQ	28CNTA	28PI	28AVO[9]
Valves[1]									97%
Gas/Vapor	75%	97%	97%	97%	97%			30%	
Light Liquid	75%	97%	97%	97%	97%			30%	
Heavy Liquid[5]	0%[6]	0%[6]	0%[6]	0%[6]	30%[6, 8]			30%[8]	
Pumps[1]									93%
Light Liquid	75%	75%	85%	93%	93%			30%	
Heavy Liquid[5]	0%	0%[7]	0%[7]	0%[8, 10]	30%[8]			30%[8]	
Flanges/Connectors[1]	30%	30%	30%	30%				30%	97%
Gas/Vapor					97%	97%	75%		
Light Liquid					97%	97%	75%		
Heavy Liquid[8]					30%	30%	30%		
Compressors[1]	75%	75%	85%	95%	95%			30%	95%
Relief Valves[1, 2] (Gas/Vapor)	75%	97%	97%	97%	97%			30%	97%
Sampling Connection[3] (pounds per hour per sample taken)	0%	0%	0%	0%	0%			0%	0%
Open Ended Lines[1, 4]									

It should be noted in the application and added to the permit conditions if any of the footnotes are applicable. For example, if components in heavy liquid service are monitored, then the application should include the monitored concentration and the concentration of saturation, in ppmv and such monitoring will be added as a separate condition.

Endnotes Table V

1 **Control efficiencies apply only to components that are actually monitored. Control efficiencies do not apply to components that are difficult or unsafe-to-monitor on the standard schedule. However, difficult-to-monitor gas or light liquid valves under the 28RCT, 28VHP, 28MID, or 28LAER programs that are monitored once per year may apply a 75% reduction credit.**

2 **100% control may be taken if a relief valve vents to an operating control device or if it is equipped with a rupture disc and a pressure-sensing device between the valve and disc to monitor for disc integrity. For new facilities, BACT guidelines generally require that all relief valves vent to a control device. When there are safety reasons that the relief valve cannot achieve 100% control, the relief valve can be monitored under the LDAR programs for the credit listed. This monitoring must be performed regardless of whether the relief valve is considered accessible, difficult-to-monitor or unsafe-to-monitor. Relief valves that do not achieve 100% control should not be built in locations that are unsafe-to-monitor.**

3 **Sampling connection control efficiencies are covered under other equipment and services. Sampling emissions are based on the number of samples taken per year as opposed to the number of connections. Fugitives for a closed loop sampling system are based on the component count.**

4 **Good design criteria for special chemicals handling and most LDAR programs require open-ended lines to be equipped with an appropriately sized cap, blind flange, plug, or a second valve. If so equipped, open-ended lines may be given a 100% control credit. Regardless of the lines given 100% credit, these lines should be mentioned in permit applications. Exceptions to the LDAR program criteria may be made for safety reasons with the approval of TCEQ management.**

40 CFR 98 Emission Factors

Displaying title 40, up to date as of 8/24/2023. Title 40 was last amended 8/24/2023.

Title 40 —Protection of Environment
Chapter I —Environmental Protection Agency
Subchapter C —Air Programs
Part 98 —Mandatory Greenhouse Gas Reporting
Subpart C —General Stationary Fuel Combustion Sources

Table C–1 to Subpart C of Part 98—Default CO_2 Emission Factors and High Heat Values for Various Types of Fuel

Default CO_2 Emission Factors and High Heat Values for Various Types of Fuel

Fuel type	Default high heat value	Default CO_2 emission factor
Coal and coke	mmBtu/short ton	kg CO_2/mmBtu
Anthracite	25.09	103.69
Bituminous	24.93	93.28
Subbituminous	17.25	97.17
Lignite	14.21	97.72
Coal Coke	24.80	113.67
Mixed (Commercial sector)	21.39	94.27
Mixed (Industrial coking)	26.28	93.90
Mixed (Industrial sector)	22.35	94.67
Mixed (Electric Power sector)	19.73	95.52
Natural gas	mmBtu/scf	kg CO_2/mmBtu
(Weighted U.S. Average)	1.026×10^{-3}	53.06
Petroleum products—liquid	mmBtu/gallon	kg CO_2/mmBtu
Distillate Fuel Oil No. 1	0.139	73.25
Distillate Fuel Oil No. 2	0.138	73.96
Distillate Fuel Oil No. 4	0.146	75.04
Residual Fuel Oil No. 5	0.140	72.93
Residual Fuel Oil No. 6	0.150	75.10
Used Oil	0.138	74.00

Fuel type	Default high heat value	Default CO_2 emission factor
Kerosene	0.135	75.20
Liquefied petroleum gases (LPG)[1]	0.092	61.71
Propane[1]	0.091	62.87
Propylene[2]	0.091	67.77
Ethane[1]	0.068	59.60
Ethanol	0.084	68.44
Ethylene[2]	0.058	65.96
Isobutane[1]	0.099	64.94
Isobutylene[1]	0.103	68.86
Butane[1]	0.103	64.77
Butylene[1]	0.105	68.72
Naphtha (<401 deg F)	0.125	68.02
Natural Gasoline	0.110	66.88
Other Oil (>401 deg F)	0.139	76.22
Pentanes Plus	0.110	70.02
Petrochemical Feedstocks	0.125	71.02
Special Naphtha	0.125	72.34
Unfinished Oils	0.139	74.54
Heavy Gas Oils	0.148	74.92
Lubricants	0.144	74.27
Motor Gasoline	0.125	70.22
Aviation Gasoline	0.120	69.25
Kerosene-Type Jet Fuel	0.135	72.22
Asphalt and Road Oil	0.158	75.36
Crude Oil	0.138	74.54
Petroleum products—solid	mmBtu/short ton	kg CO_2/mmBtu.
Petroleum Coke	30.00	102.41.

Fuel type	Default high heat value	Default CO_2 emission factor
Petroleum products—gaseous	mmBtu/scf	kg CO_2/mmBtu.
Propane Gas	2.516×10^{-3}	61.46.
Other fuels—solid	mmBtu/short ton	kg CO_2/mmBtu
Municipal Solid Waste	9.95[3]	90.7
Tires	28.00	85.97
Plastics	38.00	75.00
Other fuels—gaseous	mmBtu/scf	kg CO_2/mmBtu
Blast Furnace Gas	0.092×10^{-3}	274.32
Coke Oven Gas	0.599×10^{-3}	46.85
Fuel Gas[4]	1.388×10^{-3}	59.00
Biomass fuels—solid	mmBtu/short ton	kg CO_2/mmBtu
Wood and Wood Residuals (dry basis)[5]	17.48	93.80
Agricultural Byproducts	8.25	118.17
Peat	8.00	111.84
Solid Byproducts	10.39	105.51
Biomass fuels—gaseous	mmBtu/scf	kg CO_2/mmBtu
Landfill Gas	0.485×10^{-3}	52.07
Other Biomass Gases	0.655×10^{-3}	52.07
Biomass Fuels—Liquid	mmBtu/gallon	kg CO_2/mmBtu
Ethanol	0.084	68.44
Biodiesel (100%)	0.128	73.84
Rendered Animal Fat	0.125	71.06
Vegetable Oil	0.120	81.55

[1] The HHV for components of LPG determined at 60 °F and saturation pressure with the exception of ethylene.

[2] Ethylene HHV determined at 41 °F (5 °C) and saturation pressure.

[3] Use of this default HHV is allowed only for: (a) Units that combust MSW, do not generate steam, and are allowed to use Tier 1; (b) units that derive no more than 10 percent of their annual heat input from MSW and/or tires; and (c) small batch incinerators that combust no more than 1,000 tons of MSW per year.

[4] Reporters subject to subpart X of this part that are complying with § 98.243(d) or subpart Y of this part may only use the default HHV and the default CO_2 emission factor for fuel gas combustion under the conditions prescribed in § 98.243(d)(2)(i) and (d)(2)(ii) and § 98.252(a)(1) and (a)(2), respectively. Otherwise, reporters subject to subpart X or subpart Y shall use either Tier 3 (Equation C–5) or Tier 4.

[5] Use the following formula to calculate a wet basis HHV for use in Equation C–1: $HHV_w = ((100 - M)/100)*HHV_d$ where HHV_w = wet basis HHV, M = moisture content (percent) and HHV_d = dry basis HHV from Table C–1.

[78 FR 71950, Nov. 29, 2013, as amended at 81 FR 89252, Dec. 9, 2016]

Title 40 —Protection of Environment
Chapter I —Environmental Protection Agency
Subchapter C —Air Programs
Part 98 —Mandatory Greenhouse Gas Reporting
Subpart C —General Stationary Fuel Combustion Sources

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}
Other Fuels—Solid	3.2×10^{-02}	4.2×10^{-03}
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.

[78 FR 71952, Nov. 29, 2013, as amended at 81 FR 89252, Dec. 9, 2016]

40 CFR § 98.233 - Calculating GHG emissions.

CFR

§ 98.233 Calculating GHG emissions.

You must calculate and report the annual GHG emissions as prescribed in this section. For calculations that specify measurements in actual conditions, reporters may use a flow or volume measurement system that corrects to standard conditions and determine the flow or volume at standard conditions; otherwise, reporters must use average atmospheric conditions or typical operating conditions as applicable to the respective monitoring methods in this section.

(a) ***Natural gas pneumatic device venting.*** Calculate CH^4 and CO^2 volumetric emissions from continuous high bleed, continuous low bleed, and intermittent bleed natural gas pneumatic devices using Equation W–1 of this section.

$$E_{s,i} = \sum_{i=1}^{3} \text{Count}_i * \text{EF}_i * \text{GHG}_i * T_i \quad \text{(Eq. W-1)}$$

Where:

(4) Calculate both CH^4 and CO^2 volumetric and mass emissions from volumetric natural gas emissions using calculations in paragraphs (u) and (v) of this section.

(5) Calculate emissions from associated natural gas if emissions are routed to a flare as specified in paragraphs (m)(5)(i) and (ii) of this section.

(i) Use the associated natural gas volume and gas composition as determined in paragraph (m)(1) through (4) of this section.

(ii) Use the calculation method of flare stacks in paragraph (n) of this section to determine associated gas emissions from the flare.

(n) ***Flare stack emissions.*** Calculate CO^2, CH^4, and N^2O emissions from a flare stack as specified in paragraphs (n)(1) through (9) of this section.

(1) If you have a continuous flow measurement device on the flare, you must use the measured flow volumes to calculate the flare gas emissions. If all of the flare gas is not measured by the existing flow measurement device, then the flow not measured can be estimated using engineering calculations based on best available data or company records. If you do not have a continuous flow measurement device on the flare, you can use engineering calculations based on process knowledge, company records, and best available data.

(2) If you have a continuous gas composition analyzer on gas to the flare, you must use these compositions in calculating emissions. If you do not have a continuous gas composition analyzer on gas to the flare, you must use the appropriate gas compositions for each stream of hydrocarbons going to the flare as specified in paragraphs (n)(2)(i) through (iii) of this section.

(i) For onshore natural gas production and onshore petroleum and natural gas gathering and boosting, determine the GHG mole fraction using paragraph (u)(2)(i) of this section.

(ii) For onshore natural gas processing, when the stream going to flare is natural gas, use the GHG mole fraction in feed natural gas for all streams upstream of the de-methanizer or dew point control, and GHG mole fraction in facility specific residue gas to transmission pipeline systems for all emissions sources downstream of the de-methanizer overhead or dew point control for onshore natural gas processing facilities. For onshore natural gas processing plants that solely fractionate a liquid stream, use the GHG mole fraction in feed natural gas liquid for all streams.

(iii) For any industry segment required to report to flare stack emissions under § 98.232, when the stream going to the flare is a hydrocarbon product stream, such as methane, ethane, propane, butane, pentane-plus and mixed light

hydrocarbons, then you may use a representative composition from the source for the stream determined by engineering calculation based on process knowledge and best available data.

(3) Determine flare combustion efficiency from manufacturer. If not available, assume that flare combustion efficiency is 98 percent.

(4) Convert GHG volumetric emissions to standard conditions using calculations in paragraph (t) of this section.

(5) Calculate GHG volumetric emissions from flaring at standard conditions using Equations W–19 and W–20 of this section.

$$E_{s,\,CH4} = V_s * X_{CH4} * [(1-\eta) * Z_L + Z_U] \quad \text{(Eq. W-19)}$$

$$E_{s,\,CO2} = V_s * X_{CO2} + \sum_{j=1}^{5} (\eta \times V_s \times Y_j \times R_j \times Z_L) \quad \text{(Eq. W-20)}$$

Where:
$E^{s,CH4}$ = Annual CH^4 emissions from flare stack in cubic feet, at standard conditions.
$E^{s,CO2}$ = Annual CO^2 emissions from flare stack in cubic feet, at standard conditions.
V^s = Volume of gas sent to flare in standard cubic feet, during the year as determined in paragraph (n)(1) of this section.
η = Flare combustion efficiency, expressed as fraction of gas combusted by a burning flare (default is 0.98).
X^{CH4} = Mole fraction of CH^4 in the feed gas to the flare as determined in paragraph (n)(2) of this section.
X^{CO2} = Mole fraction of CO^2 in the feed gas to the flare as determined in paragraph (n)(2) of this section.
Z^U = Fraction of the feed gas sent to an un-lit flare determined by engineering estimate and process knowledge based on best available data and operating records.
Z^L = Fraction of the feed gas sent to a burning flare (equal to $1 - Z^U$).
Y^j = Mole fraction of hydrocarbon constituents j (such as methane, ethane, propane, butane, and pentanes-plus) in the feed gas to the flare as determined in paragraph (n)(1) of this section.
R^j = Number of carbon atoms in the hydrocarbon constituent j in the feed gas to the flare: 1 for methane, 2 for ethane, 3 for propane, 4 for butane, and 5 for pentanes-plus).

(6) Calculate both CH^4 and CO^2 mass emissions from volumetric emissions using calculation in paragraph (v) of this section.

(7) Calculate N^2O emissions from flare stacks using Equation W–40 in paragraph (z) of this section.

(8) If you operate and maintain a CEMS that has both a CO^2 concentration monitor and volumetric flow rate monitor for the combustion gases from the flare, you must calculate only CO^2 emissions for the flare. You must follow the Tier 4 Calculation Method and all associated calculation, quality assurance, reporting, and recordkeeping requirements for Tier 4 in subpart C of this part (General Stationary Fuel Combustion Sources). If a CEMS is used to calculate flare stack emissions, the requirements specified in paragraphs (n)(1) through (7) of this section are not required.

(9) The flare emissions determined under this paragraph (n) must be corrected for flare emissions calculated and reported under other paragraphs of this section to avoid double counting of these emissions.

(o) ***Centrifugal compressor venting.*** If you are required to report emissions from centrifugal compressor venting as specified in § 98.232(d)(2), (e)(2), (f)(2), (g)(2), and (h)(2), you must conduct volumetric emission measurements specified in paragraph (o)(1) of this section using methods specified in paragraphs (o)(2) through (5) of this section; perform calculations specified in paragraphs (o)(6) through (9) of this section; and calculate CH^4 and CO^2 mass emissions as specified in paragraph (o)(11) of this section. If emissions from a compressor source are routed to a flare, paragraphs (o)(1) through (11) do not apply and instead you must calculate CH^4, CO^2, and N^2O emissions as specified in paragraph (o)(12) of this section. If emissions from a compressor source are captured for fuel use or are routed to a thermal oxidizer, paragraphs (o)(1) through (12) do not apply and instead you must calculate and report emissions as specified in subpart C of this part. If emissions from a compressor source are routed to vapor recovery, paragraphs (o)(1) through (12) do not apply. If you are required to report emissions from centrifugal compressor venting at an onshore petroleum and natural gas production facility as specified in § 98.232(c)(19) or an onshore petroleum and natural gas gathering and boosting facility as specified in § 98.232(j)(8), you must calculate volumetric emissions as specified in paragraph (o)(10); and calculate CH^4 and CO^2 mass emissions as specified in paragraph (o)(11).

(1) ***General requirements for conducting volumetric emission measurements.*** You must conduct volumetric emission measurements on each centrifugal compressor as specified in this paragraph. Compressor sources (as defined in § 98.238) without manifolded vents must use a measurement method specified in paragraph (o)(1)(i) or (ii) of this section. Manifolded compressor sources (as defined in § 98.238) must use a measurement method specified in paragraph (o)(1)(i), (ii), (iii), or (iv) of this section.

(i) Centrifugal compressor source as found measurements. Measure venting from each compressor according to either paragraph (o)(1)(i)(A) or (B) of this section at least once annually, based on the compressor mode (as defined in § 98.238) in

Engine Specifications – CAT 3606s

G3606

GAS ENGINE SITE SPECIFIC TECHNICAL DATA
Eric Miller - Northwind 3606 Compressors

CATERPILLAR®

GAS COMPRESSION APPLICATION			
ENGINE SPEED (rpm):	1000	RATING STRATEGY:	GEN 2 KIT - HIGH ALTITUDE - NO CCV
COMPRESSION RATIO:	7.6	RATING LEVEL:	CONTINUOUS
AFTERCOOLER TYPE:	SCAC	FUEL SYSTEM:	GAV
AFTERCOOLER - STAGE 1/STAGE 2 INLET (°F):	174 / 130		WITH AIR FUEL RATIO CONTROL
JACKET WATER OUTLET (°F):	190	**SITE CONDITIONS:**	
ASPIRATION:	TA	FUEL:	Northwind TItan Fuel
COOLING SYSTEM:	JW+1AC, OC+2AC	FUEL PRESSURE RANGE(psia): (See note 1)	84.8-94.6
CONTROL SYSTEM:	ADEM4	FUEL METHANE NUMBER:	89.4
EXHAUST MANIFOLD:	DRY	FUEL LHV (Btu/scf):	922
COMBUSTION:	LOW EMISSION	ALTITUDE(ft):	3375
NOx EMISSION LEVEL (g/bhp-hr NOx):	0.3	STANDARD RATED POWER:	2065 bhp@1000rpm
SET POINT TIMING:	18		

				MAX RATING	SITE RATING AT MAX INLET AIR TEMP		
RATING		**NOTES**	**LOAD**	**100%**	**100%**	**75%**	**50%**
ENGINE POWER	(WITHOUT FAN)	(2)	bhp	2065	2065	1549	1033
INLET AIR TEMPERATURE			°F	105	105	105	105
ENGINE DATA							
FUEL CONSUMPTION (LHV)		(3)	Btu/bhp-hr	6817	6817	7113	7659
FUEL CONSUMPTION (HHV)		(3)	Btu/bhp-hr	7563	7563	7892	8497
AIR FLOW (@inlet air temp, 14.7 psia)	(WET)	(4)(5)	ft3/min	5536	5536	4206	2877
AIR FLOW	(WET)	(4)(5)	lb/hr	23329	23329	17724	12125
FUEL FLOW (60°F, 14.7 psia)			scfm	254	254	199	143
INLET MANIFOLD PRESSURE		(6)	psi(abs)	57.0	57.0	43.7	30.6
EXHAUST TEMPERATURE - ENGINE OUTLET		(7)	°F	775	775	852	929
EXHAUST GAS FLOW (@engine outlet temp, 14.5 psia)	(WET)	(5)(8)	ft3/min	12901	12901	10426	7570
EXHAUST GAS MASS FLOW	(WET)	(5)(8)	lb/hr	24009	24009	18256	12507
EMISSIONS DATA - EXHAUST OUT							
NOx (as NO2)		(9)(10)	g/bhp-hr	0.30	0.30	0.30	0.30
CO		(9)(10)	g/bhp-hr	2.15	2.15	2.15	2.14
NMHC (mol. wt. of 15.84)		(9)(10)	g/bhp-hr	0.28	0.28	0.29	0.31
NMNEHC (VOCs) (mol. wt. of 15.84)		(9)(10)(11)	g/bhp-hr	0.19	0.19	0.19	0.21
HCHO (Formaldehyde)		(9)(10)	g/bhp-hr	0.14	0.14	0.14	0.16
CH4 (mol. wt. of 16.04)	(NOMINAL)	(9)(12)	g/bhp-hr	2.39	2.39	2.47	2.61
CO2	(NOMINAL)	(9)(12)	g/bhp-hr	402	402	417	452
EXHAUST OXYGEN	(NOMINAL)	(9)(13)	% DRY	11.1	11.1	11.0	10.6
HEAT REJECTION							
HEAT REJ. TO JACKET WATER (JW)		(14)	Btu/min	24996	24996	21046	17921
HEAT REJ. TO ATMOSPHERE		(14)	Btu/min	6405	6405	5891	5503
HEAT REJ. TO LUBE OIL (OC)		(14)	Btu/min	11732	11732	11201	9754
HEAT REJ. TO A/C - STAGE 1 (1AC)		(14)(15)	Btu/min	23965	23965	12704	4459
HEAT REJ. TO A/C - STAGE 2 (2AC)		(14)(15)	Btu/min	11126	11126	6653	3130

COOLING SYSTEM SIZING CRITERIA			
TOTAL JACKET WATER CIRCUIT (JW+1AC)	(15)(16)	Btu/min	52659
TOTAL STAGE 2 AFTERCOOLER CIRCUIT (OC+2AC)	(15)(16)	Btu/min	25761
A cooling system safety factor of 0% has been added to the cooling system sizing criteria.			

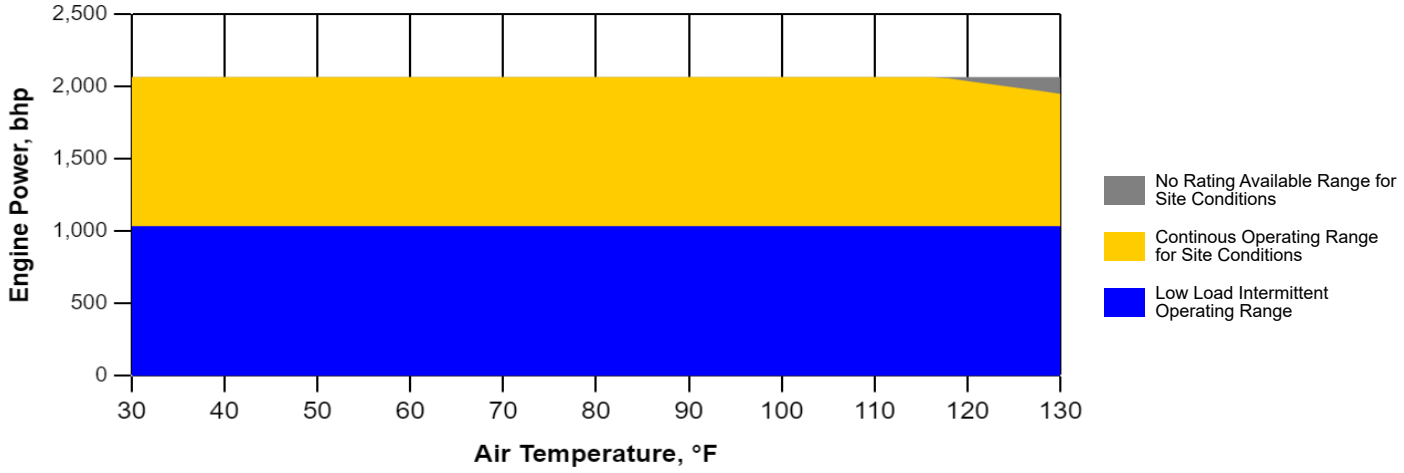
CONDITIONS AND DEFINITIONS

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

For notes information consult page three.

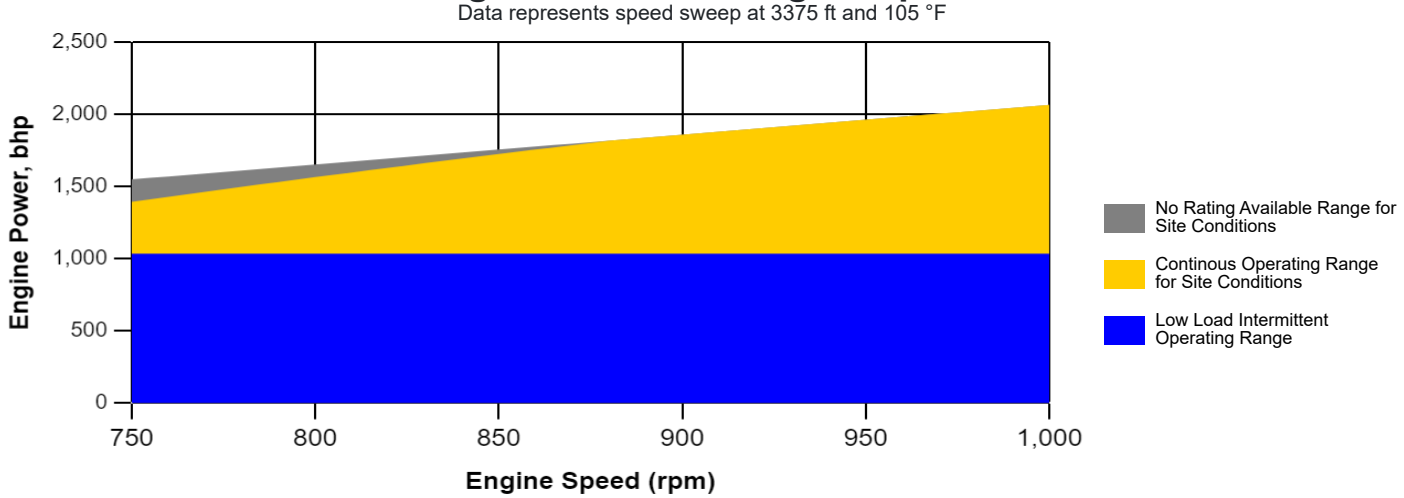
Engine Power vs. Inlet Air Temperature

Data represents temperature sweep at 3375 ft and 1000 rpm



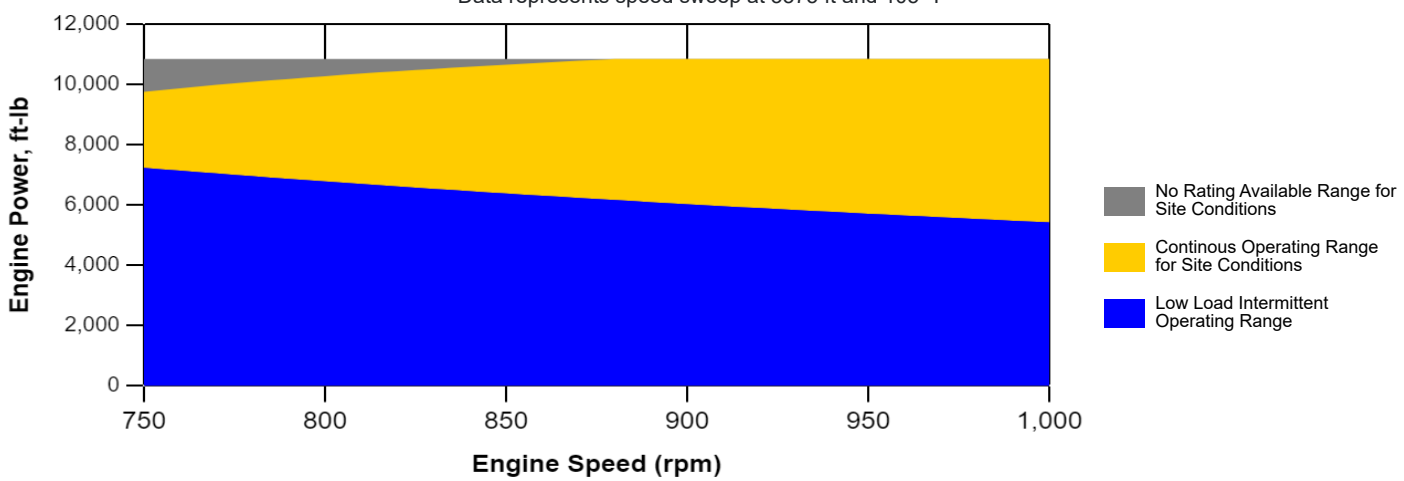
Engine Power vs. Engine Speed

Data represents speed sweep at 3375 ft and 105 °F



Engine Torque vs. Engine Speed

Data represents speed sweep at 3375 ft and 105 °F



Note:
At site conditions of 3375 ft and 105°F inlet air temp., constant torque can be maintained down to 885 rpm. The minimum speed for loading at these conditions is 750 rpm.

NOTES:

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

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

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

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

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

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

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

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

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

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

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

12. CO2 tolerance is ± 2.5%. CH4 tolerance is ± 26.0%. Fuel methane number cannot vary more than ± 3.

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

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

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

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

GAS ENGINE SITE SPECIFIC TECHNICAL DATA
Eric Miller - Northwind 3606 Compressors

Constituent	Abbrev	Mole %	Norm
Water Vapor	H2O	0.0000	0.0000
Methane	CH4	95.3839	95.3839
Ethane	C2H6	2.2605	2.2605
Propane	C3H8	0.4051	0.4051
Isobutane	iso-C4H10	0.0640	0.0640
Norbutane	nor-C4H10	0.0710	0.0710
Isopentane	iso-C5H12	0.0260	0.0260
Norpentane	nor-C5H12	0.0010	0.0010
Hexane	C6H14	0.0190	0.0190
Heptane	C7H16	0.0140	0.0140
Nitrogen	N2	0.6322	0.6322
Carbon Dioxide	CO2	1.1233	1.1233
Hydrogen Sulfide	H2S	0.0000	0.0000
Carbon Monoxide	CO	0.0000	0.0000
Hydrogen	H2	0.0000	0.0000
Oxygen	O2	0.0000	0.0000
Helium	HE	0.0000	0.0000
Neopentane	neo-C5H12	0.0000	0.0000
Octane	C8H18	0.0000	0.0000
Nonane	C9H20	0.0000	0.0000
Ethylene	C2H4	0.0000	0.0000
Propylene	C3H6	0.0000	0.0000
TOTAL (Volume %)		100.0000	100.0000

Fuel Makeup:	Northwind TItan Fuel
Unit of Measure:	English

Calculated Fuel Properties:

Caterpillar Methane Number:	89.4
Lower Heating Value (Btu/scf):	922
Higher Heating Value (Btu/scf):	1023
WOBBE Index (BTU/scfm):	1205
THC: Free Inert Ratio:	55.96
Total % Inerts (% N2,CO2,He):	1.76%
RPC (%) (To 905 Btu/scf Fuel):	100%
Compressibility Factor:	0.998
Stoich A/F Ratio (Vol/Vol):	9.63
Stoich A/F Ratio (Mass/Mass):	16.44
Specific Gravity (Relative to Air):	0.586
Fuel Specific Heat Ratio (K):	1.311

CONDITIONS AND DEFINITIONS

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

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

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

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

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

FUEL LIQUIDS

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

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

Catalyst Element (Table 1A)		
Application	Gas Compression	
Engine Model	CAT G3606A4	
Engine Mechanical Power	2065 hp	
Fuel	Natural Gas (PQNG)	
Exhaust Flowrate	24009 lb/hr	
Exhaust Temperature	775 deg. F	
Silencer Model	ARC1T6-18/24HGS	
Catalyst Model	DC1T	
Catalyst Part Number	A70TL-01-040F-01T3-02	
Number of Elements	3	
Catalyst Code	0F / 300 cpsi	
Pre-Catalyst Emissions g/bhp-h	NOx	0.30
	CO	2.15
	NMNEHC	0.19
	CH2O	0.14
Post-Catalyst g/bhp-h	NOx	0.30
	CO	0.25
	NMNEHC (VOC)	0.19
	CH2O	0.03
Limited Warranty	(doc. X0000-0000-K1) 1 year or 8000 hours operation, whichever first	

Engine Specifications – CAT 3516J

G3516J

GAS ENGINE SITE SPECIFIC TECHNICAL DATA
{Scratch Project}

CATERPILLAR®

GAS COMPRESSION APPLICATION	
ENGINE SPEED (rpm):	1400
COMPRESSION RATIO:	8
AFTERCOOLER TYPE:	SCAC
AFTERCOOLER - STAGE 2 INLET (°F):	130
AFTERCOOLER - STAGE 1 INLET (°F):	201
JACKET WATER OUTLET (°F):	210
ASPIRATION:	TA
COOLING SYSTEM:	JW+OC+1AC, 2AC
CONTROL SYSTEM:	ADEM3
EXHAUST MANIFOLD:	ASWC
COMBUSTION:	LOW EMISSION
NOx EMISSION LEVEL (g/bhp-hr NOx):	0.5
SET POINT TIMING:	30

RATING STRATEGY:	STANDARD
RATING LEVEL:	CONTINUOUS
FUEL SYSTEM:	CAT WIDE RANGE WITH AIR FUEL RATIO CONTROL

SITE CONDITIONS:

FUEL:	Gas Analysis
FUEL PRESSURE RANGE(psig): (See note 1)	7.0-40.0
FUEL METHANE NUMBER:	92.8
FUEL LHV (Btu/scf):	904
ALTITUDE(ft):	3375
INLET AIR TEMPERATURE(°F):	110
STANDARD RATED POWER:	1380 bhp@1400rpm

				MAXIMUM RATING	SITE RATING AT MAXIMUM INLET AIR TEMPERATURE		
RATING		**NOTES**	**LOAD**	**100%**	**100%**	**75%**	**50%**
ENGINE POWER	(WITHOUT FAN)	(2)	bhp	1380	1380	1035	690
INLET AIR TEMPERATURE			°F	110	110	110	110
ENGINE DATA							
FUEL CONSUMPTION (LHV)		(3)	Btu/bhp-hr	7374	7374	7741	8320
FUEL CONSUMPTION (HHV)		(3)	Btu/bhp-hr	8182	8182	8588	9231
AIR FLOW (@inlet air temp, 14.7 psia)	(WET)	(4)(5)	ft3/min	3301	3301	2522	1732
AIR FLOW	(WET)	(4)(5)	lb/hr	13789	13789	10537	7235
FUEL FLOW (60°F, 14.7 psia)			scfm	188	188	148	106
INLET MANIFOLD PRESSURE		(6)	psi(abs)	44.0	44.0	35.1	24.1
EXHAUST TEMPERATURE - ENGINE OUTLET		(7)	°F	813	813	811	867
EXHAUST GAS FLOW (@engine outlet temp, 14.5 psia)	(WET)	(5)(8)	ft3/min	7953	7953	6080	4370
EXHAUST GAS MASS FLOW	(WET)	(5)(8)	lb/hr	14283	14283	10925	7514
EMISSIONS DATA - ENGINE OUT							
NOx (as NO2)		(9)(10)	g/bhp-hr	0.50	0.50	0.50	0.50
CO		(9)(10)	g/bhp-hr	2.02	2.02	2.03	1.96
THC (mol. wt. of 15.84)		(9)(10)	g/bhp-hr	4.27	4.27	4.17	3.93
NMHC (mol. wt. of 15.84)		(9)(10)	g/bhp-hr	0.64	0.64	0.63	0.59
NMNEHC (VOCs) (mol. wt. of 15.84)		(9)(10)(11)	g/bhp-hr	0.43	0.43	0.42	0.39
HCHO (Formaldehyde)		(9)(10)	g/bhp-hr	0.42	0.42	0.40	0.39
CO2		(9)(10)	g/bhp-hr	456	456	476	515
EXHAUST OXYGEN		(9)(12)	% DRY	9.0	9.0	8.7	8.3
HEAT REJECTION							
HEAT REJ. TO JACKET WATER (JW)		(13)	Btu/min	37570	37570	32175	26761
HEAT REJ. TO ATMOSPHERE		(13)	Btu/min	5313	5313	4428	3543
HEAT REJ. TO LUBE OIL (OC)		(13)	Btu/min	4542	4542	3889	3235
HEAT REJ. TO A/C - STAGE 1 (1AC)		(13)(14)	Btu/min	12428	12428	9506	2742
HEAT REJ. TO A/C - STAGE 2 (2AC)		(13)(14)	Btu/min	5545	5545	4782	2920
COOLING SYSTEM SIZING CRITERIA							
TOTAL JACKET WATER CIRCUIT (JW+OC+1AC)		(14)(15)	Btu/min	59826			
TOTAL AFTERCOOLER CIRCUIT (2AC)		(14)(15)	Btu/min	5822			
A cooling system safety factor of 0% has been added to the cooling system sizing criteria.							

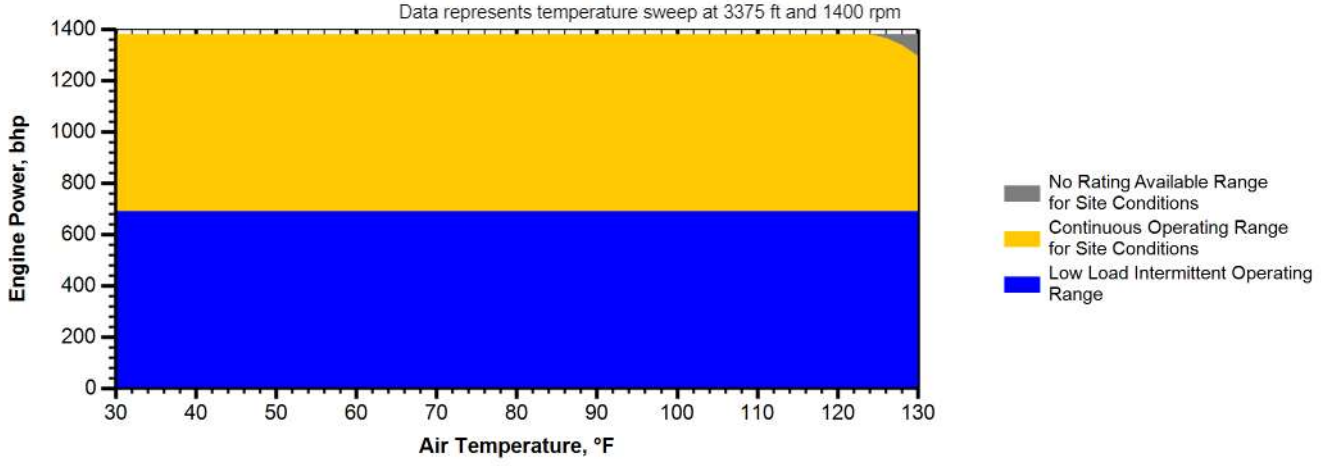
CONDITIONS AND DEFINITIONS

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

For notes information consult page three.

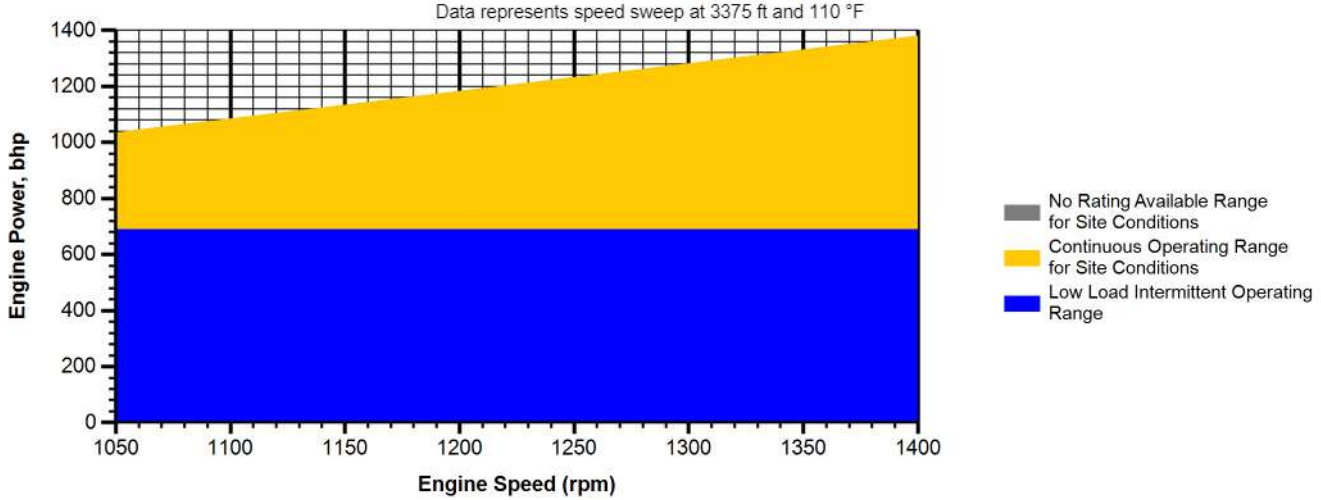
Engine Power vs. Inlet Air Temperature

Data represents temperature sweep at 3375 ft and 1400 rpm



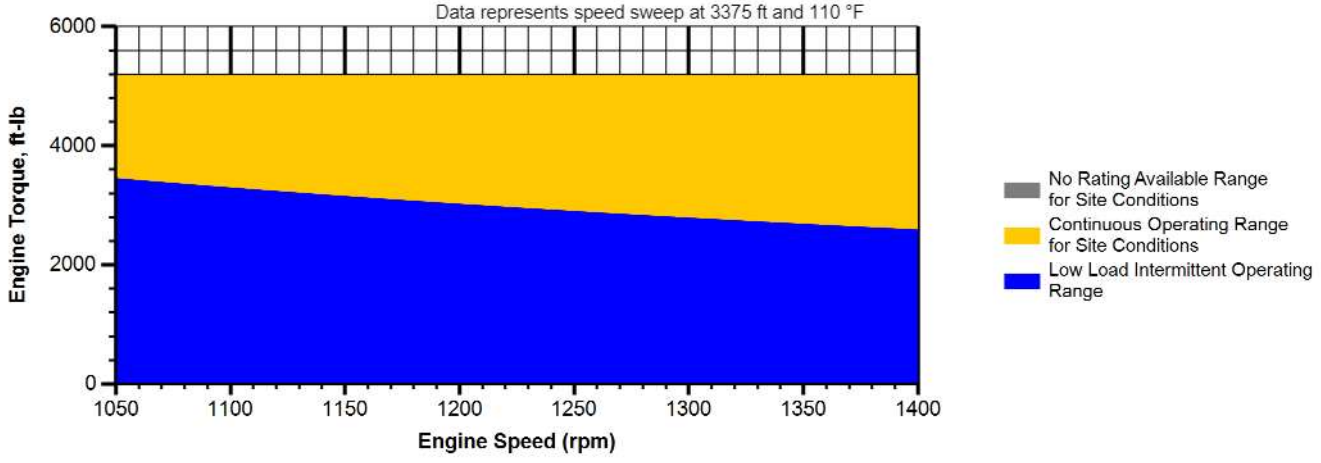
Engine Power vs. Engine Speed

Data represents speed sweep at 3375 ft and 110 °F



Engine Torque vs. Engine Speed

Data represents speed sweep at 3375 ft and 110 °F



Note:
At site conditions of 3375 ft and 110°F inlet air temp., constant torque can be maintained down to 1050 rpm. The minimum speed for loading at these conditions is 1050 rpm.

NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Constituent	Abbrev	Mole %	Norm
Water Vapor	H2O	0.0000	0.0000
Methane	CH4	94.7351	94.7350
Ethane	C2H6	2.3990	2.3990
Propane	C3H8	0.0568	0.0568
Isobutane	iso-C4H10	0.0005	0.0005
Norbutane	nor-C4H10	0.0006	0.0006
Isopentane	iso-C5H12	0.0000	0.0000
Norpentane	nor-C5H12	0.0000	0.0000
Hexane	C6H14	0.0000	0.0000
Heptane	C7H16	0.0000	0.0000
Nitrogen	N2	2.7394	2.7394
Carbon Dioxide	CO2	0.0687	0.0687
Hydrogen Sulfide	H2S	0.0000	0.0000
Carbon Monoxide	CO	0.0000	0.0000
Hydrogen	H2	0.0000	0.0000
Oxygen	O2	0.0000	0.0000
Helium	HE	0.0000	0.0000
Neopentane	neo-C5H12	0.0000	0.0000
Octane	C8H18	0.0000	0.0000
Nonane	C9H20	0.0000	0.0000
Ethylene	C2H4	0.0000	0.0000
Propylene	C3H6	0.0000	0.0000
TOTAL (Volume %)		100.0001	100.0000

Fuel Makeup:	Gas Analysis
Unit of Measure:	English

Calculated Fuel Properties

Caterpillar Methane Number:	92.8
Lower Heating Value (Btu/scf):	904
Higher Heating Value (Btu/scf):	1003
WOBBE Index (Btu/scf):	1189
THC: Free Inert Ratio:	34.61
Total % Inerts (% N2, CO2, He):	2.81%
RPC (%) (To 905 Btu/scf Fuel):	100%
Compressibility Factor:	0.998
Stoich A/F Ratio (Vol/Vol):	9.44
Stoich A/F Ratio (Mass/Mass):	16.33
Specific Gravity (Relative to Air):	0.578
Fuel Specific Heat Ratio (K):	1.314

CONDITIONS AND DEFINITIONS

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

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

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

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

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

FUEL LIQUIDS

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

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

Catalyst Element (Table 1A)		
Application	Gas Compression	
Engine Model	CAT G3516J	
Engine Mechanical Power	1380 hp	
Fuel	Natural Gas (PQNG)	
Exhaust Flowrate	14283 lb/hr	
Exhaust Temperature	813 deg. F	
Silencer Model	ARC3W6-16HGS	
Catalyst Model	DC3W	
Catalyst Part Number	C30F1-01-040A-03W3-01	
Number of Elements	4	
Catalyst Code	0A / 300 cpsi	
Pre-Catalyst Emissions g/bhp-h	NOx	0.50
	CO	2.02
	NMNEHC	0.43
	CH2O	0.42
Post-Catalyst g/bhp-h	NOx	0.50
	CO	0.25
	NMNEHC (VOC)	0.25
	CH2O	0.06
Limited Warranty	(doc. X0000-0000-K1) 1 year or 8000 hours operation, whichever first	

Turbine Specifications – Solar T60

4.1 GUARANTEED PERFORMANCE

4.1.1 GAS TURBINE PERFORMANCE DATA

Performance Conditions (See Note a)		
Elevation	3,045	feet
Design Ambient Temperature	59	Fahrenheit
Design Relative Humidity		%
Inlet Pressure Drop	6.0	in W.C.
Exhaust Pressure Drop	4.0	in W.C.
Turbine Operating Level	100%; Continuous Duty	
Power Output and Heat Rate (See Note b)		
Gas Fuel		
Output Power	4,750	kW
Heat Rate	11,383	Btu/kW-hr (LHV)

Notes:

(a) Generator set performance is guaranteed on the basis of the pressure drops indicated for the inlet and exhaust systems. These are assumed values. Losses through the Turbine Air Inlet System are based on the configuration described and a clean filter. Deviations from these values will have a corresponding impact on performance observed at the project site. Intake air quality, gas fuel, and liquid fuel shall meet ES 9-98. Natural Gas fuel sulfur content shall be no greater than 0.1%.

(b) Output Power and Heat Rate is guaranteed on the basis of the referenced Performance Conditions listed above, by the Fuel Component Analysis section of this proposal (as applicable), and on the basis of the equipment being in new and clean condition as defined in this proposal;
Guarantee Performance is demonstrated based on a standard San Diego factory test, corrected to:
> 0 feet above sea level
> 60% Relative Humidity
> 0 inlet duct loss; 0 exhaust duct loss
> 59º F, 80º F, or 100º F, depending on the local ambient temperature when the test is conducted
Electric Output Power (and power used to determine Heat Rate) is referenced to the generator terminals, and is based on the generator operating at unity Power Factor (PF = 1.0). For multiple unit applications, it will be based on the average over the total number of units, not on an individual basis;

(c) Exhaust Energy is not guaranteed. Instead, "Expected Values" are provided in the following section entitled, "Expected Generator Set Performance".

4.1.2 EMISSIONS OUTPUT (GAS FUEL)

The following turbine output emissions are warranted by Solar Turbines subject to the conditions indicated below, and through the warranty period indicated in Commercial Highlights.

Gas Fuel Operation (per the Gas Fuel Component Analysis):

NOx	15 ppmvd
CO	25 ppmvd
UHC	25 ppmvd

Operating Conditions for the above emissions are as follows:

Ambient Temperature range: -4 to 120°F (-20 to 49°C)

Operating Range: 50-100%

(Must meet or exceed ES9-98 for air, fuel, and water quality. Emissions corrected to 15% O_2 dry basis, steady-state operation.)

Notes/Clarifications:

The emissions cited above are applicable only for steady-state conditions and does not apply during start-up, shutdown, malfunction, or during transient events.

Any gas turbine fuels that do not meet or exceed Solar Specification ES 9-98 will impact emissions performance. As the SMT unit is moved from site to site, deviations from approved fuels will adversely affect emission performance and may impact any emissions warranty and/or performance guarantee. Site specific fuel samples require review by Solar Engineering.

Due to the mobility of the SMT product, the unit is not equipped with an exhaust stack therefore Solar cannot demonstrate / test / verify emissions at site or during package test. Factory testing is with Natural Gas and Emissions testing is available during the gas turbine engine acceptance test.

4.2 EXPECTED PERFORMANCE

4.2.1 GAS TURBINE PERFORMANCE DATA

The following gas turbine package performance is expected, but not guaranteed. The "Run" numbers correspond to different operating points and/or ambient conditions.

Customer	Model: **TAURUS 60-7901S**
Job ID	Package Type: **GSC**
Run By: **Hobbs Mattison G** / Date Run: **5-Nov-24**	Match: **STANDARD**
Engine Performance Code: **REV. 4.20.2.28.14** / Engine Performance Data: **REV. 2.1**	Fuel System: **GAS**
	Fuel Type: **SD NATURAL GAS**

DATA FOR NOMINAL PERFORMANCE

Elevation	**feet**	**3045**
Inlet Loss	**in H2O**	**6.0**
Exhaust Loss	**in H2O**	**4.0**

		1	2	3	4	5
Engine Inlet Temperature	**deg F**	**0**	**32.0**	**59.0**	**85.0**	**104.0**
Relative Humidity	**%**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**
Gearbox Efficiency		**0.9820**	**0.9820**	**0.9820**	**0.9820**	**0.9820**
Generator Efficiency		**0.9740**	**0.9740**	**0.9740**	**0.9740**	**0.9740**
Based On 1.0 Power Factor						
Specified Load*	**kW**	**FULL**	**FULL**	**FULL**	**FULL**	**FULL**
Net Output Power*	**kW**	**5837**	**5331**	**4897**	**4369**	**3981**
Fuel Flow	**mmBtu/hr**	**62.00**	**57.66**	**54.07**	**50.22**	**47.64**
Heat Rate*	**Btu/kW-hr**	**10621**	**10817**	**11041**	**11495**	**11966**
Therm Eff*	**%**	**32.126**	**31.544**	**30.903**	**29.683**	**28.515**
Engine Exhaust Flow	**lbm/hr**	**165960**	**158956**	**151974**	**142684**	**135483**
PT Exit Temperature	**deg F**	**931**	**945**	**959**	**981**	**1002**
Exhaust Temperature	**deg F**	**931**	**945**	**959**	**981**	**1002**

Fuel Gas Composition (Volume Percent)

Methane (CH4)	**92.79**
Ethane (C2H6)	**4.16**
Propane (C3H8)	**0.84**
N-Butane (C4H10)	**0.18**
N-Pentane (C5H12)	**0.04**
Hexane (C6H14)	**0.04**
Carbon Dioxide (CO2)	**0.44**
Hydrogen Sulfide (H2S)	**0.0001**
Nitrogen (N2)	**1.51**

Fuel Gas Properties					
LHV (Btu/Scf)	**939.2**	**Specific Gravity**	**0.5970**	**Wobbe Index at 60F**	**1215.6**

**Electric power measured at the generator terminals.*

This performance was calculated with a basic inlet and exhaust system. Special equipment such as low noise silencers, special filters, heat recovery systems or cooling devices will affect engine performance. Performance shown is "Expected" performance at the pressure drops stated, not guaranteed.

Fuel Gas Analysis

Certificate of Analysis

Number: 6030-24090932-001A

Artesia Laboratory
200 E Main St.
Artesia, NM 88210
Phone 575-746-3481

Brenda McGough
Northwind Midstream Partners
825 Town & Country Lane
Houston, TX 77380

Oct. 01, 2024

Station Name:	Titan Fuel Gas	Sampled By:	Landon Buck
Station Number:	1000-11525	Sample Of:	Gas Spot
Station Location:	Northwind Midstream	Sample Date:	09/24/2024 11:00
Sample Point:	Meter Run	Sample Conditions:	1000 psig, @ 78.9 °F
Instrument:	70142339 (Inficon GC-MicroFusion)	Effective Date:	09/24/2024 11:00
Last Inst. Cal.:	09/23/2024 0:00 AM	Method:	GPA-2261M
Analyzed:	09/27/2024 08:44:34 by CDW	Cylinder No:	1111-007909

Analytical Data

Components	Un-normalized Mol %	Mol. %	Wt. %	GPM at 14.73 psia		
Hydrogen Sulfide	0.0000	0.0000	0.0000		GPM TOTAL C2+	0.642
Nitrogen	1.8723	1.8961	3.1616		GPM TOTAL C3+	0.156
Methane	94.6304	95.8319	91.5098		GPM TOTAL iC5+	0.132
Carbon Dioxide	0.0663	0.0671	0.1758			
Ethane	1.7907	1.8134	3.2456	0.486		
Propane	0.0673	0.0682	0.1790	0.019		
Iso-butane	0.0040	0.0041	0.0142	0.001		
n-Butane	0.0139	0.0141	0.0488	0.004		
Iso-pentane	0.0085	0.0086	0.0369	0.003		
n-Pentane	0.0129	0.0131	0.0563	0.005		
Hexanes Plus	0.2798	0.2834	1.5720	0.124		
	98.7461	100.0000	100.0000	0.642		

Calculated Physical Properties	**Total**	**C6+**
Relative Density Real Gas	0.5811	3.2176
Calculated Molecular Weight	16.80	93.19
Compressibility Factor	0.9979	
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.73 psia & 60°F		
Real Gas Dry BTU	1022.2	5141.1
Water Sat. Gas Base BTU	1004.8	5051.6
Ideal, Gross HV - Dry at 14.73 psia	1020.1	5141.1
Ideal, Gross HV - Wet	1002.3	5051.6

Comments: H2S Field Content 0 ppm

Mostafa Ahmadi

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

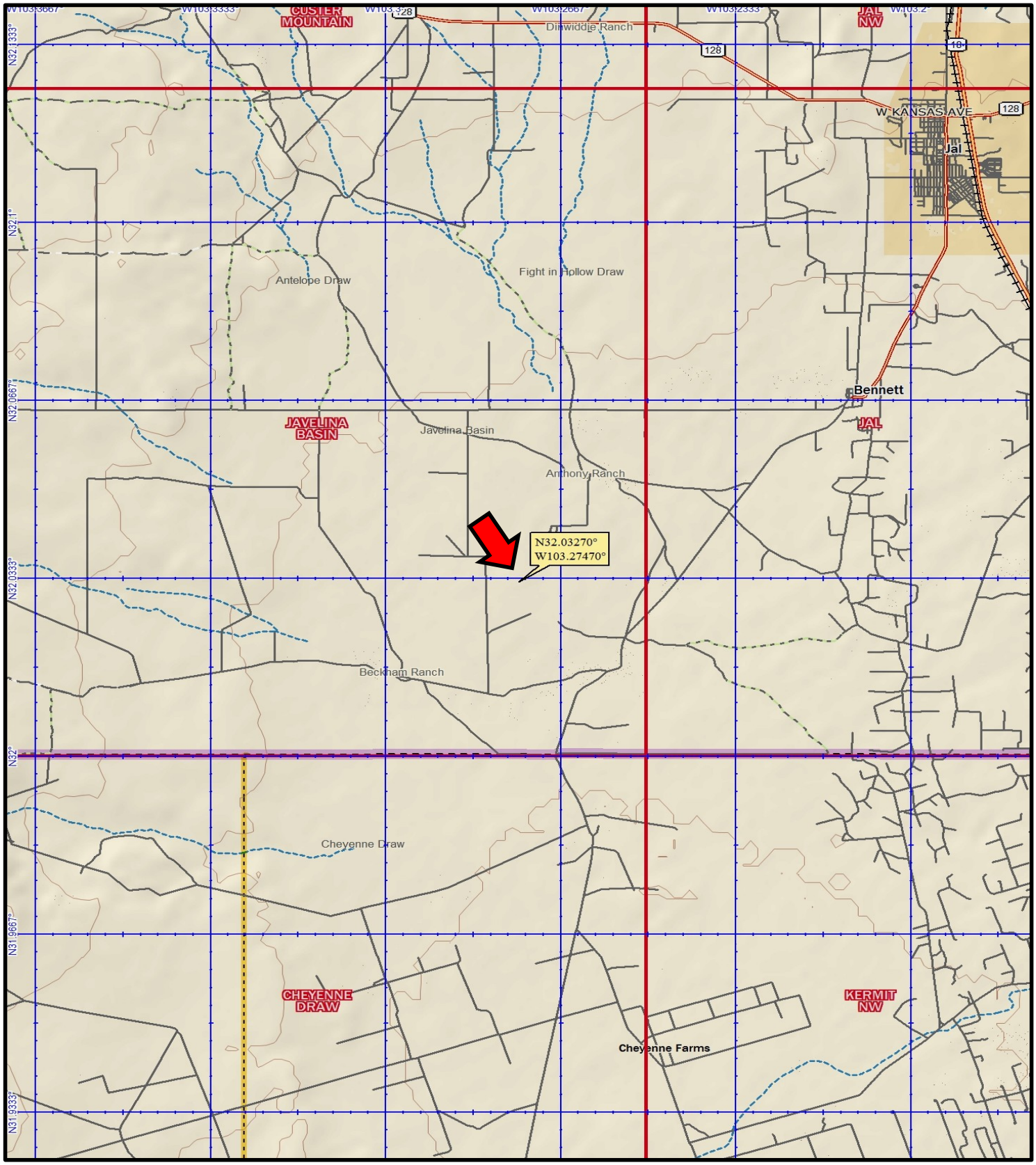
Section 8

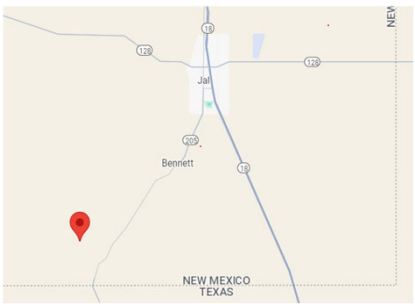
Map(s)

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 is attached on the following page.





PROJECT	19901-03		
PREPARED FOR	Northwind Midstream Partners LLC		
LOCATION	Lea County, New Mexico		
SHEET *1 of 1*	***DRAWN BY*** *TH*	***REVIEWED BY*** *ET*	***DATE*** *03/03/25*

PEI

AREA MAP
Titan Treater Plant #2

Section 9

Proof of Public Notice

(for NSR applications submitting under 20.2.72 or 20.2.74 NMAC)

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

☑ **I have read the AQB "Guidelines for Public Notification for Air Quality Permit Applications"**
This document provides detailed instructions about public notice requirements for various permitting actions. It also provides public notice examples and certification forms. Material mistakes in the public notice will require a re-notice before issuance of the permit.

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

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

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

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

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

Category	Notified Party
Citizens	NGL South Ranch Inc.
Other Landowners	
Counties	Lea
Municipalities	Jal
Indian Tribes	None

Location of Postings
Plant Entrance
US Post Office; Jal
Coles Diner; Jal
Lowe's Grocery Store; Jal

9589 0710 5270 1958 8246 15

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
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For delivery information, visit our website at *www.usps.com®*.

Lovington, NM 88260

OFFICIAL USE

Certified Mail Fee	$4.85
Extra Services & Fees (check box, add fee as appropriate)	
☐ Return Receipt (hardcopy)	$0.00
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$0.73
Total Postage and Fees	$5.58

0062 02

PARK HILL STATION DENVER, CO
Postmark Here
FEB 24 2025
02/24/2025

Sent To: LEA COUNTY MANAGER
Street and Apt. No., or PO Box No.: 100 N. MAIN AVE. STE 4
City, State, ZIP+4®: LOVINGTON, NM, 88260

PS Form 3800, January 2023 PSN 7530-02-000-9047 See Reverse for Instructions

9589 0710 5270 1958 8245 92

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at *www.usps.com®*.

Rockwall, TX 75087

OFFICIAL USE

Certified Mail Fee	$4.85
Extra Services & Fees (check box, add fee as appropriate)	
☐ Return Receipt (hardcopy)	$0.00
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$0.73
Total Postage and Fees	$5.58

0062 02

PARK HILL STATION DENVER, CO
Postmark Here
FEB 24 2025
02/24/2025

Sent To: NGL SOUTH RANCH INC.
Street and Apt. No., or PO Box No.: 2424 RIDGE RD.
City, State, ZIP+4®: ROCKWELL, TX 75087

PS Form 3800, January 2023 PSN 7530-02-000-9047 See Reverse for Instructions

9589 0710 5270 1958 8246 22

U.S. Postal Service™
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Domestic Mail Only

For delivery information, visit our website at *www.usps.com®*.

Jal, NM 88252

OFFICIAL USE

Certified Mail Fee	$4.85
Extra Services & Fees (check box, add fee as appropriate)	
☐ Return Receipt (hardcopy)	$0.00
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$0.73
Total Postage and Fees	$5.58

0062 02

PARK HILL STATION DENVER, CO
Postmark Here
FEB 24 2025
02/24/2025

Sent To: JAL CITY MANAGER
Street and Apt. No., or PO Box No.: 710 WYOMING AVE.
City, State, ZIP+4®: JAL, NM, 88252

PS Form 3800, January 2023 PSN 7530-02-000-9047 See Reverse for Instructions

Lea County GIS Parcel Report

Area of Interest (AOI) Information

Area : 501.9 acres

Feb 24 2025 10:13:09 Central Standard Time

Lea County Boundary

Sections

Lea County Roads

1:18,056

0 0.13 0.25 0.5 mi

0 0.2 0.4 0.8 km

Maxar

Assessment Information

#	Owner Number	Parcel Number	UPC Code	Owner Name	Mailing Address
1	51649	4000516490011	51649	NGL SOUTH RANCH INC	2424 RIDGE RD ROCKWELL, TX 75087-5116
2	216634	4000516490005	216634	NORTHWIND MIDSTREAM PARTNERS LLC	825 TOWN AND COUNTRY LN STE 700 HOUSTON, TX 77024-2326
3	*No Data*	*No Data*	STATE - Beckham Ranch Inc	*No Data*	Empty Mailing Address
4	*No Data*	*No Data*	STATE - Dinwiddie Cattle Co	*No Data*	Empty Mailing Address
5	51649	4930721083029	51649	NGL SOUTH RANCH INC	2424 RIDGE RD ROCKWELL, TX 75087-5116

#	Property Address	Subdivision Name	Legal Information	Unit	Block	Lot	Area(acres)
1		*No Data*	*No Data*	*No Data*	*No Data*	*No Data*	18.10
2		*No Data*	*No Data*	*No Data*	*No Data*	*No Data*	61.21
3		*No Data*	*No Data*	*No Data*	*No Data*	*No Data*	92.11
4		*No Data*	*No Data*	*No Data*	*No Data*	*No Data*	92.42
5		*No Data*	*No Data*	*No Data*	*No Data*	*No Data*	238.06

Other Information

#	Taxable Value	Exempt Value	Net Value	Livestock Value	Manufactured Home Value
1	235,252	0	235,252	0	0
2	*No Data*	*No Data*	*No Data*	*No Data*	*No Data*
3	5,730	0	5,730	0	0

#	Personal Property Value	Land Value	Improvement Value	Full Value	Deed Book
1	0	705,756	0	705,756	2211
2	*No Data*	*No Data*	*No Data*	*No Data*	*No Data*
3	0	17,190	0	17,190	*No Data*

#	Deed Page	District	Section	Township	Range
1	830	190	*No Data*	26	36
2	*No Data*	*No Data*	*No Data*	26	36
3	0	190	*No Data*	26	36

#	Date Filed	Most Current Tax	Year Recorded	Area(acres)
1	0	5,193.00	2023	61.21
2	*No Data*	*No Data*	*No Data*	184.52
3	0	123.00	*No Data*	256.16

Building Information

#	Year Built	Number of Stories	First Floor SQFT	Second Floor SQFT	Basement SQFT	Area(acres)
1	*No Data*	*No Data*	*No Data*	*No Data*	*No Data*	501.90

February 24, 2025 Certified Mail No. 9589 0710 5270 1958 8246 22

Jal City Manager
710 Wyoming Ave.
Jal, New Mexico 88252

Re: Public Notice for NSR Permit Application
Titan Treater Plant #2

Dear City Manager:

In accordance with the application requirements of 20.2.72 NMAC, Northwind Midstream Partners, LLC is providing notification of the planned construction of Titan Treater Plant #2 in Lea County, NM. The site is located within 10 miles of Jal. A public notice will be published in the Hobbs News Sun newspaper, then placed at the proposed site location and three other locations in the surrounding area. A copy of the notice is attached. Should you have any questions, please contact me at (346) 613-1471 or by email at jyamartino@nwmidstream.com.

Sincerely,

Jillian Yamartino
Air-Environmental Manager

Attachment: Public Notice

February 24, 2025 Certified Mail No. 9589 0710 5270 1958 8246 15

Lea County Manager
100 N. Main Avenue
Suite 4
Lovington, New Mexico 88260

Re: Public Notice for NSR Permit Application
Titan Treater Plant #2

Dear Manager:

In accordance with the application requirements of 20.2.72 NMAC, Northwind Midstream Partners, LLC is providing notification of the planned construction of Titan Treater Plant #2 in Lea County, NM. The site is located on private property. A public notice will be published in the Hobbs News Sun newspaper, then placed at the proposed site location and three other locations in the surrounding area. A copy of the notice is attached. Should you have any questions, please contact me at (346) 613-1471 or by email at jyamartino@nwmidstream.com.

Sincerely,

Jillian Yamartino
Air-Environmental Manager

Attachment: Public Notice

February 24, 2025 Certified Mail No. 9589 0710 5270 1958 8245 92

NGL South Ranch Inc.
2424 Ridge Road
Rockwell, TX 75087

Re: Public Notice for NSR Permit Application
Titan Treater Plant #2

To Whom It May Concern:

In accordance with the application requirements of 20.2.72 NMAC, Northwind Midstream Partners, LLC is providing notification of the planned construction of Titan Treater Plant #2 in Lea County, NM. The site is located within one-half mile of your property. A public notice will be published in the Hobbs News Sun newspaper, then placed at the proposed site location and three other locations in the surrounding area. A copy of the notice is attached. Should you have any questions, please contact me at (346) 613-1471 or by email at jyamartino@nwmidstream.com.

Sincerely,

Jillian Yamartino
Air-Environmental Manager

Attachment: Public Notice

NOTICE OF AIR QUALITY PERMIT APPLICATION

Northwind Midstream Partners, LLC announces its application to the New Mexico Environment Department for an air quality permit to construct a natural gas treating facility. The expected date of application submittal to the Air Quality Bureau is February 28, 2025. The exact location for the facility known as Titan Treater Plant #2 is at latitude 32.0327 dec deg North and longitude -103.2747 dec deg West. The approximate location of this facility is 7.6 miles SW of Jal in Lea County. 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.

The total inlet capacity of the facility will be approximately 220 million standard cubic feet per day.

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

Pollutant:	Pounds per hour	Tons per year
Particulate Matter (PM)	17	51
PM_{10}	16	47
$PM_{2.5}$	16	46
Sulfur Dioxide (SO_2)	3573	219
Nitrogen Oxides (NO_x)	145	204
Carbon Monoxide (CO)	444	211
Volatile Organic Compounds (VOC)	2051	238
Total sum of all Hazardous Air Pollutants (HAPs)	34	24.8
Green House Gas Emissions as Total CO_2e	n/a	250,000

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

The owner and/or operator of the Facility is: **Northwind Midstream Partners, LLC; 811 Louisiana St., Suite 2500; Houston, TX 77002**

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

Please refer to the company name and site name, or send a copy of this notice along with your comments, since the Department may have not yet received the permit application. Please include a legible return mailing address with your comments. Once the Department has performed a preliminary review of the application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location.

General information about air quality and the permitting process, and links to the regulations can be found at the Air Quality Bureau's website: www.env.nm.gov/air-quality/permitting-section-home-page/. The regulation dealing with public participation in the permit review process is 20.2.72.206 NMAC.

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

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

General Posting of Notices – Certification

I, Josh Barker, the undersigned, certify that on February 24th, 2025, posted a true and correct copy of the attached Public Notice in the following publicly accessible and conspicuous places in the Jal of Lea County, State of New Mexico on the following dates:

1. Titan Plant Sign
2. US Post Office; Jal, NM
3. Coles Diner; Jal, NM
4. Lowe's Grocery Store; Jal, NM

Signed this 24 day of February, 2025,

Signature

2.24.25
Date

Josh Barker
Printed Name

HSE Field Supervisor
Title {APPLICANT OR RELATIONSHIP TO APPLICANT}

From: Jillian Yamartino
To: dawn@noalmark.com
Subject: Public Service Announcement - Northwind Midstream Partners, LLC - Titan Treater Plant #2
Date: Wednesday, February 26, 2025 3:47:00 PM
Attachments: image001.png

In accordance with New Mexico Administrative Code 20.2.72.203.B, we request the following public service announcement (PSA) be aired for the Titan Treater Plant #2.

Northwind Midstream Partners, LLC announces its application to modify Titan Treater Plant #2, a sour gas treating facility located at latitude 32.0327 and longitude -103.2747 near Jal, New Mexico The proposed application consists of the construction of a treating plant, Titan Treater Plant #2. The expected date of application submittal to the Air Quality Bureau is February 28, 2025. Notices have been posted in the Hobbs News Sun, at the Titan Treater Plant entrance, at the US Postal Service office in Jal, at Coles Diner in Jal, and at Lowe's Grocery Store in Jal. If you have any comments about the construction or operation of the above facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to the address below:

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

Jillian Yamartino
Environmental-Air Manager
jyamartino@nwmidstream.com
Cell: 207-745-0783

NORTHWIND MIDSTREAM

Affidav

STATE OF N
COUNTY OF

I, Daniel Rus
News-Sun, a
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Publisher

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25th day of

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January 2
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NOTICE OF AIR QUALITY PERMIT APPLICATION

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The total inlet capacity of the facility will be approximately 220 million standard cubic feet per day.

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

Pollutant:	Pounds per hour	Tons per year
Particulate Matter (PM)	17	51
PM_{10}	16	47
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Sulfur Dioxide (SO_2)	3573	219
Nitrogen Oxides (NO_x)	145	204
Carbon Monoxide (CO)	444	211
Volatile Organic Compounds (VOC)	2051	238
Total sum of all Hazardous Air Pollutants (HAPs)	34	24.8
Green House Gas Emissions as Total CO_2e	n/a	250,000

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

The owner and/or operator of the Facility is: **Northwind Midstream Partners, LLC; 811 Louisiana St., Suite 2500; Houston, TX 77002**

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.

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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.

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07110905

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.

EVAN TULLOS
PEI
5 CARDINAL COURT
EDWARDSVILLE, IL 62025

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
February 25, 2025
and ending with the issue dated
February 25, 2025.

Publisher

Sworn and subscribed to before me this 25th day of February 2025.

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.

ark Tank	Shark Tank (N)	S
30) NBA Basketball Cleveland Cavaliers at Orlando Magic From Kia enter in Orlando, Fla. (N) (Live)		N
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DANIELS INSURANC INC.

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Spotted e today!

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IT APPLICATION

AD Environment Department for an air quality permit to al to the Air Quality Bureau is February 28, 2025. The 7 dec deg North and longitude -103.2747 dec deg West. Jal, NM head south on NM-205 S for 6.8 miles. Turn llow for 1 mile, bearing right at the fork to facility.

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llows in pound per hour (pph) and tons per year (tpy). ent's review:

our	Tons per year
	51
	47
	46
	219
	204
	211
	238
	24.8
	250,000

day, 7 days per week, and 52 weeks per year.

311 Louisiana St., Suite 2500; Houston, TX 77002

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regulations can be found at the Air Quality Bureau's tion dealing with public participation in the permit

ente de Nuevo México, acerca de las emisiones añol, por favor comuníquese con esa oficina al

e or sex in the administration of its programs or ordination of compliance efforts and receipt of t 7, including Title VI of the Civil Rights Act of 1964, ct of 1975, Title IX of the Education Amendments of 72. If you have any questions about this notice or e that you have been discriminated against with nator, NMED, 1190 St. Francis Dr., Suite N4050, P.O. ay also visit our website at ow and where to file a complaint of discrimination.

07110905

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5 CARDINAL COURT
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LEGAL LEGAL LEGAL LEGAL

LEGAL NOTICE
February 25, 2025

NOTICE OF AIR QUALITY PERMIT APPLICATION

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EVAN TULLOS
PEI
5 CARDINAL COURT
EDWARDSVILLE, IL 62025

Section 10

Written Description of the Routine Operations of the Facility

---

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:

Titan Treater Plant #2 is a 220 million standard cubic feet per day (MMscfd) sour gas treating facility designed to handle high-pressure field gas. The facility compresses inlet gas using natural gas-fired engines (CE-1 through CE-7). Post-compression, the inlet gas undergoes amine treatment (AM-1 and AM-2) to remove acid gases such as H2S and CO2. Hot oil heaters (HOH-1 and HOH-2) provide heat for the amine treatment system. The resulting acid gas stream is directed to five (5) electric-driven compressors (AGI-COMP1 through AGI-COMP5), one (1) of which will be a spare unit, which inject the acid gas underground via AGI wells. The sweetened gas is first sent through a triazine contact tower to remove any residual sulfur compounds. Gas is then dehydrated using triethylene glycol units (DHY-1 and DHY-2) and compressed using natural gas-fired compressors (CE-8 through CE-12) for sales.

Condensate separated in the inlet slug catcher undergoes further processing in the stabilization train. Stabilizer overhead gas is recycled into the plant inlet via three (3) electric-driven compressors (SOH-COMP1 through SOH-COMP3), while the stabilized condensate is stored in four (4) 1000-barrel tanks (TK-3, TK-4, TK-5, and TK-6) before being pumped offsite. In case of pipeline unavailability, condensate is loaded out via truck (LOAD-2). Additionally, liquids collected via the closed drain system are directed to two (2) 400-barrel slop water tanks (TK-1 and TK-2) and hauled offsite via truck (LOAD-1). Emissions from LOAD-2 are routed to the tank header via a vapor return line. A redundant VRU system (VRU) controls emissions from the condensate and slop water tanks and truck loading, routing vapors back to the inlet. Sweep gas is introduced to the flare header for FL-1 and AGFL-1 to prevent oxygen ingress into the system.

Section 11

Source Determination

Source submitting under 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC

Sources applying for a construction permit, PSD permit, or operating permit shall evaluate surrounding and/or associated sources (including those sources directly connected to this source for business reasons) and complete this section. Responses to the following questions shall be consistent with the Air Quality Bureau's permitting guidance, Single Source Determination Guidance, which may be found on the Applications Page in the Permitting Section of the Air Quality Bureau website.

Typically, buildings, structures, installations, or facilities that have the same SIC code, that are under common ownership or control, and that are contiguous or adjacent constitute a single stationary source for 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC applicability purposes. Submission of your analysis of these factors in support of the responses below is optional, unless requested by NMED.

A. Identify the emission sources evaluated in this section (list and describe)**:**
All sources in Table 2-A are included in this evaluation.

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.**

B. **This facility is not one of the listed 20.2.74.501 Table I – PSD Source Categories. The "project" emissions** for this modification are **not significant. The increase in emissions from each criteria pollutant is less than 250 TPY. The "project" emissions listed below do only result from changes described in this permit application. Also, specifically discuss whether this project results in "de-bottlenecking", or other associated emissions resulting in higher emissions. The project emissions (before netting) for this project are as follows [see Table 2 in 20.2.74.502 NMAC for a complete list of significance levels]:**

a. **NOx: 201.5 TPY**
b. **CO: 209.0 TPY**
c. **VOC: 235.0 TPY**
d. **SOx: 216.4 TPY**
e. **PM: 26.7 TPY**
f. **PM10: 26.7 TPY**
g. **PM2.5: 25.6 TPY**
h. **Fluorides: — TPY**
i. **Lead: — TPY**
j. **Sulfur compounds (listed in Table 2): — TPY**
k. **GHG: 241,617 TPY**

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/

To save paper and to standardize the application format, delete this sentence, and begin your submittal for this attachment on this page.

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	No	N/A	This facility does not operate 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	No	N/A	The facility does not meet the definition of gas processing plant and does not operate a sulfur recovery unit.
20.2.38 NMAC	Hydrocarbon Storage Facility	No	TK-3 to TK-6	The facility will operate storage tanks greater than 20,000 gallons that process more than 30,000 gallons per week. Redundant VRUs are used to control emissions for TK-3 to TK-6.
20.2.39 NMAC	Sulfur Recovery Plant - Sulfur	No	N/A	This facility is not a sulfur recovery plant; therefore, this regulation does not apply.
20.2.50 NMAC	Oil and Gas Sector – Ozone Precursor Pollutants	Yes	CE-1 to CE-12, TURB-1 to TUBR-6, DHY-1 to DHY-2, HOH-1 to HOH-2, TK-1 to TK-2	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 113 – CE-1-CE-12 are spark ignition engines that will be subject to this regulation. TURB-1 – TURB-6 are turbines that will be subject to this regulation. 114 - Northwind Midstream Partners, LLC will comply with the applicable requirements of this subpart. 115 – Closed vent systems used to comply with this regulation will meet the applicable requirements.

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.)
				116 - Northwind Midstream Partners, LLC will comply with the applicable requirements of this subpart. 118 - DHY-1-DHY-2 each have a PTE > 2 tpy of VOC; therefore, these units will be subject to this subpart. 119 – HOH-1 to HOH-2 have heat inputs greater than 20 MMBtu/hr and are therefore subject to this subpart. 120 – Liquids will be loaded primarily by pipeline; however, truck loading would occur in the event of downtime. Truck vapor is routed back to the tank for control. 121 – Each Pig Launching and receiver have a PTE <1 TPY, therefore, this subpart does not apply. 122 – Pneumatic controllers and pumps are non-emitting and operated via instrument air, therefore, this subpart does not apply. 123 - The TK-1 & TK-2 have a PTE greater than 2 tpy; therefore, this subpart does apply. 117 and 124-127 - Are not applicable to the operations at this facility.
20.2.61.109 NMAC	Smoke & Visible Emissions	Yes	CE-1 to CE-12, HOH-1 to HOH-2, DHR-1 to DHR-2, STABHR-1, AGFL-1, FL-1, TURB-1 to TURB-6	Stationary Combustion Equipment, such as engines, boilers, heaters, and flares are subject to this regulation.
20.2.70 NMAC	Operating Permits	Yes	Facility	The facility will be subject to 20.2.70 NMAC.
20.2.71 NMAC	Operating Permit Fees	No	Facility	The facility will be subject to 20.2.71 NMAC.
20.2.72 NMAC	Construction Permits	Yes	Facility	This facility is subject to 20.2.72 NMAC.
20.2.73 NMAC	NOI & Emissions Inventory Requirements	Yes	Facility	The facility is subject to 20.2.73 NMAC.
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	CE-1 to CE-12, TURB-1 to TURB-6, FUG-1, HOH-1 to HOH-2, AGI-COMP1 to AGI-COMP5, SOH-COMP1 to SOH-COMP3,	See applicable NSPS discussions below.

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.)
			STABHR-1	
20.2.78 NMAC	Emission Standards for HAPS	No	N/A	This facility emits hazardous air pollutants which are subject to the requirements of 40 CFR Part 63; however, there are no units subject to 40 CFR Part 61.
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	See applicable NESHAP discussions below.

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	CE-1 to CE-12, TURB-1 to TURB-6, FUG-1, HOH-1 to HOH-2, AGI-COMP1 to AGI-COMP5, SOH-COMP1 to SOH-COMP3, STABHR-1	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 electric utility steam generating units at this facility.
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	Small Industrial-Commercial-Institutional Steam Generating Units	Yes	HOH-1, HOH-2 & STABHR-1	HOH-1, HOH-2 and STABHR-1 meet the definition of steam generating units as each device combusts fuel and heats heat transfer medium and are greater than 10 MMbtu/hr.

Federal Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification:
NSPS 40 CFR 60, Subpart Ka	**Storage Vessels for Petroleum Liquids** After May 18, 1978, and **Prior** to July 23, 1984	No	N/A	Not applicable since the tanks were constructed after July 23, 1984.
NSPS 40 CFR 60, Subpart Kb	Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) After July 23, 1984	No	N/A	Not applicable since the tanks were constructed after October 4, 2023.
NSPS 40 CFR 60.330 Subpart GG	Stationary Gas Turbines	No	N/A	Not applicable as the turbines were constructed after the applicability date of NSPS KKKK.
NSPS 40 CFR 60, Subpart KKKK	Stationary Gas Turbines	No	TURB-1 to TURB-6	TURB-1 to TURB-6 will be subject to this regulation since they will be constructed after February 18, 2005 and are greater than 10 MMBtu/hr.
NSPS 40 CFR Part 60 Subpart KKK	Leaks of VOC from Onshore Gas Plants	No	N/A	The facility was constructed after 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 August 23, 2011.
NSPS 40 CFR Part 60 Subpart OOOO	O&G after August 23, 2011 and before September 18, 2015	No	N/A	This regulation is applicable to affected facilities 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	O&G After September 18, 2015	Yes	N/A	This regulation is applicable to affected facilities after September 18, 2015and on or before December 6, 2022. The facility is not subject to this regulation.
NSPS 40 CFR Part 60 Subpart OOOOb	O&G After December 6, 2022	Yes	CE-1 to CE-12, FUG-1, AGI-COMP1 to AGI-COMP5, SOH-COMP1 to SOH-COMP3	The reciprocating compressors associated with are likely subject pursuant to 60.5365b(c). A formal determination of applicability will be made upon delivery of compressors. FUG-1 is subject per 60.5365a(i). AM-1 and AM-2 are exempt per §60.5365b(g)(4). TK-1 through TK-6 are not affected facilities since post-VRU emissions are less than applicable thresholds in 60.5365b(e)(1)(i) and (ii). The tanks will comply with the closed vent system requirements.
NSPS 40 CFR Part 60 Subpart OOOOc	Greenhouse Gas Emissions from Existing Crude Oil and Natural Gas Facilities	Yes	N/A	It is expected all affected sources will be subject to OOOOb.
NSPS 40 CFR 60 Subpart IIII	Standards of performance for Stationary Compression Ignition ICE	No	N/A	The engines located at this facility are SI engines; therefore, this subpart does not apply.
NSPS	Standards of Performance for	Yes	CE-1 to CE-12	According to the 40 CFR §60.4230 (a)(4), spark ignition reciprocating internal combustion engines commencing construction, modification, or

Federal Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification:
40 CFR Part 60 Subpart JJJJ	Stationary Spark Ignition Internal Combustion Engines			reconstruction after June 12, 2006 and engines with a maximum engine power greater than or equal to 500 hp manufactured after July 1, 2007 are subject to these standards.
NSPS 40 CFR 60 Subpart TTTT	Greenhouse Gas Emissions for Electric Generating Units	No	N/A	This facility does not have any electric generating units capable of combusting more than 250 MMBtu/h heat input of fossil fuel and it does not supply/sell power to an electric utility grid.
NSPS 40 CFR 60 Subpart UUUU	Emissions Guidelines for Greenhouse Gas Emissions and Compliance Times for Electric Utility Generating Units	No	N/A	This facility is not an electric utility and therefore not subject 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	DHY-1 to DHY-2, CE-1 to CE-12	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 to DHY-2	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). The units will meet the requirements of this subpart as applicable. Since actual annual benzene emissions are less than 1 tpy, the facility is subject to only recordkeeping requirements. Per 40 CFR 63.760(b)(1)(iii)&(iv) fugitive components and compressors are not applicable as this facility is not a natural gas processing plant.
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	NESHAP for Major Boilers & Process Heaters	No	N/A	Per 40 CFR 63.7485, only HAP emissions from glycol dehydration units and storage vessels with the potential for flash emissions shall be aggregated for a major source determination. Based on the definition, this facility is not a major source of HAPs.

Federal Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification:
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 coal or oil fired electric utility steam generating units; therefore, this regulation does not apply.
MACT 40 CFR 63 Subpart ZZZZ	RICE MACT	Yes	CE-1 to CE-12	Per 40 CFR 63.6585 these engines are subject to this subpart and are considered new stationary RICE with site rated HP >500 located at an area source. These units will comply with the emissions and operating limitations.
40 CFR 64	Compliance Assurance Monitoring	Yes	AM-1 to AM-2	Per 40 CFR 64.2, The amine units (AM-1 to AM-2) are subject because they have the potential, pre-control device, emissions that are equal to or greater than 100%, in tons per year, required for a source to be classified as a major source. The units will comply with all applicable requirements upon issuance of the Title V permit for this facility.
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.

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 based on manufacturer's recommendations 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.

There are no alternate operating scenarios. All operations are covered under routine operations or SSM.

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.

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
CE-1 to CE-12	These units have not started	N/A

Section 18

Addendum for Streamline Applications

Do not print this section unless this is a streamline application.

Streamline Applications do not require a complete application. Submit Sections 1-A, 1-B, 1-D, 1-F, 1-G, 2-A, 2-C thru L, Sections 3 thru 8, Section 13, Section 18, Section 22, and Section 23 (Certification). Other sections may be required at the discretion of the Department. 20.2.72.202 NMAC Exemptions do not apply to Streamline sources. 20.2.72.219 NMAC revisions and modifications do not apply to Streamline sources, thus 20.2.72.219 type actions require a complete new application submittal. Please do not print sections of a streamline application that are not required.

This is not a Streamline Application.

Section 19

Requirements for Title V Program

Do not print this section unless this is a Title V application.

Who Must Use this Attachment:

* Any major source as defined in 20.2.70 NMAC.
* Any source, including an area source, subject to a standard or other requirement promulgated under Section 111 - Standards of Performance for New Stationary Sources, or Section 112 Hazardous Air Pollutants, of the 1990 federal Clean Air Act ("federal Act"). Non-major sources subject to Sections 111 or 112 of the federal Act are exempt from the obligation to obtain an 20.2.70 NMAC operating permit until such time that the EPA Administrator completes rulemakings that require such sources to obtain operating permits. In addition, sources that would be required to obtain an operating permit solely because they are subject to regulations or requirements under Section 112(r) of the federal Act are exempt from the requirement to obtain an Operating Permit.
* Any Acid Rain source as defined under title IV of the federal Act. The Acid Rain program has additional forms. See www.env.nm.gov/air-quality/air-quality-title-v-operating-permits-guidance-page/. Sources that are subject to both the Title V and Acid Rain regulations are encouraged to submit both applications simultaneously.
* Any source in a source category designated by the EPA Administrator ("Administrator"), in whole or in part, by regulation, after notice and comment.

This is not a Title V Application.

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 21

Addendum for Landfill Applications

Do not print this section unless this is a landfill application.

Landfill Applications are not required to complete Sections 1-C Input Capacity and Production Rate, 1-E Operating Schedule, 17 Compliance Test History, and 18 Streamline Applications. Section 12 – PSD Applicability is required only for Landfills with Gas Collection and Control Systems and/or landfills with other non-fugitive stationary sources of air emissions such as engines, turbines, boilers, heaters. All other Sections of the Universal Application Form are required.

EPA Background Information for MSW Landfill Air Quality Regulations: www.epa.gov/stationary-sources-air-pollution/clean-air-act-guidelines-and-standards-waste-management

NM Solid Waste Bureau Website: www.env.nm.gov/solid-waste/

This is not a landfill.

Universal Application 4

Air Dispersion Modeling Report

Refer to and complete Section 16 of the Universal Application form (UA3) to assist your determination as to whether modeling is required. If, after filling out Section 16, you are still unsure if modeling is required, e-mail the completed Section 16 to the AQB Modeling Manager for assistance in making this determination. If modeling is required, a modeling protocol would be submitted and approved prior to an application submittal. The protocol should be emailed to the modeling manager. A protocol is recommended but optional for minor sources and is required for new PSD sources or PSD major modifications. Fill out and submit this portion of the Universal Application form (UA4), the "Air Dispersion Modeling Report", only if air dispersion modeling is required for this application submittal. This serves as your modeling report submittal and should contain all the information needed to describe the modeling. No other modeling report or modeling protocol should be submitted with this permit application.

16-A: Identification

1	Name of facility:	Titan Treater Plant #2
2	Name of company:	Northwind Midstream Partners LLC
3	Current Permit number:	N/A
4	Name of applicant's modeler:	Bruce Ferguson
5	Phone number of modeler:	601-824-1860
6	E-mail of modeler:	bferguson@fce-engineering.com

16-B: Brief

1	Was a modeling protocol submitted and approved?	Yes☐	No☒
2	Why is the modeling being done?	New Facility	
3	Describe the permit changes relevant to the modeling.		
4	What geodetic datum was used in the modeling?	WGS84	
5	How long will the facility be at this location?	Indefinite	
6	Is the facility a major source with respect to Prevention of Significant Deterioration (PSD)?	Yes☐	No☒

16-B: Brief

7	Identify the Air Quality Control Region (AQCR) in which the facility is located	155	
8	List the PSD baseline dates for this region (minor or major, as appropriate).		
	NO2	3/16/1988	
	SO2	7/28/1978	
	PM10	2/20/1979	
	PM2.5	11/13/2013	
9	Provide the name and distance to Class I areas within 50 km of the facility (300 km for PSD permits).		
	104.6 east of Carlsbad Caverns National Park		
10	Is the facility located in a non-attainment area? If so describe below	Yes☐	No☒
11	Describe any special modeling requirements, such as streamline permit requirements.		
	None		

16-C: Modeling History of Facility

Describe the modeling history of the facility, including the air permit numbers, the pollutants modeled, the National Ambient Air Quality Standards (NAAQS), New Mexico AAQS (NMAAQS), and PSD increments modeled. (Do not include modeling waivers).

Pollutant	Latest permit and modification number that modeled the pollutant facility-wide.	Date of Permit	Comments
CO	none		
NO_2	none		
SO_2	none		
H_2S	none		
PM2.5	none		
PM10	none		
Lead	none		
Ozone (PSD only)	none		
NM Toxic Air Pollutants (20.2.72.402 NMAC)	none		

16-D: Modeling performed for this application

1

For each pollutant, indicate the modeling performed and submitted with this application.
Choose the most complicated modeling applicable for that pollutant, i.e., culpability analysis assumes ROI and cumulative analysis were also performed.

Pollutant	ROI	Cumulative analysis	Culpability analysis	Waiver approved	Pollutant not emitted or not changed.
CO	☒	☐	☐	☐	☐
NO_2	☒	☒	☐	☐	☐
SO_2	☒	☒	☒	☐	☐
H_2S	☒	☒	☒	☐	☐
PM2.5	☒	☒	☐	☐	☐
PM10	☒	☒	☐	☐	☐
Lead	☐	☐	☐	☐	☒
Ozone	☐	☐	☐	☐	☒
State air toxic(s) (20.2.72.402 NMAC)	☐	☐	☐	☐	☒

16-E: New Mexico toxic air pollutants modeling

1

List any New Mexico toxic air pollutants (NMTAPs) from Tables A and B in 20.2.72.502 NMAC that are modeled for this application.
None

2

List any NMTAPs that are emitted but not modeled because of stack height correction factor. Add additional rows to the table below, if required.

Pollutant	Emission Rate (pounds/hour)	Emission Rate Screening Level (pounds/hour)	Stack Height (meters)	Correction Factor	Emission Rate/ Correction Factor
None					

16-F: Modeling options

1

Was the latest version of AERMOD used with regulatory default options? If not explain below.	Yes☒	No☐
AERMOD Version 24142 was used in the analysis using the regulatory default option.		

16-G: Surrounding source modeling

1	Date of surrounding source retrieval	2/19/25 Downloaded from MergeMaster Web page.
2	If the surrounding source inventory provided by the Air Quality Bureau was believed to be inaccurate, describe how the sources modeled differ from the inventory provided. If changes to the surrounding source inventory were made, use the table below to describe them. Add rows as needed.	
	AQB Source ID	Description of Corrections
	38125R6	Emissions removed as it is one event per year lasting 6 hrs
	SSM Surrounding Sources Removed from Analysis per NMED Guideline Section 4.1.6	39992E2, 7643E3, 39782E3, 5515E4, 40554E6, 40795E6, 38313E8, 40258E8, 9292E10, 40142E10, 8695E11, 7803E12, 31865E12, 7803E13, 40159E13, 32333E14, 39785E14, 40747E14, 39140E15, 40136E15, 34629E16, 40136E16, 40872E16, 39004E17, 39145E17, 5515E18, 40265E18, 33319E19, 34418E19, 40853E19, 37580E20, 40211E20, 38292E21, 39591E21, 40211E21, 37960E22, 39591E22, 39823E23, 40192E23, 37956E24, 38270E24, 40192E24, 40192E25, 40221E25, 11000E26, 12523E26, 40192E26, 40221E26, 9292E28, 37766E28, 38441E31, 38863E33, 38909E34, 38441E35, 38909E35, 7689E36, 38441E36, 39871E36, 38838E39, 38838E40, 38838E42, 38438E47, 38438E48, 38438E49, 38342E56, 38342E59, 38342E62, 569E72, 30535R2, 569R30, 664R3, 7689R3, 40146R2, 39871R2, 38049R4, 7689R3, 40146R2, 39871R2, 38049R4, 38183R4, 38125R1, 39955R6, 39604R3, 40095R3, 38438R4, 5919R3, 38838R3, 40735R2, 39823R1, 8008@1, 8008R2, 5515R2, 39565E13, 39565E16, 8695@2, 40095E8, 38183R2
	39955 38439	For SO2 modeling, source locations were moved to correspond to aerial photo. Receptors within fence line were removed.
	38125E14	Changed the diameter of 0.61 m to the Table 38: Missing Stack Parameter Substitutions for Flares value of 2.79 m for SO2 of 90 lb/hr. Inventory diameter did not appear to account for assist gas required for elevated H2S.
	38125R2	Removed truck loading emissions as the source is an insignificant activity not required to be modeled.
	38125E11	SO2 emissions changed to normal operations listed in the application of 0.0036 lb/hr.
	39955E12 39955E11	H2S emissions removed. Application states “100% Vapor Recovery Unit (VRU) control controlling tank VOC and H2S vapors to TK-1-TK-2. VRUs are redundant. When one is down for maintenance the other will be in service.”
	38439E5	Changed to 21.89 lb/hr H2S as in application
	39823E13 39823E14 39823E15 39823E46 39823E47 39823E48 39823E49	Source changed from volume source to stack with parameters listed in application.
	28937@1	Exhaust changed to point source. Stack estimated at 25 ft with effective diameter of 5 feet. Velocity estimated based on baghouse flow listed in application of 47,000 acfm. Exhaust temp of 200 F assumed.
	39955R4	Changed to an area source encompassing the pipe rack.
	39955@1	Removed H2S truck loading emissions as the source is an insignificant activity not required to be modeled.
	7689E11	Changed the flare diameter to 3.43 meters from 0.61 meters based on the flare permitted flow rate of 5 MMscf/day and average MW of natural gas of 18.8.
	39871E12	The actual gas flow was changed from 3.3 ft3/s to 8.35 ft3/s and the natural gas Fw factor for natural gas.

16-G: Surrounding source modeling		
	38342	The facility was modeled as presented in the modeling files for NSR 7747-M6
	$PM_{10}/PM_{2.5}$ Analysis	Sources identified in the MergeMaster input file as greater than 10 km from the source were removed from the NAAQS source group.

16-H: Building and structure downwash

1	How many buildings are present at the facility?	1	
2	How many above ground storage tanks are present at the facility?	14	
3	Was building downwash modeled for all buildings and tanks? If not explain why below.	Yes☒	No☐
4	Building comments		

16-I: Receptors and modeled property boundary

1	"Restricted Area" is an area to which public entry is effectively precluded. Effective barriers include continuous fencing, continuous walls, or other continuous barriers approved by the Department, such as rugged physical terrain with a steep grade that would require special equipment to traverse. If a large property is completely enclosed by fencing, a restricted area within the property may be identified with signage only. Public roads cannot be part of a Restricted Area. A Restricted Area is required in order to exclude receptors from the facility property. If the facility does not have a Restricted Area, then receptors shall be placed within the property boundaries of the facility. Describe the fence or other physical barrier at the facility that defines the restricted area.					
	A fence will surround the facility. Receptors were placed at and beyond the fence line.					
2	Receptors must be placed along publicly accessible roads in the restricted area. Are there public roads passing through the restricted area?				Yes☐	No☒
3	Are restricted area boundary coordinates included in the modeling files?				Yes☐	No☐
4	Describe the receptor grids and their spacing. The table below may be used, adding rows as needed.					
	Grid Type	Shape	Spacing	Start distance from center of facility	End distance from center of facility	Comments
	Fence Line	Rectangle	50-meter			
	Cartesian	Round	50-meter	0	1 km	
	Cartesian	Round	100-meter	1 km	3-km	
	Cartesian	Round	250-meter	3-km	6-km	
	Cartesian	Round	500-meter	6-km	12-km	
	Cartesian	Round	1-km	12-km	50-km	
5	Describe receptor spacing along the fence line.					
	50-meter					
6	Describe the PSD Class I area receptors.					
	n/a					

16-J: Modeling Scenarios

1 Identify, define, and describe all modeling scenarios. Examples of modeling scenarios include using different production rates, times of day, times of year, simultaneous or alternate operation of old and new equipment during transition periods, etc. Alternative operating scenarios should correspond to all parts of the Universal Application and should be fully described in Section 15 of the Universal Application (UA3).

Normal – All sources and the acid gas flare and process flare with normal
AGFLSSM – All sources and process flare with normal emissions, acid gas flare with normal and SSM emissions
FL1SSM – All sources and acid gas flare with normal emissions, process flare with normal and SSM emissions

2 Which scenario produces the highest concentrations? Why?
PM, NOx and CO impacts were the highest for normal operations 1-hr due to the lower releases controlling the impact which are offset from the flare high impacts. The AGFLSSM scenario produced the highest SO2 impacts due to the magnitude of the SO_2 and H_2S emissions for that scenario.

	CO		NOx		PM2.5		PM10		SO2				H2S
Senario	1-hr	8-hr	1-hr	Annual	24-hr	Annual	24-hr	Annual	1-hr	3-hr	24-hr	Annual	1-hr
NORMAL	115.3268	70.38909	105.9161	8.14605	5.31000	1.14535	10.66012	3.85425	12.15405	14.34194	4.35565	0.60593	80.73818
AGFLSSM	115.3240	70.32833	105.9154		5.33410		10.66005		181.42402	201.1062	68.13948		106.8009
FL1SSM	115.3267	70.38936	105.9160		5.31007		10.66041		78.56749	89.71933	28.39031		106.8008

3 Were emission factor sets used to limit emission rates or hours of operation?
(This question pertains to the "SEASON", "MONTH", "HROFDY" and related factor sets, not to the factors used for calculating the maximum emission rate.) Yes☐ No☒

4 If so, describe factors for each group of sources. List the sources in each group before the factor table for that group. (Modify or duplicate table as necessary. It's ok to put the table below section 16-K if it makes formatting easier.)
Sources:

5

Hour of Day	Factor	Hour of Day	Factor								
1		13									
2		14									
3		15									
4		16									
5		17									
6		18									
7		19									
8		20									
9		21									
10		22									
11		23									
12		24									

If hourly, variable emission rates were used that were not described above, describe them below.

6 Were different emission rates used for short-term and annual modeling? If so describe below. Yes☐ No☒

16-K: NO_2 Modeling

1	Which types of NO_2 modeling were used? Check all that apply.	
	☒	ARM2
	☒	100% NO_X to NO_2 conversion
	☐	PVMRM
	☐	OLM
	☐	Other:
2	Describe the NO_2 modeling.	
	Full conversion was assumed in the SIL analysis. The ARM2 method was used in the cumulative analysis.	
3	Were default NO_2/NO_X ratios (0.5 minimum, 0.9 maximum or equilibrium) used? If not describe and justify the ratios used below.	Yes☒ No☐
4	Describe the design value used for each averaging period modeled.	
	1-hour: 98th percentile as calculated by AERMOD Annual Other (Describe): : highest of 5-years modeled	

16-L: Ozone Analysis

1	NMED has performed a generic analysis that demonstrates sources that are minor with respect to PSD do not cause or contribute to any violations of ozone NAAQS. The analysis follows. The basis of the ozone SIL is documented in *Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program*, EPA, April 17, 2018 and associated documents. NMED accepts this SIL basis and incorporates it into this permit record by reference. Complete documentation of the ozone concentration analysis using MERPS is included in the New Mexico Air Quality Bureau Air Dispersion Modeling Guidelines.	
2	The MERP values presented in Table 10 and Table 11 of the NM AQB Modeling Guidelines that produce the highest concentrations indicate that facilities emitting no more than 250 tons/year of NO_X and no more than 250 tons/year of VOCs will cause less formation of O_3 than the O_3 significance level. $$[O_3]_{8-hour} = \left(\frac{250 \frac{ton}{yr}}{340_{MERP_{NOX}}} + \frac{250 \frac{ton}{yr}}{4679_{MERP_{VOC}}} \right) \times 1.96\ \mu g/m^3$$ =1.546 µg/m³, which is below the significance level of 1.96 µg/m³. Sources that produce ozone concentrations below the ozone SIL do not cause or contribute to air contaminant levels exceeding the ozone NAAQS.	
3	Does the facility emit at least 250 tons per year of NO_X or at least 250 tons per year of VOCs? Sources that emit at least 250 tons per year of NO_X or at least 250 tons per year of VOCs are covered by the analysis above and require an individual analysis.	Yes☐ No☒

5 For new PSD Major Sources or PSD major modifications, if MERPs were used to account for ozone fill out the information below. If another method was used describe below.

NO_X (ton/yr)	$MERP_{NOX}$	VOCs (ton/yr)	$MERP_{VOC}$	$[O_3]_{8\text{-hour}}$

16-M: Particulate Matter Modeling

1	Select the pollutants for which plume depletion modeling was used.	
	☐	PM2.5
	☐	PM10
	☐	None
2	Describe the particle size distributions used. Include the source of information.	
	N/A	
3	Does the facility emit at least 40 tons per year of NO_X or at least 40 tons per year of SO_2? Sources that emit at least 40 tons per year of NO_X or at least 40 tons per year of SO_2 are considered to emit significant amounts of precursors and must account for secondary formation of PM2.5.	Yes☒ / No☐
4	Was secondary PM modeled for PM2.5?	Yes☐ / No☒

5 — If MERPs were used to account for secondary PM2.5 fill out the information below. If another method was used describe below.

Pollutant	NO_X	SO_2		$[PM2.5]_{24\text{-hour}}$
$MERP_{annual}$	26780	14978		0.164065749
$MERP_{24\text{-hour}}$	7331	1981		$[PM2.5]_{annual}$
Emission rate (ton/yr)	201.52	216.39		0.004394442

16-N: Setback Distances

1	Portable sources or sources that need flexibility in their site configuration require that setback distances be determined between the emission sources and the restricted area boundary (e.g. fence line) for both the initial location and future locations. Describe the setback distances for the initial location.
	N/A
2	Describe the requested, modeled, setback distances for future locations, if this permit is for a portable stationary source. Include a haul road in the relocation modeling.
	N/A

16-O: PSD Increment and Source IDs

1	The unit numbers in the Tables 2-A, 2-B, 2-C, 2-E, 2-F, and 2-I should match the ones in the modeling files. Do these match? If not, provide a cross-reference table between unit numbers if they do not match below.	Yes☒	No☐

Unit Number in UA-2	Unit Number in Modeling Files
DHY-1 SSM	SSMB
DHY-2 SSM	
SSMBD COMP	
SSMBD DEHY	
SSMBD Filters	
SSMBD PIPE	

16-O: PSD Increment and Source IDs

2	The emission rates in the Tables 2-E and 2-F should match the ones in the modeling files. Do these match? If not, explain why below.	Yes☐	No☐
3	Have the minor NSR exempt sources or Title V Insignificant Activities" (Table 2-B) sources been modeled?	Yes☐	No☐

4 Which units consume increment for which pollutants?

Unit ID	NO_2	SO_2	PM10	PM2.5

5	PSD increment description for sources. (for unusual cases, i.e., baseline unit expanded emissions after baseline date).	

6	Are all the actual installation dates included in Table 2A of the application form, as required? This is necessary to verify the accuracy of PSD increment modeling. If not please explain how increment consumption status is determined for the missing installation dates below.	Yes☐	No☐

16-P: Flare Modeling

1 For each flare or flaring scenario, complete the following

	Flare ID (and scenario)	Average Molecular Weight	Gross Heat Release (cal/s)	Effective Flare Diameter (m)
	AGFL	19.27	153,277.81	0.35
	AGFLSSM	21.25	51,280,012.36	6.32
	FL1	18.84	884,176.73	0.84
	FL1SSM	26.3	48,461,428.15	6.04

16-Q: Volume and Related Sources

1	Were the dimensions of volume sources different from standard dimensions in the Air Quality Bureau (AQB) Modeling Guidelines? If not please explain how increment consumption status is determined for the missing installation dates below.	Yes☐	No☐

2	Describe the determination of sigma-Y and sigma-Z for fugitive sources.
3	Describe how the volume sources are related to unit numbers. Or say they are the same.
	Describe any open pits.

4	
5	Describe emission units included in each open pit.

16-R: Background Concentrations

1	Were NMED provided background concentrations used? Identify the background station used below. If non-NMED provided background concentrations were used describe the data that was used.	Yes☐	No☒
	CO: N/A		
	NO_2: Outside Carlsbad (350151005)		
	PM2.5: Hobbs-Jefferson (350450019)		
	PM10: Hobbs-Jefferson (350250008)		
	SO_2: N/A		
	Other:		
	Comments: The monitor design values posted at https://www.epa.gov/air-trends/air-quality-design-values#report were used for NO2 and PM2.5. This was approved by Sahil Kassanjee by a 2/27/25 email. The PM10 background was taken from the NMED guideline as there was no design value posted for this pollutant.		
2	Were background concentrations refined to monthly or hourly values? If so describe below.	Yes☐	No☒

16-S: Meteorological Data

1	Was NMED provided meteorological data used? If so select the station used. Carlsbad	Yes☒	No☐
2	If NMED provided meteorological data was not used describe the data set(s) used below. Discuss how missing data were handled, how stability class was determined, and how the data were processed.		

16-T: Terrain

1	Was complex terrain used in the modeling? If not, describe why below.	Yes☒	No☐
2	What was the source of the terrain data?		
	Downloaded through USGS at https://apps.nationalmap.gov/viewer/		

16-U: Modeling Files

1	Describe the modeling files:

	File name (or folder and file name)	Pollutant(s)	Purpose (ROI/SIA, cumulative, culpability analysis, other)
	SIA/CO.zip	CO	SIA
	SIA/H2S.zip	H2S	
	SIA/NOx.zip	NOx	
	SIA/PM10.zip	PM10	
	SIA/PM25.zip	PM2.5	
	SIA/SO2.zip	SO2	SIA 3-hr, 24-hr
	SIA/SO2_NAAQS.zip	SO2	1-hr, Annual
	CIA/H2S.zip Zip.(H2S.AD/exceedance.MAX) Zip(H2S.evo)	H2S	CIA Threshold file for H2s exceedances Event output file with source contributions
	CIA/NO2.zip	NO2	CIA
	CIA/PM10.zip	PM10	CIA
	CIA/PM25.zip	PM2.5	CIA
	CIA/SO2_INC.zip .zip(SO2_INC/[year]/SO2.AD/exceed3.max & exceed24.max	SO2	CIA 3-hr, 24-hr Threshold exceedance files for 3-hr and 24-hr avg period
	CIA/SO2_Refined.zip	SO2	CIA 1-hr, Annual
	Surrounding Sources	All pollutants	NMED Mergemaster surrounding sources and excluded SSM sources.
	CIA/Culpability/ H2S Culpability 3_3_25.xlsx, SO2 1-hr Culpability.xlsx, SO2 Increment Culpability.xlsx	H2S, SO2	Summary of Source contribution
	CIA/Culpability/ SO2 2017 3hr Inc.zip, SO2 2020 24hr Inc.zip	SO2	Culpability modeling of years with exceedances of the 3-hr and 24-hr average.

16-V: PSD New or Major Modification Applications (Not Applicable)

1	A new PSD major source or a major modification to an existing PSD major source requires additional analysis. Was preconstruction monitoring done (see 20.2.74.306 NMAC and PSD Preapplication Guidance on the AQB website)?	Yes☐	No☐
2	If not, did AQB approve an exemption from preconstruction monitoring?	Yes☐	No☐
3	Describe how preconstruction monitoring has been addressed or attach the approved preconstruction monitoring or monitoring exemption.		
4	Describe the additional impacts analysis required at 20.2.74.304 NMAC.		
5	If required, have ozone and secondary PM2.5 ambient impacts analyses been completed? If so describe below.	Yes☐	No☐

16-W: Modeling Results

1	If ambient standards are exceeded because of surrounding sources, a culpability analysis is required for the source to show that the contribution from this source is less than the significance levels for the specific pollutant. Was culpability analysis performed? If so describe below.	Yes☒	No☐
	A culpability analysis was performed for the H2S impacts by including a threshold violation file for each impact exceeding the NMAAQS for H2S. The AERMOD input file created a source contribution input file that was run to determine the source contribution for each exceedance. The Titan 2 impacts at each event were compared to the H_2S modeling significance level and the contribution for the Titan 2 facility was found to be insignificant at each event. The MAXDCONT option was included in the SO2 NAAQS analysis. One receptor was found to exceed the NAAQS and the impacts from the Titan 2 facility were found to be below the modeling significance level.		
2	Identify the maximum concentrations from the modeling analysis. Rows may be modified, added and removed from the table below as necessary.		

Pollutant, Time Period and Standard	Modeled Facility Concentration (µg/m3)	Modeled Concentration with Surrounding Sources (µg/m3)	Secondary PM (µg/m3)	Background Concentration (µg/m3)	Cumulative Concentration (µg/m3)	Value of Standard (µg/m3)	Percent of Standard	Location		
								UTM E (m)	UTM N (m)	Elevation (ft)
CO 1-hr SIL	115.32669	N/A	N/A	N/A	115.32669	2000	5.8	663248.08	3545486.62	895.02
CO 8-hr SIL	70.38936	N/A	N/A	N/A	70.38936	500	14.1	663297.43	3545485.41	894.73
NO2 1-hr NAAQS		73.61416	N/A	38	128.1	188.03	68.1	662800.00	3545550.00	895.88
NO2 Annual NMAAQS		8.45754	N/A	9.3	17.8	99.66	17.9	662801.37	3545514.45	896.06
NO2 Annual PSD		8.45754	N/A	6.1	17.8	25	71.2	662801.37	3545514.45	896.06
PM2.5 annual NAAQS		1.49804	0.0044	6.6	8.60	9	95.6	662801.37	3545514.45	896.06
PM2.5 annual PSD		1.55691	0.0044	N/A	1.56	4	39.0	662801.37	3545514.45	896.06
PM2.5 24-hour NAAQS		3.92245	0.1641	20	24.09	35	68.8	662900.00	3544850.00	892.83
PM2.5 24-hour PSD		5.11853	0.1641	N/A	5.28	9	58.7	662850.00	3544850.00	892.98
PM10 24-hour NAAQS		10.74441	N/A	37.3	48.0	150	32.0	662600.00	3545400.00	893.91
PM10 24-hour PSD		12.48320	N/A	N/A	12.48320	30	41.6	662801.37	3545514.45	896.06
PM10 annual PSD		4.74890	N/A	N/A	4.74890	17	27.9	662801.37	3545514.45	896.06
SO2 annual PSD		15.11422	N/A	N/A	15.11422	20	75.6	662300.00	3545850.00	894.78
SO2 24-hr PSD		78.31956	N/A	N/A	78.31956	91	86.1	662621.71	3545468.21	894.06

Pollutant, Time Period and Standard	Modeled Facility Concentration (µg/m3)	Modeled Concentration with Surrounding Sources (µg/m3)	Secondary PM (µg/m3)	Background Concentration (µg/m3)	Cumulative Concentration (µg/m3)	Value of Standard (µg/m3)	Percent of Standard	Location		
								UTM E (m)	UTM N (m)	Elevation (ft)
SO2 3-hr PSD		265.21264	N/A	N/A	265.21264	512	51.8	662600.00	3545400.00	893.91
SO2 1-hr NAAQS		193.66849	N/A	N/A	193.66849	196.4	98.6	662800.00	3544000.00	889.3
H2S ½ hr NMAAQS		129.90696	N/A	N/A	129.90696	139.4	93.2	664400.00	3543700.00	888.37

16-X: Summary/conclusions

	A statement that modeling requirements have been satisfied and that the permit can be issued.
1	The proposed facility emissions were modeled to determine the significant impact surrounding the facility. Three scenarios were modeled, normal operations, normal operations plus Acid Gas Flare SSM emissions and normal operations plus process flare SSM emissions. The maximum impact for all scenarios occurs within the receptor grid at 100-meter spacing, i.e., within 3-km of the facility. In general, the cumulative impact analysis was performed only with those receptors that were impacted significantly in the signification impact analysis. For the SO2 1-hr impacts, the significant impact distance was within 1-km of the facility. For the scenarios with SSM emissions, all receptors within the domain (50 km) had significant impacts. To reduce the modeling time, the receptors carried forward to the cumulative analysis were those with a significant impact for the 3-hr, 24-hr or annual averaging period or receptors within 1-km from the facility. Surrounding sources were included in the model using the MergeMaster input files downloaded from the NMED website. Sources in the files identified as SSM sources were removed from the surrounding source inventory. For the PM_{10} and $PM_{2.5}$ analysis, sources greater than 10 km from the proposed project were removed from the NAAQS source group, sources greater that 10 km are accounted for in the monitored background value.. Except for the ½ hr H2S, 1-hr SO2 NAAQS and 3-hr SO2 PSD increment, all pollutants/averaging periods were compliant with the standards as presented above. A culpability analysis was performed for the pollutant/averaging periods with an exceedance of the standards. The contribution of the combined impacts from the proposed source Titan #2 and the existing Titan #1 at the time and location of the exceedance was below the modeling significance level for all events. The proposed Titan #2 Treating Plant, therefore, does not cause or contribute to an existing exceedance of any air quality standard and the permit can be issued as proposed in the application.

Section 22: Certification

Company Name: Northwind Midstream Partners, LLC

I, Josh Thomas, 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 February, 2025, upon my oath or affirmation, before a notary of the State of

Texas.

*Signature

February 20, 2025
Date

Josh Thomas
Printed Name

SVP Operations
Title

Scribed and sworn before me on this 20th day of February, 2025.

My authorization as a notary of the State of Texas expires on the

6th day of September, 2027.

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

Notary's Signature

February 20, 2025
Date

Anna Beltran
Notary's Printed Name

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

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		March 4, 2025
Permittee/Company Contact	**Phone**	**Email**
Jillian Yamartino	(346) 613-1471	jyamartino@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. *Northwind became aware that construction had started prior to the issuance of the NSR permit No. 7747M6. Northwind immediately self-reported to NMED on August 23, 2024 and initiated a plan to shut down unpermitted construction activities. On September 11, 2024 , AQB C&E Section Chief issued approval of Northwind's Enforcement Discretion Application to resume and complete construction under the significant revision to air permit 7747M5. Air permit 7747M6 was issued on November 4, 2024.*	