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Dallas, TX 75201
Office: 214.420.4950
targaresources.com

August 1, 2024

Air Permits Initial Review Team (APIRT)
Texas Commission on Environmental Quality
12100 Park 35 Circle
Building C, Third Floor, MC-161
Austin, TX 78753

Submitted via STEERS

Re: Oil and Gas Non-Rule Standard Permit - Revision Application
Charlie Brown Compressor Station, RN110063773
Targa Midstream Services LLC, CN601301559
Reagan County, Texas

Dear APIRT:

Targa Midstream Services LLC (Targa) is submitting the attached revision application to authorize emissions for the proposed sources under the Oil and Gas Non-Rule Standard Permit at the Charlie Brown Compressor Station, located in Reagan County, Texas.

This application demonstrates that the site complies with the Oil and Gas Non-Rule Standard Permit requirements and therefore may be authorized to operate under the specified standard permit provisions.

If you should require additional information, or have any questions regarding the information presented in this application, please contact me at 214-420-4950 or via email at lslater@targaresources.com.

Sincerely,

Lyndsie Slater

Lyndsie Slater
Environmental Specialist

cc: Mr. Cain Cline, Air/Waste/Water Section Manager, TCEQ Region 8 – San Angelo
Mr. Jimmy Oxford, Targa Midstream Services LLC
Targa Environmental Files

Form PI-1S
Registrations for Air Standard Permit
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Texas Commission on Environmental Quality

I. Registrant Information	
A. Company or Other Legal Customer Name:	
Targa Midstream Services LLC	
B. Company Official Contact Information ☒ Mr. ☐ Mrs. ☐ Ms. ☐ Other:	
Name: Jimmy Oxford	
Title: Vice President, Operations	
Mailing Address: 4401 N I-35 Unit 303	
City: Denton	
State: Texas	
ZIP Code: 76207	
Telephone No.: 940-220-2493	
Fax No.:	
Email Address: joxford@targaresources.com	
<i>All permit correspondence will be sent via e-mail.</i>	
C. Technical Contact Information ☐ Mr. ☐ Mrs. ☒ Ms. ☐ Other:	
Name: Lyndsie Slater	
Title: Environmental Specialist	
Company Name: Targa Midstream Services LLC	
Mailing Address: 3100 McKinnon St., Suite 800	
City: Dallas	
State: Texas	
ZIP Code: 75201	
Telephone No.: 214-420-4950	
Fax No.:	
Email Address: lslater@targaresources.com	
II. Facility and Site Information	
A. Name and Type of Facility	
Facility Name: Charlie Brown Compressor Station	
Type of Facility: ☒ Permanent ☐ Temporary	

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II. Facility and Site Information (continued)
For portable units, please provide the serial number of the equipment being authorized below.
Serial No(s):
B. Facility Location Information
Street Address: N/A
If there is no street address, provide written driving directions to the site and provide the closest city or town, county and ZIP code for the site (attach description if additional space is needed).
FROM BIG LAKE TAKE STATE HWY 137 N FOR 12.3 MILE THEN CONTINUE STRAIGHT ONTO FARM TO MARKET 33 N FOR 13.4 MILE TURN RIGHT ON FM2600 FOR 6.6 MILE
City: Big Lake
County: Reagan
ZIP Code: 76932
C. Core Data Form (required for Standard Permits 6006, 6007, and 6013).
Is the Core Data Form (TCEQ Form 10400) attached? ☐ YES ☒ NO
Customer Reference Number (CN): CN601301559
Regulated Entity Number (RN): RN110063773
D. TCEQ Account Identification Number (if known): RCA011K
E. Type of Action
☐ Initial Application ☒ Change to Registration ☐ Renewal ☐ Renewal Certification
For Change to Registration, Renewal, or Renewal Certification actions provide the following:
Registration Number: 152619
Expiration Date: 12/19/2028
F. Standard Permit Claimed: 6002 (Oil and Gas Facilities)
G. Previous Standard Exemption or PBR Registration Number:
Is this authorization for a change to an existing facility previously authorized under a standard exemption or PBR? ☐ YES ☒ NO
If "YES," enter previous standard exemption number(s) and PBR registration number(s), and associated effective date in the spaces provided below.

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II. Facility and Site Information (continued)
H. Other Facilities at this Site Authorized by Standard Exemption, PBR, or Standard Permit
Are there any other facilities at this site which are authorized by an Air Standard Exemption, PBR, or Standard Permit? ☒ YES ☐ NO
If "YES," enter standard exemption number(s), PBR registration number(s), and Standard Permit registration number(s), and associated effective date in the spaces provided below.
Standard Exemption, PBR Registration, and Standard Permit Registration Number(s) and Effective Date(s)
106.263 11/1/2001
I. Other Air Preconstruction Permits
Are there any other air preconstruction permits at this site? ☐ YES ☒ NO
If "YES," enter permit number(s) in the spaces provided below.
J. Affected Air Preconstruction Permits
Does the standard permit directly affect any permitted facility? ☐ YES ☒ NO
If "YES," enter permit number(s) in the spaces provided below.
K. Federal Operating Permit (FOP) Requirements
Is this facility located at a site which is required to obtain a FOP pursuant to 30 TAC Chapter 122? ☒ YES ☐ NO ☐ To Be Determined
Check the requirements of 30 TAC Chapter 122 that will be triggered if this standard permit is approved (<i>check all that apply</i>).
☐ Initial application for an FOP ☐ Significant Revision for an SOP ☐ Minor Revision for an SOP
☐ Operational Flexibility/Off-Permit Notification for an SOP ☒ Revision for GOP
☐ To Be Determined ☐ None
Identify the type(s) of FOP issued and/or FOP application(s) submitted/pending for the site. (<i>check all that apply</i>)
☐ SOP ☒ GOP ☒ GOP application/revision (submitted or under APD review)
☐ N/A ☐ SOP application/revision (submitted or under APD review)

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III. Fee Information (go to www.tceq.texas.gov/epay to pay online)
A. Fee Amount: \$850.00
B. Voucher number from ePay:
IV. Public Notice (if applicable)
A. Responsible Person ☐ Mr. ☐ Mrs. ☐ Ms. ☐ Other:
Name:
Title:
Mailing Address:
City:
State:
ZIP Code:
Telephone No.:
Fax No.:
Email Address:
B. Technical Contact ☐ Mr. ☐ Mrs. ☐ Ms. ☐ Other:
Name:
Title:
Company:
Mailing Address:
City:
State:
ZIP Code:
Telephone No.:
Fax No.:
Email Address:
C. Bilingual Notice
Is a bilingual program required by the Texas Education Code in the School District? ☐ YES ☐ NO
Are the children who attend either the elementary school or the middle school closest to your facility eligible to be enrolled in a bilingual program provided by the district? ☐ YES ☐ NO

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IV. Public Notice (continued) (if applicable)		
If "YES," list which language(s) are required by the bilingual program?		
D. Small Business Classification and Alternate Public Notice		
Does this company (including parent companies and subsidiary companies) have fewer than 100 employees or less than \$6 million in annual gross receipts?	☐ YES	☐ NO
Is the site a major source under 30 TAC Chapter 122, FOP Program?	☐ YES	☐ NO
Are the site emissions of any individual regulated air contaminant equal to or greater than 50 tpy?	☐ YES	☐ NO
Are the site emissions of all regulated air contaminant combined equal to or greater than 75 tpy?	☐ YES	☐ NO
V. Renewal Certification Option		
A. Does the permitted facility emit an air contaminant on the Air Pollutant Watch List, and is the permitted facility located in an area on the watch list?	☐ YES	☐ NO
B. For facilities participating in the Houston/Galveston/Brazoria area (HGB) cap and trade program for highly reactive VOCs (HRVOCs), do the HRVOCs need to be speciated on the maximum allowable emission rates table (MAERT)?	☐ YES	☐ NO
C. Does the company and/or site have an unsatisfactory compliance history?	☐ YES	☐ NO
D. Are there any applications currently under review for this standard permit registration?	☐ YES	☐ NO
E. Are scheduled maintenance, startup, or shutdown emissions required to be included in the standard permit registration at this time?	☐ YES	☐ NO
F. Are any of the following actions being requested at the time of this renewal:	☐ YES	☐ NO
1. Are there any facilities that have been permanently shutdown that are proposed to be removed from the standard permit?	☐ YES	☐ NO
2. Do changes need to be made to the standard permit to remain in compliance?	☐ YES	☐ NO
3. Are sources or facilities that have always been present and represented, but never identified in the standard permit registration, proposed to be included with this renewal?	☐ YES	☐ NO
4. Are there any changes to the current emission rates table being proposed?	☐ YES	☐ NO
<i>Note: If answers to all of the questions in Section V. Renewal Certification Option are "NO," use the certification option and skip to Section VII. of this form. If the answers to any of the questions in Section V. Renewal Certification Option are "YES," the certification option cannot be used.</i>		
<i>*If notice is applicable and comments are received in response to the public notice, the application does not qualify for the renewal certification option.</i>		

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VI. Technical Information Including State and Federal Regulatory Requirements

Place a check next to the appropriate box to indicate what you have included in your submittal.

Note: Any technical or essential information needed to confirm that facilities are meeting the requirements of the standard permit must be provided. Not providing key information could result in an automatic deficiency and voiding of the project.

A. Standard Permit Requirements

(Checklists are optional; however, your review will go faster if you provide applicable checklists)

Did you demonstrate that the general requirements in 30 TAC Sections 116.610 and 116.615 are met? ☒ YES ☐ NO

Did you demonstrate that the individual requirements of the specific standard permit are met? ☒ YES ☐ NO

B. Confidential Information (All pages properly marked "CONFIDENTIAL") ☐ YES ☒ NO

C. Process Flow Diagram ☒ YES ☐ NO

D. Process Description ☒ YES ☐ NO

E. Maximum Emissions Data and Calculations ☒ YES ☐ NO

F. Plot Plan ☐ YES ☒ NO

G. Projected Start Of Construction Date, Start Of Operation Date, and Length of Time at Site: ☒ YES ☐ NO

Projected Start Of Construction (provide date): **N/A**

Projected Start Of Operation (provide date): **N/A**

Length of Time at the Site:

VII. Delinquent Fees and Penalties

This form **will not be processed** until all delinquent fees and/or penalties owed to the TCEQ or the Office of the Attorney General on behalf of the TCEQ are paid in accordance with the Delinquent Fee and Penalty Protocol. For more information regarding Delinquent Fees and Penalties, go to the TCEQ Web site at:

www.tceq.texas.gov/agency/financial/fees/delin/index.html.

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VIII. Signature Requirements

The signature below confirms that I have knowledge of the facts included in this application and that these facts are true and correct to the best of my knowledge and belief. I further state that to the best of my knowledge and belief, the project for which application is made will not in any way violate any provision of the Texas Water Code (TWC), Chapter 7; the Texas Health and Safety Code, Chapter 382, the Texas Clean Air Act (TCAA) the air quality rules of the Texas Commission on Environmental Quality; or any local governmental ordinance or resolution enacted pursuant to the TCAA. I further state that I understand my signature indicates that this application meets all applicable nonattainment, prevention of significant deterioration, or major source of hazardous air pollutant permitting requirements. The signature further signifies awareness that intentionally or knowingly making or causing to be made false material statements or representations in the application is a criminal offense subject to criminal penalties.

Name (printed): **Jimmy Oxford**

Signature (original signature required): **(e-signed via STEERS)**

IX. Copies of the Registration

The PI-1S application must be submitted through ePermits. No additional copies need to be sent to the Regional Office or local Air Pollution Control Program(s). The link to ePermits can be found here: www3.tceq.texas.gov/steers/.

TCEQ OIL AND GAS NON-RULE STANDARD PERMIT Revision Application



**Targa Midstream Services LLC
Charlie Brown Compressor Station**

Big Lake, Reagan County, Texas

Prepared By:

ALTAMIRA-US, LLC
525 Central Park Drive, Ste. 500
Oklahoma City, Oklahoma 73105

July 2024

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Project Overview

Charlie Brown Compressor Station
Targa Midstream Services LLC
TCEQ Oil and Gas Non-Rule Standard Permit
July 2024

Project Information

Section 1.1

General Information			
Company Name	Targa Midstream Services LLC		
Site Name	Charlie Brown Compressor Station		
Authorization	Oil and Gas Non-Rule Standard Permit		
Application Type	Revision Application		
SIC Code	4922		
NAICS	486210		
Street Address	N/A		
Nearest City or Town	Big Lake		
Zip Code	76932		
County	Reagan		
Area Attainment Status	Classified as attainment or unclassified for all pollutants Source: U.S. EPA Green Book; http://www3.epa.gov/airquality/greenbook/anayo_tx.html		
TCEQ Region	Region 8, San Angelo		
Latitude	31.549200		
Longitude	-101.368360		
State	Texas		
Driving Directions	FROM BIG LAKE TAKE STATE HWY 137 N FOR 12.3 MILE THEN CONTINUE STRAIGHT ONTO FARM TO MARKET 33 N FOR 13.4 MILE TURN RIGHT ON FM2600 FOR 6.6 MILE		
Distance to Nearest Property Line	≥ 50 ft		
Distance to Nearest Receptor	≥ 5,000 ft		
Customer Number	CN601301559		
Regulated Number	RN110063773		
TCEQ Account Number	RCA011K		
Permit/Registration Number	152619		12/19/2028
Title V Permit Number	GOP	O-4143	
Date of Application	July 2024		

Charlie Brown Compressor Station
Targa Midstream Services LLC
TCEQ Oil and Gas Non-Rule Standard Permit
July 2024

Project Information

Section 1.1

Contact Information	Technical Contact	Responsible Official
Contact Name	Lyndsie Slater	Jimmy Oxford
Organization	Targa Midstream Services LLC	Targa Midstream Services LLC
Title	Environmental Specialist	Vice President, Operations
Address	3100 McKinnon St., Suite 800	4401 N I-35 Unit 303
City	Dallas	Denton
State	Texas	Texas
Zip	75201	76207
Telephone	214-420-4950	940-220-2493
Email	lslater@targaresources.com	joxford@targaresources.com

Project Scope

Targa is removing equipment from the compressor station. Removed equipment includes engines CM-7, CM-8, CM-9, and CM-12, emergency generator GEN-3, glycol heater HTR-3, and glycol dehydration unit DEHY-3. Targa is also revising the fugitive calculations and all equipment associated with updated gas and condensate analyses.

The purpose of this project is to register the following revisions associated with the Charlie Brown Compressor Station.

- Remove four (4) natural gas-fueled internal combustion engines (EPNs: CM-7, CM-8, CM-9, CM-12).
- Remove one (1) natural gas-fueled emergency generator engine (EPN: GEN-3).
- Remove one (1) glycol reboiler (EPN: HTR-3).
- Remove one (1) glycol dehydration unit (FIN: DEHY-3).

Emissions from planned maintenance, startup, and shutdown (MSS) activities (FINs/EPNs: MSS) are authorized under the NRSP, with blasting and coating being authorized under 30 TAC §106.263.

This project includes the emission sources listed in the table at the end of this section. This application provides the information necessary to demonstrate compliance with all applicable state and federal standards and authorization being claimed.

Project Information

Section 1.1

Process Description

The Charlie Brown CS is a natural gas compressor station. Natural gas from area wells is sent to the compressor station through gathering flow lines. The natural gas flows through the initial/inlet two-phase separator/scrubber to remove a mixture of produced water and condensate in the natural gas stream prior to entry into the natural gas compressors on site. Separated natural gas then enters into one of eight (8) natural gas compressors at the site (Emission Point Numbers [EPNs] CM-1 through CM-6, CM-10, and CM-11). All compressor engines are equipped with oxidation catalyst systems or non-selective catalytic reduction systems, as applicable. Natural gas used as fuel for each compressor engine is pipeline quality natural gas.

The compressors raise the discharge pressure of the gas in the pipeline to overcome the effect of frictional losses in the pipeline downstream of the station or from pressure losses/changes within the facility, in order to maintain the required suction pressure at the next downstream facility. The volume of gas flowing and the amount of frictional losses in the pipeline are heavily dependent on both the field conditions and downstream market conditions, causing wide pressure variations. The compressed gas is discharged from the station via pipeline.

After compression and before the station discharges the gas, the gas passes through one of two glycol dehydration units (EPNs DEHY-1 and DEHY-2) to remove water from the gas to prevent hydrates forming in the pipeline. The glycol dehydrator flash tank vapors are recycled back to the station inlet. Vapors from the glycol still vents are condensed using JATCO Benzene, Toluene, Ethylbenzene and Xylene (BTEx) condensers. Non-condensable vapors are routed to glow-plug equipped reboilers (EPNs HTR-1 and HTR-2) with 98% destruction efficiency.

The high-pressure liquids that fall out when the gas is compressed are sent to the pressurized condensate tank (EPN TK-1). Liquids in TK-1 are periodically loaded into pressurized tank trucks for transport off-site (EPN PL). The liquids from initial separator are routed to one condensate tank (EPN TK-2) and one produced water tank (EPN TK-3). Liquids in TK-2 and TK-3 are periodically loaded in a tanker truck for transport off-site (EPN L-1).

MSS activities are also performed at the site to ensure the site continues to operate in a manner that is safe, efficient, and environmentally sound. These periodic maintenance activities (planned and predictable) include the following activities:

Project Information

Section 1.1

- Compressor blowdowns;
- Pigging and purging pipeline;
- Piping from skid to compressor blowdowns;
- Vessel blowdowns;
- Pipeline maintenance;
- Tank degassing;
- Discharge meter blowdowns;
- Surface coating and abrasive blasting; and
- Low emitting MSS activities.

The facility is equipped with two (2) emergency and/or limited use engines (EPNs GEN-1 and GEN-2). Use of the engines for emergencies is unlimited.

There are miscellaneous tanks supporting operation and maintenance at the site include the following:

- Two (2) methanol tanks (EPNs TK-4, TK-8);
- Two (2) lube oil tanks (EPNs TK-5, TK-9);
- Two (2) antifreeze tanks (EPNs TK-6, TK-10); and
- Two (2) TEG tanks (EPNs TK-7, TK-11)

With the exception of the methanol tanks, all ancillary tanks are assumed to have negligible emissions (i.e., less than 0.01 lb/hr and less than 0.01 tpy of volatile organic compound [VOC] emissions) due to low throughput, low VOC content, and/or low vapor pressure of the contents.

Fugitive equipment leaks have also been quantified as part of this application (EPN FUG-1).

Site-wide Throughputs			
Product	Maximum Daily	Average Daily	Annual
Condensate	1,029 bbl/day	1 bbl/day	547 bbl/yr
Produced Water	2,571 bbl/day	36 bbl/day	13,304 bbl/yr

Sulfur Content	
Maximum H ₂ S Content of Production (ppm _v)	≤10.0
Is the production sweet or sour?	Sweet

Charlie Brown Compressor Station
Targa Midstream Services LLC
TCEQ Oil and Gas Non-Rule Standard Permit
July 2024

Project Information

Section 1.1

Site Operations, Equipment, and Emission Sources

Equipment/Activity Category	Source Name:	EPN(s):	FIN(s):	Description
Compressor Engine	Caterpillar 3516J Compressor Engine	CM-1	CM-1	1380-hp 4 Stroke, Lean Burn engine
Compressor Engine	Caterpillar 3516J Compressor Engine	CM-2	CM-2	1380-hp 4 Stroke, Lean Burn engine
Compressor Engine	Caterpillar 3516J Compressor Engine	CM-3	CM-3	1380-hp 4 Stroke, Lean Burn engine
Compressor Engine	Caterpillar 3516J Compressor Engine	CM-4	CM-4	1380-hp 4 Stroke, Lean Burn engine
Compressor Engine	Caterpillar 3516J Compressor Engine	CM-5	CM-5	1380-hp 4 Stroke, Lean Burn engine
Compressor Engine	Caterpillar 3516J Compressor Engine	CM-6	CM-6	1380-hp 4 Stroke, Lean Burn engine
Compressor Engine	Caterpillar 3516J Compressor Engine	CM-10	CM-10	1380-hp 4 Stroke, Lean Burn engine
Compressor Engine	Caterpillar 3516 Compressor Engine	CM-11	CM-11	1085-hp 4 Stroke, Lean Burn engine
Emergency Engine	PSI Industrial 8.8L	GEN-1	GEN-1	245-hp 4 Stroke, Rich Burn engine
Emergency Engine	PSI Industrial 8.8L	GEN-2	GEN-2	245-hp 4 Stroke, Rich Burn engine
Fixed Roof Storage Tank	Pressurized Condensate Tank	TK-1	TK-1	60,000-gal Horizontal Pressurized Condensate Tank
Fixed Roof Storage Tank	Condensate Tank	TK-2	TK-2	210-bbl VFR; Annual Throughput = 547 bbl/yr/tank
Fixed Roof Storage Tank	Produced Water Tank	TK-3	TK-3	210-bbl VFR; Annual Throughput = 13,304 bbl/yr/tank
Fixed Roof Storage Tank	Methanol Tank	TK-4	TK-4	2,000-gal Horizontal Methanol Tank

**Charlie Brown Compressor Station
Targa Midstream Services LLC
TCEQ Oil and Gas Non-Rule Standard Permit
July 2024**

Project Information

Section 1.1

Site Operations, Equipment, and Emission Sources

Equipment/Activity Category	Source Name:	EPN(s):	FIN(s):	Description
Fixed Roof Storage Tank	Lube Oil Tank	TK-5	TK-5	2,000-gal Horizontal Lube Oil Tank
Fixed Roof Storage Tank	Antifreeze Tank	TK-6	TK-6	1,000-gal Horizontal Antifreeze Tank
Fixed Roof Storage Tank	Triethylene Glycol Tank	TK-7	TK-7	740-gal Horizontal Triethylene Glycol Tank
Fixed Roof Storage Tank	Methanol Tank	TK-8	TK-8	2,000-gal Horizontal Methanol Tank
Fixed Roof Storage Tank	Lube Oil Tank	TK-9	TK-9	2,000-gal Horizontal Lube Oil Tank
Fixed Roof Storage Tank	Antifreeze Tank	TK-10	TK-10	1,000-gal Horizontal Antifreeze Tank
Fixed Roof Storage Tank	Triethylene Glycol Tank	TK-11	TK-11	740-gal Horizontal Triethylene Glycol Tank
Boiler	Glycol Heater	HTR-1	HTR-1	--
Boiler	Glycol Heater	HTR-2	HTR-2	--
Glycol Unit	Glycol Heater/Glycol Dehy Unit 1	DEHY-1	DEHY-1	2.5 MMscfd TEG Dehy Unit. Flash Tank & Regenerator Still Vent controlled by
Glycol Unit	Glycol Heater/Glycol Dehy Unit 2	DEHY-2	DEHY-2	2.5 MMscfd TEG Dehy Unit. Flash Tank & Regenerator Still Vent controlled by
Fugitives	Piping Component Fugitives	FUG-1	FUG-1	Subject to NSPS 0000a & NRSP LDAR programs
Truck Loading	Condensate Loading	L-1	L-1	Uncontrolled loading; 22,968 bbl/yr of Condensate loaded
Truck Loading	Produced Water Loading	L-1	L-1	Uncontrolled loading; 558,751 bbl/yr of Produced Water loaded

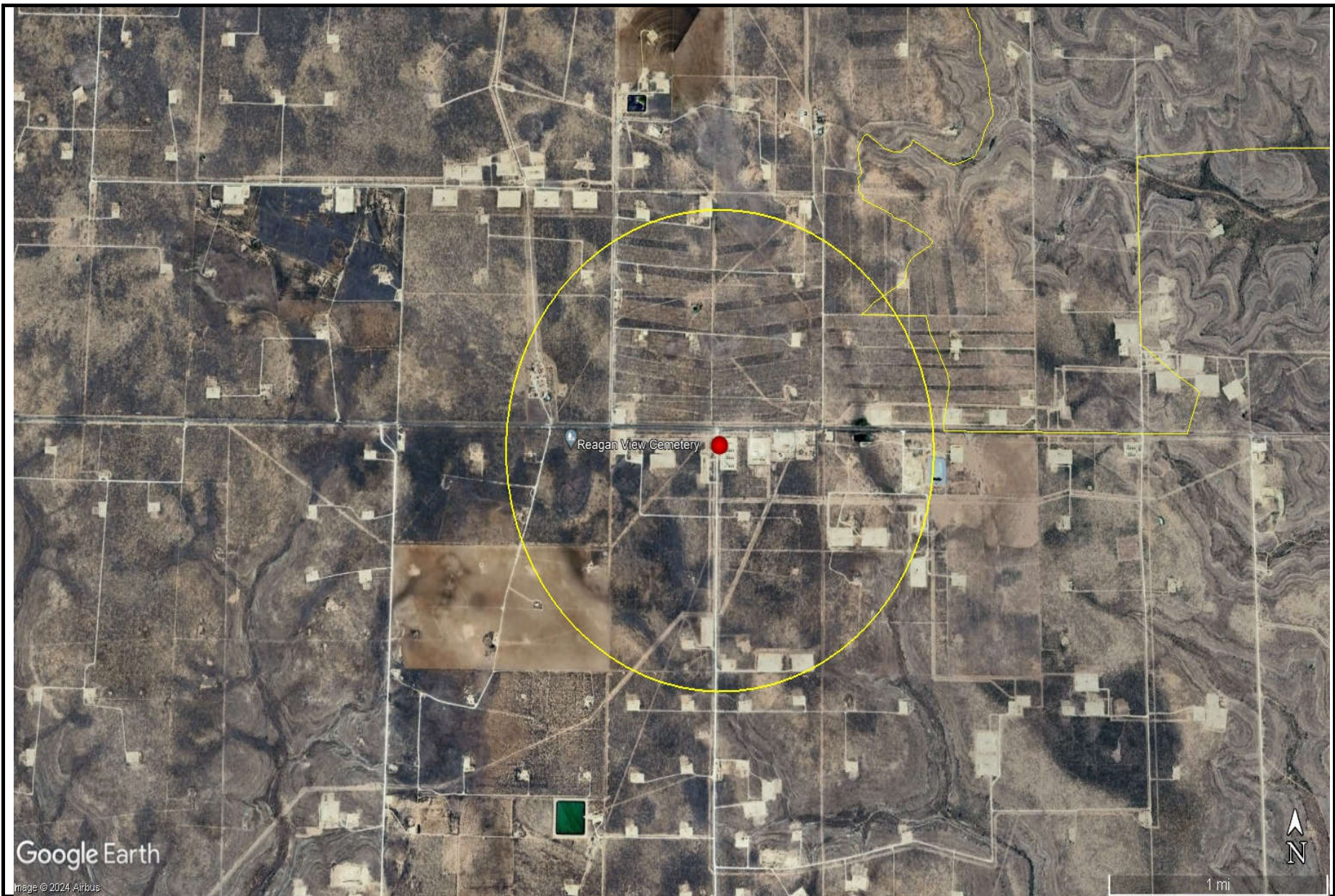
Charlie Brown Compressor Station
Targa Midstream Services LLC
TCEQ Oil and Gas Non-Rule Standard Permit
July 2024

Project Information

Section 1.1

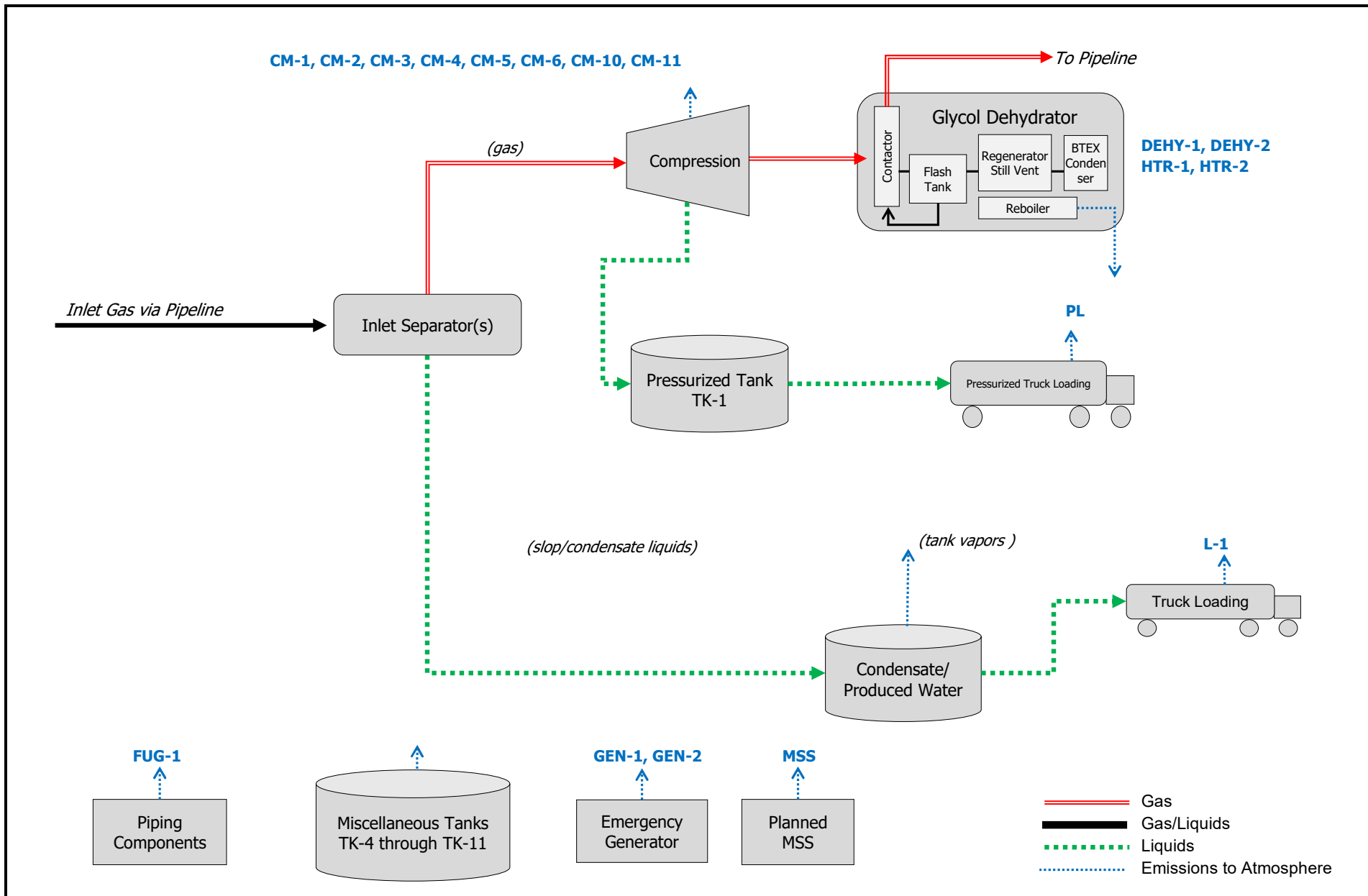
Site Operations, Equipment, and Emission Sources

Equipment/Activity Category	Source Name:	EPN(s):	FIN(s):	Description
Truck Loading	Pressurized Loading	PL	PL	Pressurized loading; 21 bbl/yr of HP-Condensate loaded
MSS	Compressor Blowdowns	MSS	BLDWN	3,932 scf/event/unit; 12 events/yr/unit
MSS	Piping from Skid to Comp BD	MSS	MSS	169 scf/event/unit; 1 event/yr/unit
MSS	Dehydrator Blowdowns	MSS	VSL-BD	48,180 scf/event/unit; 1 event/yr/unit
MSS	Pigging and Purging	MSS	PIG	2,364 scf/event; 52 events/yr
MSS	Tank Maintenance	MSS	TM	1,178 scf/event; 2 events/yr
MSS	Surface Coating & Blasting	SCAB	SCAB	Painting and abrasive blasting activities (PBR 106.263)
MSS	Miscellaneous MSS Activities	MSS	MSS-MISC	TCEQ miscellaneous MSS activities



Charlie Brown Compressor Station
Targa Midstream Services LLC
Reagan County (31.5492, -101.36836)

Section 1.2
AREA MAP



Charlie Brown Compressor Station
Targa Midstream Services LLC
July 2024

Section 1.3
PROCESS FLOW
DIAGRAM

Emission Summary

Section 1.4

EPN	FIN	Source Name	VOC		NO _x		CO		PM _{TOTAL/10/2.5}		PM		PM ₁₀		PM _{2.5}		SO ₂		H ₂ S		Benzene		HCHO		HAPs		Emission Type [1]	Annual Operation hr/yr	Natural Gas VOC lb/hr	Crude Oil/ Condensate VOC lb/hr
			lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy				
New or Revised Sources with this Revision Application																														
TK-2	TK-2	Condensate Tank	19.15	0.70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.01	<0.01	0.15	<0.01	--	--	1.12	0.03	S	8,760	--	19.15
TK-3	TK-3	Produced Water Tank	31.04	1.16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.01	<0.01	0.24	0.01	--	--	2.65	0.07	S	8,760	--	31.04
HTR-1	HTR-1	Glycol Heater	<0.01	0.01	0.05	0.21	0.04	0.18	<0.01	0.02	--	--	--	--	--	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	S	8,760	<0.01	--
HTR-2	HTR-2	Glycol Heater	<0.01	0.01	0.05	0.21	0.04	0.18	<0.01	0.02	--	--	--	--	--	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	S	8,760	<0.01	--
DEHY-1	DEHY-1	Glycol Heater/Glycol Dehy Unit 1	0.08	0.35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.01	<0.01	0.01	0.03	--	--	0.01	0.04	S	8,760	0.08	--
DEHY-2	DEHY-2	Glycol Heater/Glycol Dehy Unit 2	0.08	0.35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.01	<0.01	0.01	0.03	--	--	0.01	0.04	S	8,760	0.08	--
FUG-1	FUG-1	Piping Component Fugitives	1.31	5.73	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.01	<0.01	0.01	0.03	--	--	0.12	0.53	S	8,760	0.38	0.79
L-1	L-1	Condensate Loading	57.01	0.06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.02	<0.01	0.37	<0.01	--	--	2.78	<0.01	S	8,760	--	57.01
L-1	L-1	Produced Water Loading	53.43	1.23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.01	<0.01	0.31	0.01	--	--	3.27	0.08	S	8,760	--	53.43
PL	PL	Pressurized Loading	0.28	0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	--	--	0.01	<0.01	S	8,760	--	0.28
Sources Unchanged with this Revision Application																														
CM-1	CM-1	Caterpillar 3516J Compressor Engine	2.33	10.19	3.04	13.33	3.80	16.66	<0.01	0.02	<0.01	0.02	<0.01	0.02	<0.01	<0.01	0.01	0.03	--	--	<0.01	0.02	0.20	0.86	0.42	1.82	S	8,760	2.33	--
CM-2	CM-2	Caterpillar 3516J Compressor Engine	2.33	10.19	3.04	13.33	3.80	16.66	<0.01	0.02	<0.01	0.02	<0.01	0.02	<0.01	<0.01	0.01	0.03	--	--	<0.01	0.02	0.20	0.86	0.42	1.82	S	8,760	2.33	--
CM-3	CM-3	Caterpillar 3516J Compressor Engine	2.33	10.19	3.04	13.33	3.80	16.66	<0.01	0.02	<0.01	0.02	<0.01	0.02	<0.01	<0.01	0.01	0.03	--	--	<0.01	0.02	0.20	0.86	0.42	1.82	S	8,760	2.33	--
CM-4	CM-4	Caterpillar 3516J Compressor Engine	2.33	10.19	3.04	13.33	3.80	16.66	<0.01	0.02	<0.01	0.02	<0.01	0.02	<0.01	<0.01	0.01	0.03	--	--	<0.01	0.02	0.20	0.86	0.42	1.82	S	8,760	2.33	--
CM-5	CM-5	Caterpillar 3516J Compressor Engine	2.33	10.19	3.04	13.33	3.80	16.66	<0.01	0.02	<0.01	0.02	<0.01	0.02	<0.01	<0.01	0.01	0.03	--	--	<0.01	0.02	0.20	0.86	0.42	1.82	S	8,760	2.33	--
CM-6	CM-6	Caterpillar 3516J Compressor Engine	2.33	10.19	3.04	13.33	3.80	16.66	<0.01	0.02	<0.01	0.02	<0.01	0.02	<0.01	<0.01	0.01	0.03	--	--	<0.01	0.02	0.20	0.86	0.42	1.82	S	8,760	2.33	--
CM-10	CM-10	Caterpillar 3516J Compressor Engine	2.33	10.19	3.04	13.33	3.80	16.66	<0.01	0.02	<0.01	0.02	<0.01	0.02	<0.01	<0.01	0.01	0.03	--	--	<0.01	0.02	0.20	0.86	0.42	1.82	S	8,760	2.33	--
CM-11	CM-11	Caterpillar 3516 Compressor Engine	1.75	7.65	4.78	20.95	2.99	13.10	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.01	0.01	0.02	--	--	<0.01	0.02	0.06	0.28	0.24	1.05	S	8,760	1.75	--
GEN-1	GEN-1	PSI Industrial 8.8L	0.50	0.02	1.08	0.05	1.77	0.09	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--	--	<0.01	<0.01	0.01	<0.01	0.04	<0.01	S	100	0.50	--
GEN-2	GEN-2	PSI Industrial 8.8L	0.50	0.02	1.08	0.05	1.77	0.09	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--	--	<0.01	<0.01	0.01	<0.01	0.04	<0.01	S	100	0.50	--
TK-4	TK-4	Methanol Tank	0.82	0.03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.01	<0.01	S	8,760	--	<0.01
TK-5	TK-5	Lube Oil Tank	<0.01	<0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.01	<0.01	S	8,760	--	<0.01
TK-6	TK-6	Antifreeze Tank	<0.01	<0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.01	<0.01	S	8,760	--	<0.01
TK-7	TK-7	Triethylene Glycol Tank	<0.01	<0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.01	<0.01	S	8,760	--	<0.01
TK-8	TK-8	Methanol Tank	0.82	0.03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.01	<0.01	S	8,760	--	<0.01
TK-9	TK-9	Lube Oil Tank	<0.01	<0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.01	<0.01	S	8,760	--	<0.01
TK-10	TK-10	Antifreeze Tank	<0.01	<0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.01	<0.01	S	8,760	--	<0.01
TK-11	TK-11	Triethylene Glycol Tank	<0.01	<0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.01	<0.01	S	8,760	--	<0.01
TOTAL EMISSIONS			1,213.09	93.69	28.34	114.77	33.24	130.23	0.17	0.16	0.03	0.12	0.16	0.13	0.04	0.02	0.05	0.23	0.09	<0.01	3.35	0.28	1.46	6.30	41.24	14.75			765.11	110.16

Emission Summary - Emission Limit Review

Section 1.5

EMISSIONS TYPE	VOC	NO _x	CO	PM	PM ₁₀	PM _{2.5}	SO ₂	H ₂ S	Benzene	HCHO	HAPs	Annual Operation
STEADY-STATE HOURLY EMISSIONS	183.03 lb/hr	28.34 lb/hr	33.24 lb/hr	0.03 lb/hr	0.03 lb/hr	0.02 lb/hr	0.05 lb/hr	0.03 lb/hr	1.13 lb/hr	1.46 lb/hr	13.20 lb/hr	
STEADY-STATE HOURLY EMISSION LIMITS		121.0 lb/hr	104.0 lb/hr	28.0 lb/hr	28.0 lb/hr	28.0 lb/hr	93.2 lb/hr	10.8 lb/hr	7.0 lb/hr			
LOW-PRESSURE PERIODIC EMISSIONS	21.41 lb/hr						--	<0.01 lb/hr	0.05 lb/hr			212 hr/yr
LOW-PRESSURE PERIODIC EMISSION LIMITS							93.2 lb/hr	10.8 lb/hr	7.0 lb/hr			8,760 hr/yr
HIGH-PRESSURE PERIODIC EMISSIONS	1,008.64 lb/hr							0.06 lb/hr	2.16 lb/hr			534 hr/yr
HIGH-PRESSURE PERIODIC EMISSION LIMITS								9.8 lb/hr	15.4 lb/hr			600 hr/yr
TOTAL ANNUAL EMISSIONS	93.69 tpy	114.77 tpy	130.23 tpy	0.12 tpy	0.13 tpy	0.02 tpy	0.23 tpy	<0.01 tpy	0.28 tpy	6.30 tpy	14.75 tpy	
TOTAL ANNUAL EMISSION LIMITS	250 tpy	250 tpy	250 tpy	15 tpy	15 tpy	15 tpy	250 tpy	47 tpy	10 tpy	no limit	no limit	

FEDERAL EMISSION THRESHOLDS	VOC	NO _x	CO	PM	PM ₁₀	PM _{2.5}	SO ₂	H ₂ S	Benzene	HCHO	HAPs
TOTAL EMISSIONS MINUS FUGITIVES [1]	93.69 tpy	114.77 tpy	130.23 tpy	0.12 tpy	0.13 tpy	0.02 tpy	0.23 tpy	<0.01 tpy	0.28 tpy	6.30 tpy	14.75 tpy
Title V Major Source Thresholds	100 tpy	100 tpy	100 tpy	100 tpy	100 tpy	100 tpy	100 tpy	100 tpy	10 tpy	10 tpy	25 tpy
Less than Threshold?	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PSD Major Source Thresholds	250 tpy	250 tpy	250 tpy	250 tpy	250 tpy	250 tpy	250 tpy	250 tpy			
Less than Threshold?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			

[1] Because this site is not a named source, fugitive emissions are not considered in federal major source threshold comparisons.

Lab Analyses & Compositions

Charlie Brown Compressor Station
Targa Midstream Services LLC
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Inlet Gas Composition

Section 2.1

Gas Sample Information		
Site	Charlie Brown	
Gas Sample Type	Site-specific Sample	
Date Sampled	7/8/2024	
Point in Process	Inlet Gas	
Temperature (°F) / Pressure (psig)	78 °F	51 psig
Enter H ₂ S ppmv to Overwrite Analysis Mole%	10 ppmv	

Component	Molecular Weight lb/lb-mole	Mole %	Weight %	Heating Values	
				Net/LHV Btu/scf	Gross/HHV Btu/scf
H ₂ S	34.08	0.0010%	0.0000157*	586.8	637.02
Nitrogen	28.01	1.8080%	2.3237%	--	--
Carbon Dioxide	44.01	0.8650%	1.7465%	--	--
Methane (C1)	16.04	76.5000%	56.3072%	909.4	1,009.7
Ethane (C2)	30.07	10.5310%	14.5285%	1,618.7	1,768.7
Propane (C3)	44.10	6.5830%	13.3192%	2,314.9	2,517.2
Isobutane (i-C4)	58.12	0.4850%	1.2933%	3,000.4	3,256.6
n-Butane (n-C4)	58.12	1.8000%	4.7997%	3,010.8	3,262.0
Isopentane (i-C5)	72.15	0.3390%	1.1222%	3,699.0	3,999.7
n-Pentane (n-C5)	72.15	0.3970%	1.3141%	3,703.9	4,000.7
Other Hexanes (C6)	104.62	0.1690%	0.8111%	4,395.14	4,747.3
Heptanes (C7)	100.20	0.2370%	1.0895%	5,100.3	5,502.5
Octanes (C8)	114.23	0.1010%	0.5293%	5,796.2	6,248.9
Nonanes (C9)	128.25	0.0180%	0.1059%	6,493.6	6,996.5
Decanes Plus (C10+)	142.28	0.0040%	0.0261%	7,189.9	7,742.9
Benzene	78.11	0.0150%	0.0538%	3,590.9	3,741.9
Toluene	92.14	0.0090%	0.0380%	4,273.6	4,474.8
Ethylbenzene	106.16	0.0020%	0.0097%	4,970.5	5,222.1
Xylenes	106.17	0.0030%	0.0146%	4,958.2	5,208.7
n-Hexane	86.18	0.1060%	0.4191%	4,395.14	4,756.1
2,2,4-Trimethylpentane	114.23	0.0280%	0.1467%	5,778.9	6,231.7
Totals:	21.73	100.00%	100.00%	1,244.0	1,266.1

*Note: Due to the natural variation of H₂S in gas, the H₂S weight% has been adjusted to reflect the above H₂S concentration of up to 10 ppmv which is used in the emission calculations.

Other Sample Properties	Value	Unit
TOC	95.9282%	Weight %
VOC	25.0925%	Weight %
HAPs	0.6820%	Weight %

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Hydrocarbon Liquid Composition

Section 2.2

Liquid Sample Information		
Site	Charlie Brown	
Liquid Sample Type	Site-specific Sample	
Date Sampled	6/25/2024	
Point in Process	Hydrocarbon Liquid	
Temperature (°F) / Pressure (psig)	NR	NR
Enter H ₂ S ppmv to Overwrite Analysis Mole%	10 ppmv	

Component	Molecular Weight lb/lb-mole	Mole %	Weight %
H ₂ S	34.08	0.0010%	0.0000034*
Nitrogen	28.01	--	--
Carbon Dioxide	44.01	0.0140%	0.0062%
Methane (C1)	16.04	0.1130%	0.0183%
Ethane (C2)	30.07	0.3000%	0.0913%
Propane (C3)	44.10	1.6020%	0.7151%
Isobutane (i-C4)	58.12	0.5940%	0.3495%
n-Butane (n-C4)	58.12	4.2330%	2.4903%
Isopentane (i-C5)	72.15	3.7430%	2.7336%
n-Pentane (n-C5)	72.15	6.4990%	4.7464%
Other Hexanes (C6)	86.18	6.3220%	5.5149%
Heptanes (C7)	100.20	22.8530%	23.1786%
Octanes (C8)	114.23	22.3550%	25.8483%
Nonanes (C9)	128.26	9.6020%	12.4661%
Decanes Plus (C10+)	103.54	7.1210%	7.4630%
Benzene	78.11	1.0230%	0.8088%
Toluene	92.14	1.9050%	1.7767%
Ethylbenzene	106.17	0.8800%	0.9457%
Xylenes	106.17	1.8700%	2.0097%
n-Hexane	86.18	5.4090%	4.7185%
2,2,4-Trimethylpentane	114.23	3.5620%	4.1186%
Totals:	98.79	100.00%	100.00%

**Note: Due to the natural variation of H₂S in crude oil/condensate, the H₂S mol% has been adjusted to reflect a conservative H₂S concentration of up to 10 ppmv which is used in the emission calculations.

Other Sample Properties	Value	Unit
C10+ Molecular Weight	103.537	lb/lb-mole
C10+ Specific Gravity	0.7	dimensionless
TOC	99.9934%	Weight %
VOC	99.8838%	Weight %
HAPs	14.3780%	Weight %

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ProMax Modeled Composition - Condensate Vapor

Section 2.3

Gas Composition Information	
Source of Composition	ProMax Modeled Process Stream
Modeled Composition Based on:	Site-specific Sample
Process Stream from ProMax Report	Total Uncontrolled Emissions

Component	Molecular Weight lb/lb-mole	Mole %	Weight %	Heating Values	
				Net/LHV Btu/scf	Gross/HHV Btu/scf
H ₂ S	34.08	0.0458%	0.0292%	586.8	637.02
Nitrogen	28.01	--	--	--	--
Carbon Dioxide	44.01	0.6407%	0.5288%	--	--
Methane (C1)	16.04	5.1711%	1.5558%	909.4	1,009.7
Ethane (C2)	30.07	13.7285%	7.7417%	1,618.7	1,768.7
Propane (C3)	44.10	30.4322%	25.1681%	2,314.9	2,517.2
Isobutane (i-C4)	58.12	4.4378%	4.8369%	3,000.4	3,256.6
n-Butane (n-C4)	58.12	21.1860%	23.0915%	3,010.8	3,262.0
Isopentane (i-C5)	72.15	6.9126%	9.3532%	3,699.0	3,999.7
n-Pentane (n-C5)	72.15	8.8854%	12.0224%	3,703.9	4,000.7
Other Hexanes (C6)	86.18	0.8259%	1.3347%	4,395.14	4,747.3
Heptanes (C7)	100.20	3.1630%	5.9435%	5,100.3	5,502.5
Octanes (C8)	114.23	1.6952%	3.6315%	5,796.2	6,248.9
Nonanes (C9)	128.25	0.1269%	0.3052%	6,493.6	6,996.5
Decanes Plus (C10+)	142.28	0.0225%	0.0599%	7,189.9	7,742.9
Benzene	78.11	0.4025%	0.5895%	3,590.9	3,741.9
Toluene	92.14	0.1985%	0.3429%	4,273.6	4,474.8
Ethylbenzene	106.16	0.0275%	0.0547%	4,970.5	5,222.1
Xylenes	106.17	0.0518%	0.1032%	4,958.2	5,208.7
n-Hexane	86.18	2.0463%	3.3072%	4,395.14	4,756.1
2,2,4-Trimethylpentane	114.23	--	--	5,778.9	6,231.7
Totals:	52.93	100.00%	100.00%	2,730.35	2,984.13

Other Sample Properties	Value	Unit
Molecular Weight	52.93	lb/lb-mole
Net / Low Heat Value (LHV)	2,730.4	Btu/scf
TOC	99.4420%	Weight %
VOC	90.1445%	Weight %
HAPs	4.3975%	Weight %

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ProMax Modeled Composition - Slop Vapor

Section 2.4

Gas Composition Information	
Source of Composition	ProMax Modeled Process Stream
Modeled Composition Based on:	Representative Sample
Process Stream from ProMax Report	Standing

Component	Molecular Weight lb/lb-mole	Mole %	Weight %	Heating Values	
				Net/LHV Btu/scf	Gross/HHV Btu/scf
H ₂ S	34.08	0.0028%	0.0016%	586.8	637.02
Nitrogen	28.01	--	--	--	--
Carbon Dioxide	44.01	0.1114%	0.0840%	--	--
Methane (C1)	16.04	0.8994%	0.2472%	909.4	1,009.7
Ethane (C2)	30.07	2.3877%	1.2302%	1,618.7	1,768.7
Propane (C3)	44.10	12.7502%	9.6341%	2,314.9	2,517.2
Isobutane (i-C4)	58.12	4.7276%	4.7078%	3,000.4	3,256.6
n-Butane (n-C4)	58.12	32.2487%	32.1138%	3,010.8	3,262.0
Isopentane (i-C5)	72.15	10.8422%	13.4032%	3,699.0	3,999.7
n-Pentane (n-C5)	72.15	15.3349%	18.9570%	3,703.9	4,000.7
Other Hexanes (C6)	86.18	1.5948%	2.3549%	4,395.14	4,747.3
Heptanes (C7)	100.20	4.9002%	8.4126%	5,100.3	5,502.5
Octanes (C8)	114.23	1.1773%	2.3042%	5,796.2	6,248.9
Nonanes (C9)	128.25	0.2003%	0.4400%	6,493.6	6,996.5
Decanes Plus (C10+)	142.28	0.0354%	0.0862%	7,189.9	7,742.9
Benzene	78.11	0.4220%	0.5647%	3,590.9	3,741.9
Toluene	92.14	0.2857%	0.4510%	4,273.6	4,474.8
Ethylbenzene	106.16	0.0424%	0.0771%	4,970.5	5,222.1
Xylenes	106.17	0.0804%	0.1463%	4,958.2	5,208.7
n-Hexane	86.18	3.2399%	4.7840%	4,395.14	4,756.1
2,2,4-Trimethylpentane	114.23	--	--	5,778.9	6,231.7
Totals:	59.94	91.28%	100.00%	2,999.48	3,250.08

Other Sample Properties	Value	Unit
Molecular Weight	59.94	lb/lb-mole
Net / Low Heat Value (LHV)	2,999.5	Btu/scf
TOC	99.9144%	Weight %
VOC	98.4370%	Weight %
HAPs	6.0231%	Weight %

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Residue Gas Composition

Section 2.5

Gas Sample Information		
Site	Charlie Brown	
Gas Sample Type	Site-specific Sample	
Date Sampled	7/8/2024	
Point in Process	Residue Gas	
Temperature (°F) / Pressure (psig)	78 °F	51 psig
Enter H ₂ S ppmv to Overwrite Analysis Mole%	10 ppmv	

Component	Molecular Weight lb/lb-mole	Mole %	Weight %	Heating Values	
				Net/LHV Btu/scf	Gross/HHV Btu/scf
H ₂ S	34.08	0.0002%	0.0000723*	586.8	637.02
Nitrogen	28.01	1.5968%	2.1157%	--	--
Carbon Dioxide	44.01	0.8028%	1.6711%	--	--
Methane (C1)	16.04	78.1792%	59.3223%	909.4	1,009.7
Ethane (C2)	30.07	10.2673%	14.6026%	1,618.7	1,768.7
Propane (C3)	44.10	6.1344%	12.7953%	2,314.9	2,517.2
Isobutane (i-C4)	58.12	0.4513%	1.2407%	3,000.4	3,256.6
n-Butane (n-C4)	58.12	1.5907%	4.3728%	3,010.8	3,262.0
Isopentane (i-C5)	72.15	0.2770%	0.9454%	3,699.0	3,999.7
n-Pentane (n-C5)	72.15	0.3462%	1.1813%	3,703.9	4,000.7
Other Hexanes (C6)	104.62	0.3542%	1.7525%	4,395.14	4,747.3
Totals:	4.71	100.00%	100.01%	1,119.23	1,233.72

*Note: Due to the natural variation of H₂S in gas, the H₂S weight% has been adjusted to reflect the above H₂S concentration of up to 10 ppmv which is used in the emission calculations.

Other Sample Properties	Value	Unit
TOC	96.2129%	Weight %
VOC	22.2880%	Weight %
HAPs	0.0000%	Weight %

Compressor Engine

Section 3.0

EPN(s): CM-1, CM-2, CM-3, CM-4, CM-5, CM-6, CM-10

FIN(s): CM-1, CM-2, CM-3, CM-4, CM-5, CM-6, CM-10

Source Name: Caterpillar 3516J Compressor Engine

Total Emissions:

Pollutant	lb/hr	tpy	lb/hr/engine	tpy/engine
VOC	16.28	71.30	2.33	10.19
NOx	21.30	93.28	3.04	13.33
CO	26.62	116.60	3.80	16.66
PM _{TOTAL/10/2.5}	0.02	0.11	3.45E-03	0.02
PM	0.02	0.11	3.45E-03	0.02
PM ₁₀	0.02	0.11	3.45E-03	0.02
PM _{2.5}	3.90E-03	0.02	3.45E-03	2.44E-03
SO ₂	0.05	0.20	0.01	0.03
HCHO	1.37	6.02	0.20	0.86
Benzene	0.03	0.15	5.00E-03	0.02
HAPs	2.91	12.75	0.42	1.82

Calculation Basis:

Emissions from the natural gas-fired internal combustion engines, including NO_x, CO, VOC, SO₂, PM, HCHO, and HAP, are calculated according to fuel type, engine type, and emission factors as indicated in the below emission calculations.

PM emissions, including filterable and condensable PM₁₀ and PM_{2.5}, are calculated using updated emission factors developed by EPA and documented in EPA's "NG_process_gas_LPG_PM_factors" spreadsheet (Revision date March 2012; https://www.epa.gov/sites/default/files/2018-11/natgas_procgas_lpg_pm_efs_not_ap42_032012_revisions.xlsx).

Fuel heat content is based on the site-specific sample taken from Charlie Brown - Residue Gas (sampled on 07/08/2024).

No control efficiency is applied to the HAP emissions. Represented HAP emissions are worst-case uncontrolled.

Background Information:

Engine Data

Engine Manufacturer	Caterpillar
Engine Model	3516J
Engine Manufacture Date	After 7/1/2010
Engine Construction Date	TBD
Number of Engines	7
Engine Serial Numbers	
Engine Application	Gas Compression
Engine Type	4 Stroke, Lean Burn
Method of Emission Control	Oxidation Catalyst
Horsepower	1,380 hp
Fuel Consumption Rate	8,233 Btu/hp-hr
Annual Operation	8,760 hr/yr

Stack Parameters

Stack Height	≥ 25.0 ft
Stack Diameter	1.00 ft
Stack Temperature	832 °F
Stack Flow	5,276 cfm
	111.96 fps

Federal/State Standards Applicability

NSPS JJJJ	Yes	Non-certified
MACT ZZZZ	Yes	Remote
30 TAC 117	No	

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Compressor Engine

Section 3.0

EPN(s): CM-1, CM-2, CM-3, CM-4, CM-5, CM-6, CM-10

FIN(s): CM-1, CM-2, CM-3, CM-4, CM-5, CM-6, CM-10

Source Name: Caterpillar 3516J Compressor Engine

Fuel Data

Basis for Fuel Heat Content		Charlie Brown - Residue Gas
Fuel type		Field Gas
Heat Content	(LHV)	1,119 Btu/scf
	(HHV)	1,234 Btu/scf

Optional Engine Data

No. of Cylinders	16
Compression Ratio	8 : 1

Emission Factors (EF)

Pollutant	Unit	Pre-control	Claimed Control Efficiency	Post-control	Source of EF Data
NOx	g/hp-hr	1.00	0%	1.00	Vendor Data
CO	g/hp-hr	2.65	53%	1.25	Vendor Data
VOC	g/hp-hr	0.91	16%	0.76	Vendor Data
HCHO	g/hp-hr	0.43	85%	0.06	Vendor Data

Does VOC EF include formaldehyde (HCHO)?	Yes
Does VOC EF include acetaldehyde/acrolein (aldehydes)?	Yes
Apply HCHO % Reduction efficiency to aldehydes ?	No

Emission Calculations:

Pollutants	Emission Factor (EF)	Units	Source of Emission Factor	Engine Emissions	
				lb/hr	tpy
VOC (with Aldehydes)	0.7644	g/hp-hr	Vendor Data	2.33	10.19
NO _x	1	g/hp-hr	Vendor Data	3.04	13.33
CO	1.250005	g/hp-hr	Vendor Data	3.80	16.66
PM (condensable)	0.0001373	lb/MMBtu	AP-42, Table 3.2-2	1.56E-03	0.01
PM ₁₀ (filterable)	0.0001667	lb/MMBtu	AP-42, Table 3.2-2	1.89E-03	0.01
PM _{2.5} (filterable)	0.000049	lb/MMBtu	AP-42, Table 3.2-2	5.57E-04	2.44E-03
PM _{TOTAL/10/2.5}	0.0003039	lb/MMBtu	AP-42, Table 3.2-2	3.45E-03	0.02
SO ₂	0.000588	lb/MMBtu	AP-42, Table 3.2-2	0.01	0.03
TOTAL HAP	--	--	See Speciated HAP	0.42	1.82

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Compressor Engine

Section 3.0

EPN(s): CM-1, CM-2, CM-3, CM-4, CM-5, CM-6, CM-10

FIN(s): CM-1, CM-2, CM-3, CM-4, CM-5, CM-6, CM-10

Source Name: Caterpillar 3516J Compressor Engine

Emission Calculations - Speciated HAP:

Pollutants	Emission Factor (EF)	Units	Source of Emission Factor	Engine Emissions	
				lb/hr	tpy
1,1,2,2-Tetrachloroethane	0.00004	lb/MMBtu	AP-42, Table 3.2-2	4.54E-04	1.99E-03
1,1,2-Trichloroethane	0.0000318	lb/MMBtu	AP-42, Table 3.2-2	3.61E-04	1.58E-03
1,3-Butadiene	0.000267	lb/MMBtu	AP-42, Table 3.2-2	3.03E-03	0.01
1,3-Dichloropropene	0.0000264	lb/MMBtu	AP-42, Table 3.2-2	3.00E-04	1.31E-03
2,2,4-Trimethylpentane	0.00025	lb/MMBtu	AP-42, Table 3.2-2	2.84E-03	0.01
Acetaldehyde	0.00836	lb/MMBtu	AP-42, Table 3.2-2	0.09	0.42
Acrolein	0.00514	lb/MMBtu	AP-42, Table 3.2-2	0.06	0.26
Benzene	0.00044	lb/MMBtu	AP-42, Table 3.2-2	5.00E-03	0.02
Biphenyl	0.000212	lb/MMBtu	AP-42, Table 3.2-2	2.41E-03	0.01
Carbon Tetrachloride	0.0000367	lb/MMBtu	AP-42, Table 3.2-2	4.17E-04	1.83E-03
Chlorobenzene	0.0000304	lb/MMBtu	AP-42, Table 3.2-2	3.45E-04	1.51E-03
Chloroform	0.0000285	lb/MMBtu	AP-42, Table 3.2-2	3.24E-04	1.42E-03
Ethylbenzene	0.0000397	lb/MMBtu	AP-42, Table 3.2-2	4.51E-04	1.98E-03
Ethylene Dibromide	0.0000443	lb/MMBtu	AP-42, Table 3.2-2	5.03E-04	2.20E-03
Formaldehyde (HCHO)	0.0645	g/hp-hr	Vendor Data	0.20	0.86
Methanol	0.0025	lb/MMBtu	AP-42, Table 3.2-2	0.03	0.12
Methylene Chloride	0.00002	lb/MMBtu	AP-42, Table 3.2-2	2.27E-04	9.95E-04
n-Hexane	0.00111	lb/MMBtu	AP-42, Table 3.2-2	0.01	0.06
Naphthalene	0.0000744	lb/MMBtu	AP-42, Table 3.2-2	8.45E-04	3.70E-03
PAH	0.0000269	lb/MMBtu	AP-42, Table 3.2-2	3.06E-04	1.34E-03
Phenol	0.000024	lb/MMBtu	AP-42, Table 3.2-2	2.73E-04	1.19E-03
Styrene	0.0000236	lb/MMBtu	AP-42, Table 3.2-2	2.68E-04	1.17E-03
Tetrachloroethane	0.0000025	lb/MMBtu	AP-42, Table 3.2-2	2.82E-05	1.23E-04
Toluene	0.000408	lb/MMBtu	AP-42, Table 3.2-2	4.64E-03	0.02
Vinyl Chloride	0.0000149	lb/MMBtu	AP-42, Table 3.2-2	1.69E-04	7.41E-04
Xylenes	0.000184	lb/MMBtu	AP-42, Table 3.2-2	2.09E-03	0.01

Equations used:

- Pollutant Emissions, lb/hr = (Pollutant EF, g/hp-hr) x (Engine Horsepower, hp) / (453.5924 g/lb)
- Pollutant Emissions, lb/hr = (Pollutant EF, lb/MMBtu) x (Engine Horsepower, hp) x (Fuel Consumption, Btu/hp-hr) / (10⁶)
- Pollutant Emissions, tpy = (Pollutant Emissions, lb/hr) x (Annual Operation, hr/yr) / (2,000 lb/ton)

Compressor Engine

Section 3.0

EPN(s): CM-11
FIN(s): CM-11
Source Name: Caterpillar 3516 Compressor Engine

Total Emissions:

Pollutant	lb/hr	tpy
VOC	1.75	7.65
NOx	4.78	20.95
CO	2.99	13.10
PM _{TOTAL/10/2.5}	2.74E-03	0.01
PM	2.74E-03	0.01
PM ₁₀	2.74E-03	0.01
PM _{2.5}	4.43E-04	1.94E-03
SO ₂	0.01	0.02
HCHO	0.06	0.28
Benzene	3.97E-03	0.02
HAPs	0.24	1.05

Calculation Basis:

Emissions from the natural gas-fired internal combustion engines, including NO_x, CO, VOC, SO₂, PM, HCHO, and HAP, are calculated according to fuel type, engine type, and emission factors as indicated in the below emission calculations.

PM emissions, including filterable and condensable PM₁₀ and PM_{2.5}, are calculated using updated emission factors developed by EPA and documented in EPA's "NG_process_gas_LPG_PM_factors" spreadsheet (Revision date March 2012; https://www.epa.gov/sites/default/files/2018-11/natgas_procgas_lpg_pm_efs_not_ap42_032012_revisions.xlsx).

Fuel heat content is based on the site-specific sample taken from Charlie Brown - Residue Gas (sampled on 07/08/2024).

No control efficiency is applied to the HAP emissions. Represented HAP emissions are worst-case uncontrolled.

Background Information:

Engine Data

Engine Manufacturer	Caterpillar	
Engine Model	3516	
Engine Manufacture Date	On 1/31/2006	
Engine Construction Date	N/A	
Number of Engines	1	
Engine Serial Number	4EK04917	
Engine Application	Gas Compression	
Engine Type	4 Stroke, Lean Burn	
Method of Emission Control	Oxidation Catalyst	
Horsepower	1,085	hp
Fuel Consumption Rate	8,321	Btu/hp-hr
Annual Operation	8,760	hr/yr

Stack Parameters

Stack Height	≥ 25.0	ft
Stack Diameter	1.00	ft
Stack Temperature	863	°F
Stack Flow	4,293	cfm
	91.10	fps

Federal/State Standards Applicability

NSPS JJJJ	Yes	Non-certified
MACT ZZZZ	Yes	Remote
30 TAC 117	No	

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Compressor Engine

Section 3.0

EPN(s): CM-11
FIN(s): CM-11
Source Name: Caterpillar 3516 Compressor Engine

Fuel Data			Optional Engine Data	
Basis for Fuel Heat Content		Charlie Brown - Residue Gas		
Fuel type		Field Gas		
Heat Content	(LHV)	1,119 Btu/scf		
	(HHV)	1,234 Btu/scf		

No. of Cylinders	16
Compression Ratio	8 : 1

Emission Factors (EF)

Pollutant	Unit	Pre-control	Claimed Control Efficiency	Post-control	Source of EF Data
NOx	g/hp-hr	2.00	0%	2.00	Vendor Data
CO	g/hp-hr	2.16	42%	1.25	Vendor Data
VOC	g/hp-hr	0.73	0%	0.73	Vendor Data
HCHO	g/hp-hr	0.27	90%	0.03	Vendor Data

Does VOC EF include formaldehyde (HCHO)?	Yes
Does VOC EF include acetaldehyde/acrolein (aldehydes)?	Yes
Apply HCHO % Reduction efficiency to aldehydes ?	No

Emission Calculations:

Pollutants	Emission Factor (EF)	Units	Source of Emission Factor	Engine Emissions	
				lb/hr	tpy
VOC (with Aldehydes)	0.73	g/hp-hr	Vendor Data	1.75	7.65
NO _x	2	g/hp-hr	Vendor Data	4.78	20.95
CO	1.249992	g/hp-hr	Vendor Data	2.99	13.10
PM (condensable)	0.0001373	lb/MMBtu	AP-42, Table 3.2-2	1.24E-03	0.01
PM ₁₀ (filterable)	0.0001667	lb/MMBtu	AP-42, Table 3.2-2	1.50E-03	0.01
PM _{2.5} (filterable)	0.000049	lb/MMBtu	AP-42, Table 3.2-2	4.43E-04	1.94E-03
PM _{TOTAL/10/2.5}	0.0003039	lb/MMBtu	AP-42, Table 3.2-2	2.74E-03	0.01
SO ₂	0.000588	lb/MMBtu	AP-42, Table 3.2-2	0.01	0.02
TOTAL HAP	--	--	See Speciated HAP	0.24	1.05

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Compressor Engine

Section 3.0

EPN(s): CM-11

FIN(s): CM-11

Source Name: Caterpillar 3516 Compressor Engine

Emission Calculations - Speciated HAP:

Pollutants	Emission Factor (EF)	Units	Source of Emission Factor	Engine Emissions	
				lb/hr	tpy
1,1,2,2-Tetrachloroethane	0.00004	lb/MMBtu	AP-42, Table 3.2-2	3.61E-04	1.58E-03
1,1,2-Trichloroethane	0.0000318	lb/MMBtu	AP-42, Table 3.2-2	2.87E-04	1.26E-03
1,3-Butadiene	0.000267	lb/MMBtu	AP-42, Table 3.2-2	2.41E-03	0.01
1,3-Dichloropropene	0.0000264	lb/MMBtu	AP-42, Table 3.2-2	2.38E-04	1.04E-03
2,2,4-Trimethylpentane	0.00025	lb/MMBtu	AP-42, Table 3.2-2	2.26E-03	0.01
Acetaldehyde	0.00836	lb/MMBtu	AP-42, Table 3.2-2	0.08	0.33
Acrolein	0.00514	lb/MMBtu	AP-42, Table 3.2-2	0.05	0.20
Benzene	0.00044	lb/MMBtu	AP-42, Table 3.2-2	3.97E-03	0.02
Biphenyl	0.000212	lb/MMBtu	AP-42, Table 3.2-2	1.91E-03	0.01
Carbon Tetrachloride	0.0000367	lb/MMBtu	AP-42, Table 3.2-2	3.31E-04	1.45E-03
Chlorobenzene	0.0000304	lb/MMBtu	AP-42, Table 3.2-2	2.74E-04	1.20E-03
Chloroform	0.0000285	lb/MMBtu	AP-42, Table 3.2-2	2.57E-04	1.13E-03
Ethylbenzene	0.0000397	lb/MMBtu	AP-42, Table 3.2-2	3.58E-04	1.57E-03
Ethylene Dibromide	0.0000443	lb/MMBtu	AP-42, Table 3.2-2	4.00E-04	1.75E-03
Formaldehyde (HCHO)	0.027	g/hp-hr	Vendor Data	0.06	0.28
Methanol	0.0025	lb/MMBtu	AP-42, Table 3.2-2	0.02	0.10
Methylene Chloride	0.00002	lb/MMBtu	AP-42, Table 3.2-2	1.81E-04	7.91E-04
n-Hexane	0.00111	lb/MMBtu	AP-42, Table 3.2-2	0.01	0.04
Naphthalene	0.0000744	lb/MMBtu	AP-42, Table 3.2-2	6.72E-04	2.94E-03
PAH	0.0000269	lb/MMBtu	AP-42, Table 3.2-2	2.43E-04	1.06E-03
Phenol	0.000024	lb/MMBtu	AP-42, Table 3.2-2	2.17E-04	9.49E-04
Styrene	0.0000236	lb/MMBtu	AP-42, Table 3.2-2	2.13E-04	9.33E-04
Tetrachloroethane	0.0000025	lb/MMBtu	AP-42, Table 3.2-2	2.24E-05	9.81E-05
Toluene	0.000408	lb/MMBtu	AP-42, Table 3.2-2	3.68E-03	0.02
Vinyl Chloride	0.0000149	lb/MMBtu	AP-42, Table 3.2-2	1.35E-04	5.89E-04
Xylenes	0.000184	lb/MMBtu	AP-42, Table 3.2-2	1.66E-03	0.01

Equations used:

- Pollutant Emissions, lb/hr = (Pollutant EF, g/hp-hr) x (Engine Horsepower, hp) / (453.5924 g/lb)
- Pollutant Emissions, lb/hr = (Pollutant EF, lb/MMBtu) x (Engine Horsepower, hp) x (Fuel Consumption, Btu/hp-hr) / (10⁶)
- Pollutant Emissions, tpy = (Pollutant Emissions, lb/hr) x (Annual Operation, hr/yr) / (2,000 lb/ton)

Compressor Engine

Section 3.0

EPN(s): GEN-1, GEN-2

FIN(s): GEN-1, GEN-2

Source Name: Emergency Engine (PSI Industrial 8.8L)

Total Emissions:

Pollutant	lb/hr	tpy	lb/hr/engine	tpy/engine
VOC	0.99	0.05	0.50	0.02
NOx	2.16	0.11	1.08	0.05
CO	3.54	0.18	1.77	0.09
PM _{TOTAL/10/2.5}	1.27E-03	6.33E-05	6.33E-04	3.16E-05
PM	1.27E-03	6.33E-05	6.33E-04	3.16E-05
PM ₁₀	1.27E-03	6.33E-05	6.33E-04	3.16E-05
PM _{2.5}	2.04E-04	1.02E-05	1.02E-04	5.10E-06
SO ₂	2.45E-03	1.22E-04	1.22E-03	6.12E-05
HCHO	0.02	1.08E-03	0.01	5.40E-04
Benzene	0.01	3.29E-04	3.29E-03	1.65E-04
HAPs	0.07	3.56E-03	0.04	1.78E-03

Calculation Basis:

Emissions from the natural gas-fired internal combustion engines, including NO_x, CO, VOC, SO₂, PM, HCHO, and HAP, are calculated according to fuel type, engine type, and emission factors as indicated in the below emission calculations.

PM emissions, including filterable and condensable PM₁₀ and PM_{2.5}, are calculated using updated emission factors developed by EPA and documented in EPA's "NG_process_gas_LPG_PM_factors" spreadsheet (Revision date March 2012; https://www.epa.gov/sites/default/files/2018-11/natgas_procgas_lpg_pm_efs_not_ap42_032012_revisions.xlsx).

Fuel heat content is based on the site-specific sample taken from Charlie Brown - Residue Gas (sampled on 07/08/2024).

Background Information:

Engine Data

Engine Manufacturer	PSI Industrial	
Engine Model	8.8L	
Engine Manufacture Date	After 1/1/2009	
Engine Construction Date	TBD	
Number of Engines	2	
Engine Serial Numbers		
Engine Application	Emergency	
Engine Type	4 Stroke, Rich Burn	
Method of Emission Control	None	
Horsepower	245	hp
Power Output	183	kWm
Fuel Consumption Rate	11,399	Btu/kW-hr
Fuel Consumption Rate	8,500	Btu/hp-hr
Annual Operation	100	hr/yr

Stack Parameters

Stack Height	≥ 12.0	ft
Stack Diameter	0.67	ft
Stack Temperature	500	°F
Stack Flow	736	cfm
	35.11	fps

Federal/State Standards Applicability

NSPS JJJJ	Yes	Certified
MACT ZZZZ	Yes	Remote
30 TAC 117	No	

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Compressor Engine

Section 3.0

EPN(s): GEN-1, GEN-2

FIN(s): GEN-1, GEN-2

Source Name: Emergency Engine (PSI Industrial 8.8L)

Fuel Data

Basis for Fuel Heat Content		Charlie Brown - Residue Gas
Fuel type		Field Gas
Heat Content	(LHV)	1,119 Btu/scf
	(HHV)	1,234 Btu/scf

Optional Engine Data

No. of Cylinders	8
Compression Ratio	8 : 1

Emission Factors (EF)

Pollutant	Unit	Pre-control	Claimed Control Efficiency	---	Source of EF Data
NOx	g/hp-hr	2.00	0%	2.00	Vendor Data
CO	g/hp-hr	3.28	0%	3.28	Vendor Data
VOC	g/hp-hr	0.92	0%	0.92	Vendor Data
HCHO	g/hp-hr	0.02	0%	0.02	Vendor Data

Does VOC EF include formaldehyde (HCHO)?	Yes
Does VOC EF include acetaldehyde/acrolein (aldehydes)?	Yes

Emission Calculations:

Pollutants	Emission Factor (EF)	Units	Source of Emission Factor	Engine Emissions	
				lb/hr	tpy
VOC (with Aldehydes)	0.92	g/hp-hr	Vendor Data	0.50	0.02
NO _x	2	g/hp-hr	Vendor Data	1.08	0.05
CO	3.28	g/hp-hr	Vendor Data	1.77	0.09
PM (condensable)	0.0001373	lb/MMBtu	AP-42, Table 3.2-3	2.86E-04	1.43E-05
PM ₁₀ (filterable)	0.0001667	lb/MMBtu	AP-42, Table 3.2-3	3.47E-04	1.74E-05
PM _{2.5} (filterable)	0.000049	lb/MMBtu	AP-42, Table 3.2-3	1.02E-04	5.10E-06
PM _{TOTAL/10/2.5}	0.0003039	lb/MMBtu	AP-42, Table 3.2-3	6.33E-04	3.16E-05
SO ₂	0.000588	lb/MMBtu	AP-42, Table 3.2-3	1.22E-03	6.12E-05
TOTAL HAP	--	--	See Speciated HAP	0.04	1.78E-03

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Compressor Engine

Section 3.0

EPN(s): GEN-1, GEN-2

FIN(s): GEN-1, GEN-2

Source Name: Emergency Engine (PSI Industrial 8.8L)

Emission Calculations - Speciated HAP:

Pollutants	Emission Factor (EF)	Units	Source of Emission Factor	Engine Emissions	
				lb/hr	tpy
1,1,2,2-Tetrachloroethane	0.0000253	lb/MMBtu	AP-42, Table 3.2-3	5.27E-05	2.63E-06
1,1,2-Trichloroethane	0.0000153	lb/MMBtu	AP-42, Table 3.2-3	3.19E-05	1.59E-06
1,3-Butadiene	0.000663	lb/MMBtu	AP-42, Table 3.2-3	1.38E-03	6.90E-05
1,3-Dichloropropene	0.0000127	lb/MMBtu	AP-42, Table 3.2-3	2.64E-05	1.32E-06
Acetaldehyde	0.00279	lb/MMBtu	AP-42, Table 3.2-3	0.01	2.91E-04
Acrolein	0.00263	lb/MMBtu	AP-42, Table 3.2-3	0.01	2.74E-04
Benzene	0.00158	lb/MMBtu	AP-42, Table 3.2-3	3.29E-03	1.65E-04
Carbon Tetrachloride	0.0000177	lb/MMBtu	AP-42, Table 3.2-3	3.69E-05	1.84E-06
Chlorobenzene	0.0000129	lb/MMBtu	AP-42, Table 3.2-3	2.69E-05	1.34E-06
Chloroform	0.0000137	lb/MMBtu	AP-42, Table 3.2-3	2.85E-05	1.43E-06
Ethylbenzene	0.0000248	lb/MMBtu	AP-42, Table 3.2-3	5.16E-05	2.58E-06
Ethylene Dibromide	0.0000213	lb/MMBtu	AP-42, Table 3.2-3	4.44E-05	2.22E-06
Formaldehyde (HCHO)	0.02	g/hp-hr	Vendor Data	0.01	5.40E-04
Methanol	0.00306	lb/MMBtu	AP-42, Table 3.2-3	0.01	3.19E-04
Methylene Chloride	0.0000412	lb/MMBtu	AP-42, Table 3.2-3	8.58E-05	4.29E-06
Naphthalene	0.0000971	lb/MMBtu	AP-42, Table 3.2-3	2.02E-04	1.01E-05
PAH	0.000141	lb/MMBtu	AP-42, Table 3.2-3	2.94E-04	1.47E-05
Styrene	0.0000119	lb/MMBtu	AP-42, Table 3.2-3	2.48E-05	1.24E-06
Toluene	0.000558	lb/MMBtu	AP-42, Table 3.2-3	1.16E-03	5.81E-05
Vinyl Chloride	0.0000072	lb/MMBtu	AP-42, Table 3.2-3	1.50E-05	7.48E-07
Xylenes	0.000195	lb/MMBtu	AP-42, Table 3.2-3	4.06E-04	2.03E-05

Equations used:

- Pollutant Emissions, lb/hr = (Pollutant EF, g/hp-hr) x (Engine Horsepower, hp) / (453.5924 g/lb)
- Pollutant Emissions, lb/hr = (Pollutant EF, lb/MMBtu) x (Engine Horsepower, hp) x (Fuel Consumption, Btu/hp-hr) / (10⁶)
- Pollutant Emissions, tpy = (Pollutant Emissions, lb/hr) x (Annual Operation, hr/yr) / (2,000 lb/ton)

Charlie Brown Compressor Station
Targa Midstream Services LLC
TCEQ Oil and Gas Non-Rule Standard Permit
July 2024

Reboiler

Section 3.1

EPN(s): HTR-1, HTR-2
FIN(s): HTR-1, HTR-2
Source Name: Glycol Heater, Glycol Heater

Total Emissions

Pollutant	lb/hr	tpy
VOC	0.01	0.02
Natural Gas VOC	0.01	0.02
NOx	0.10	0.43
CO	0.08	0.36
PM _{TOTAL/10/2.5}	0.01	0.03
HCHO	<0.01	<0.01
Benzene	<0.01	<0.01
HAPs	<0.01	0.01

lb/hr/unit	tpy/unit
<0.01	0.01
<0.01	0.01
0.05	0.21
0.04	0.18
<0.01	0.02
<0.01	<0.01
<0.01	<0.01
<0.01	<0.01

Calculation Basis:

External combustion emissions are calculated in accordance with AP-42 Section 1.4 (July 1998). A heating value of 1,020 Btu/scf is used with AP-42 emission factors, per footnote a of AP-42, Tables 1.4-1 and 1.4-2.

Background Information:

Maximum Rating	0.50	MMBtu/hr
Number of Units	2	
Annual Operation	8,760	hr/yr

Fuel Data

Basis for Fuel Heat Content	Default AP-42 Fuel Gas
Fuel type	Natural Gas
SO ₂ Calculation Basis	AP-42 Emission Factor
Fuel Heat Value ¹	1,020 Btu/scf
Fuel Heat Value (HHV)	1,020 Btu/scf

Emission Calculations:

Pollutant	Emission Factor	Units	Source of Emission Factor	Emission Rates	
				lb/hr	tpy
VOC	5.5	lb/MMscf	AP-42, Table 1.4-2	2.70E-03	0.01
NOx	100	lb/MMscf	AP-42, Table 1.4-1	0.05	0.21
CO	84	lb/MMscf	AP-42, Table 1.4-1	0.04	0.18
PM _{TOTAL/10/2.5}	7.6	lb/MMscf	AP-42, Table 1.4-2	3.73E-03	0.02
SO ₂	0.6	lb/MMscf	AP-42, Table 1.4-2	2.94E-04	1.29E-03
Total HAPs	--	--	See Speciated HAP	9.26E-04	4.05E-03

Charlie Brown Compressor Station
Targa Midstream Services LLC
TCEQ Oil and Gas Non-Rule Standard Permit
July 2024

Reboiler

Section 3.1

EPN(s): HTR-1, HTR-2
FIN(s): HTR-1, HTR-2
Source Name: Glycol Heater, Glycol Heater

Emission Calculations - Speciated HAP:

Pollutant	Emission Factor	Units	Source of Emission Factor	Emission Rates	
				lb/hr	tpy
Arsenic	0.0002	lb/MMscf	AP-42, Table 1.4-4	9.80E-08	4.29E-07
Benzene	0.0021	lb/MMscf	AP-42, Table 1.4-3	1.03E-06	4.51E-06
Beryllium	0.000012	lb/MMscf	AP-42, Table 1.4-4	5.88E-09	2.58E-08
Cadmium	0.0011	lb/MMscf	AP-42, Table 1.4-4	5.39E-07	2.36E-06
Chromium	0.0014	lb/MMscf	AP-42, Table 1.4-4	6.86E-07	3.01E-06
Cobalt	0.000084	lb/MMscf	AP-42, Table 1.4-4	4.12E-08	1.80E-07
Dichlorobenzene	0.0012	lb/MMscf	AP-42, Table 1.4-3	5.88E-07	2.58E-06
Formaldehyde (HCHO)	0.075	lb/MMscf	AP-42, Table 1.4-3	3.68E-05	1.61E-04
n-Hexane	1.8	lb/MMscf	AP-42, Table 1.4-3	8.82E-04	3.86E-03
Lead	0.0005	lb/MMscf	AP-42, Table 1.4-2	2.45E-07	1.07E-06
Manganese	0.00038	lb/MMscf	AP-42, Table 1.4-4	1.86E-07	8.16E-07
Mercury	0.00026	lb/MMscf	AP-42, Table 1.4-4	1.27E-07	5.58E-07
Naphthalene	0.00061	lb/MMscf	AP-42, Table 1.4-3	2.99E-07	1.31E-06
Nickel	0.0021	lb/MMscf	AP-42, Table 1.4-4	1.03E-06	4.51E-06
POM	0.000088	lb/MMscf	AP-42, Table 1.4-3	4.31E-08	1.89E-07
Toluene	0.0034	lb/MMscf	AP-42, Table 1.4-3	1.67E-06	7.30E-06
Selenium	0.000024	lb/MMscf	AP-42, Table 1.4-4	1.18E-08	5.15E-08

Equations used:

- A. Hourly Emissions, lb/hr = (Maximum Heat Capacity, MMBtu/hr) x (Emission Factor, lb/MMscf) / (Fuel Heat Value, Btu/scf)
- B. Annual Emissions, tpy = (Maximum Heat Capacity, MMBtu/hr) x (Annual Hours of Operation, hr/yr) x (Emission Factor, lb/MMscf) / (Fuel Heat Value, Btu/scf) / (2,000 lb/ton)

Equipment Leak Fugitives

Section 3.2

EPN(s): FUG-1
FIN(s): FUG-1
Source Name: Piping Component Fugitives

Total Emissions:

Pollutant	lb/hr	tpy
VOC	1.31	5.73
Crude Oil/ Condensate VOC	0.79	3.45
Natural Gas VOC	0.38	1.67
H ₂ S	<0.01	<0.01
Benzene	0.01	0.03
HAPs	0.12	0.53

Calculation Basis:

This site has unintentional emissions from pressurized equipment leaks. These emissions are fugitive in nature, and result from leakage through components such as valves, flanges, connectors, open-ended lines (OELs), pressure relief valves (PRVs), and other components. Emissions are estimated using emission factors from TCEQ's Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance (APDG 6422v2, Revised 06/18), which are based on US EPA's Protocol for Equipment Leak Emission Estimates, November 1995. Total emissions are then speciated using the stream compositions for the facility specified below.

A LDAR program compliant with NSPS OOOOa will be implemented for affected components, except compressors which are covered under NSPS KKK, within the process unit (in accordance with 40 CFR §60.5400a). Reductions from the 28 VHP LDAR program, which has comparable monitoring frequencies and leak detection limits, have been applied for each affected component type.

Calculation Method	
Emission Factors Used	Oil and Gas Production
Component Count Source	Actual
Applicable LDAR Program(s) (For Regulatory Compliance)	NSPS OOOOa
	NRSP
Annual Hours of Operation	8,760 hr/yr

Component Count Basis:

Component counts are actual counts provided by operator.

Equipment Leak Fugitives

Section 3.2

EPN(s): FUG-1
FIN(s): FUG-1
Source Name: Piping Component Fugitives

Emission Calculations

Area/Stream Name	Component		Service Type	Emission Factor lb/hr/ component	Pre-Control TOC Emissions		LDAR Program (for emission reduction credit)			Post-Control TOC Emissions	
	Type	Count			lb/hr	tpy	Program		% Red- uction	lb/hr	tpy
Inlet Gas	Valves	306	Gas	0.00992	3.036	13.296	NSPS OOOOa (28VHP)		97%	0.091	0.399
Inlet Gas	Flanges	816	Gas	0.00086	0.702	3.074	NSPS OOOOa (28VHP)		--	0.702	3.074
Inlet Gas	Connectors	556	Gas	0.00044	0.245	1.072	NSPS OOOOa (28VHP)		--	0.245	1.072
Inlet Gas	Compressor Seals	12	Gas	0.0194	0.233	1.020	NSPS OOOOa (28VHP)		85%	0.035	0.153
Inlet Gas	Relief Valves	39	Gas	0.0194	0.757	3.314	NSPS OOOOa (28VHP)		97%	0.023	0.099
Fuel/Residue Gas	Valves	183	Gas	0.00992	1.815	7.951	NSPS OOOOa (28VHP)		97%	0.054	0.239
Fuel/Residue Gas	Flanges	29	Gas	0.00086	0.025	0.109	NSPS OOOOa (28VHP)		--	0.025	0.109
Fuel/Residue Gas	Connectors	717	Gas	0.00044	0.315	1.382	NSPS OOOOa (28VHP)		--	0.315	1.382
Fuel/Residue Gas	Relief Valves	21	Gas	0.0194	0.407	1.784	NSPS OOOOa (28VHP)		97%	0.012	0.054
Condensate	Valves	413	Light Liquid	0.0055	2.272	9.949	NSPS OOOOa (28VHP)		97%	0.068	0.298
Condensate	Flanges	34	Light Liquid	0.000243	0.008	0.036	NSPS OOOOa (28VHP)		--	0.008	0.036
Condensate	Connectors	1,335	Light Liquid	0.000463	0.618	2.707	NSPS OOOOa (28VHP)		--	0.618	2.707
Condensate	Relief Valves	3	Light Liquid	0.0165	0.050	0.217	NSPS OOOOa (28VHP)		--	0.050	0.217
Produced Water	Valves	29	Water/Light Oil	0.000216	0.006	0.027	NSPS OOOOa (28VHP)		--	0.006	0.027
Produced Water	Pump Seals	12	Water/Light Oil	0.000052	0.001	0.003	NSPS OOOOa (28VHP)		--	0.001	0.003
Produced Water	Flanges	10	Water/Light Oil	0.000006	<0.001	<0.001	NSPS OOOOa (28VHP)		--	<0.001	<0.001
Produced Water	Connectors	152	Water/Light Oil	0.000243	0.037	0.162	NSPS OOOOa (28VHP)		--	0.037	0.162
Methanol	Valves	55	Light Liquid	0.0055	0.303	1.325	NSPS OOOOa (28VHP)		97%	0.009	0.040
Methanol	Pump Seals	10	Light Liquid	0.02866	0.287	1.255	NSPS OOOOa (28VHP)		85%	0.043	0.188
Methanol	Flanges	360	Light Liquid	0.000243	0.087	0.383	NSPS OOOOa (28VHP)		--	0.087	0.383
Subtotals by Area/Stream:		Count			lb/hr	tpy				lb/hr	tpy
Inlet Gas		1,729			4.971	21.774				1.095	4.796
Fuel/Residue Gas		950			2.563	11.227				0.407	1.783
Condensate		1,785			2.947	12.909				0.744	3.259
Produced Water		203			0.044	0.192				0.044	0.192
Methanol		425			0.677	2.963				0.140	0.611
TOTAL		5,092			11.202	49.066				2.430	10.642

Equations Used:

- A. Pre-Control Hourly Emissions, lb/hr = (Emission Factor, lb/hr/component) x (Component Count)
- B. Pre-Control Annual Emissions, tpy = (Uncontrolled Hourly Emissions, lb/hr) x (Hours of Operation Per Year, hr/yr) / (2,000 lb/ton)
- C. Post-Control Emissions, lb/hr or tpy = (Uncontrolled Emissions, lb/hr or tpy) x (1 - LDAR Program Control Efficiency, %)

Equipment Leak Fugitives

Section 3.2

EPN(s): FUG-1
FIN(s): FUG-1
Source Name: Piping Component Fugitives

Pre-Control Speciated Emissions

Area/Stream Name:	Inlet Gas			Fuel/Residue Gas			Condensate			Produced Water			Methanol		
Pollutant	Wt%	lb/hr	tpy	Wt%	lb/hr	tpy	Wt%	lb/hr	tpy	Wt%	lb/hr	tpy	Wt%	lb/hr	tpy
TOC	95.93%	4.971	21.774	96.21%	2.563	11.227	100.00%	2.947	12.909	100.00%	0.044	0.192	100.00%	0.677	2.963
VOC	25.09%	1.300	5.696	22.29%	0.594	2.601	100.00%	2.947	12.909	100.00%	0.044	0.192	100.00%	0.677	2.963
HAPs	0.68%	0.035	0.155	--	--	--	14.38%	0.424	1.856	14.38%	0.006	0.028	--	--	--
H2S	0.0016%	<0.001	<0.001	0.0072%	<0.001	0.001	0.0003%	<0.001	<0.001	0.0003%	<0.001	<0.001	--	--	--
Propane (C3)	13.32%	0.690	3.023	12.80%	0.341	1.493	0.72%	0.021	0.092	0.72%	<0.001	0.001	--	--	--
Isobutane (i-C4)	1.29%	0.067	0.294	1.24%	0.033	0.145	0.35%	0.010	0.045	0.35%	<0.001	0.001	--	--	--
n-Butane (n-C4)	4.80%	0.249	1.089	4.37%	0.116	0.510	2.49%	0.073	0.321	2.49%	0.001	0.005	--	--	--
Isopentane (i-C5)	1.12%	0.058	0.255	0.95%	0.025	0.110	2.73%	0.081	0.353	2.73%	0.001	0.005	--	--	--
n-Pentane (n-C5)	1.31%	0.068	0.298	1.18%	0.031	0.138	4.75%	0.140	0.613	4.75%	0.002	0.009	--	--	--
Other Hexanes (C6)	0.81%	0.042	0.184	1.75%	0.047	0.204	5.51%	0.163	0.712	5.51%	0.002	0.011	--	--	--
Heptanes (C7)	1.09%	0.056	0.247	--	--	--	23.18%	0.683	2.992	23.18%	0.010	0.045	--	--	--
Octanes (C8)	0.53%	0.027	0.120	--	--	--	25.85%	0.762	3.337	25.85%	0.011	0.050	--	--	--
Nonanes (C9)	0.11%	0.005	0.024	--	--	--	12.47%	0.367	1.609	12.47%	0.005	0.024	--	--	--
Decanes Plus (C10+)	0.03%	0.001	0.006	--	--	--	7.46%	0.220	0.963	7.46%	0.003	0.014	--	--	--
Benzene	0.05%	0.003	0.012	--	--	--	0.81%	0.024	0.104	0.81%	<0.001	0.002	--	--	--
Toluene	0.04%	0.002	0.009	--	--	--	1.78%	0.052	0.229	1.78%	0.001	0.003	--	--	--
Ethylbenzene	0.01%	0.001	0.002	--	--	--	0.95%	0.028	0.122	0.95%	<0.001	0.002	--	--	--
Xylenes	0.01%	0.001	0.003	--	--	--	2.01%	0.059	0.259	2.01%	0.001	0.004	--	--	--
n-Hexane	0.42%	0.022	0.095	--	--	--	4.72%	0.139	0.609	4.72%	0.002	0.009	--	--	--
2,2,4-Trimethylpentane	0.15%	0.008	0.033	--	--	--	4.12%	0.121	0.532	4.12%	0.002	0.008	--	--	--
Note Reference:	[1]			[2]			[3]			[4]			[5]		

[1] Inlet Gas service stream composition based on theFuel heat content is based on the site-specific sample taken from Charlie Brown - Inlet Gas (sampled on 07/08/2024).

[2] Fuel/Residue Gas service stream composition based on theFuel heat content is based on the site-specific sample taken from Charlie Brown - Residue Gas (sampled on 07/08/2024).

[3] Condensate service stream composition based on theFuel heat content is based on the site-specific sample taken from Charlie Brown - Hydrocarbon Liquid (sampled on 06/25/2024).. VOC weight % is conservatively represented as 100%.

[4] Produced Water service stream composition based on theFuel heat content is based on the site-specific sample taken from Charlie Brown - Hydrocarbon Liquid (sampled on 06/25/2024).. VOC weight % is conservatively represented as 100%.

[5] Methanol service stream composition based on theservice stream composition conservatively based on 100% VOC.. VOC weight % is conservatively represented as 100%.

Equations Used:

D. Per Service Type: (Emission of Individual Pollutant, lb/hr or tpy) = (Sum of Emissions per Service Type, lb/hr or tpy) x (Individual Pollutant Content per Service Type, Wt%) / (TOC Emissions per Service Type, lb/hr or tpy)

Equipment Leak Fugitives

Section 3.2

EPN(s): FUG-1
FIN(s): FUG-1
Source Name: Piping Component Fugitives

Post-Control Speciated Emissions

Area/Stream Name:	Inlet Gas			Fuel/Residue Gas			Condensate			Produced Water			Methanol		
Pollutant	Wt%	lb/hr	tpy	Wt%	lb/hr	tpy	Wt%	lb/hr	tpy	Wt%	lb/hr	tpy	Wt%	lb/hr	tpy
TOC	95.93%	1.095	4.796	96.21%	0.407	1.783	100.00%	0.744	3.259	100.00%	0.044	0.192	100.00%	0.140	0.611
VOC	25.09%	0.286	1.255	22.29%	0.094	0.413	100.00%	0.744	3.259	100.00%	0.044	0.192	100.00%	0.140	0.611
HAPs	0.68%	0.008	0.034	--	--	--	14.38%	0.107	0.469	14.38%	0.006	0.028	--	--	--
H2S	0.00%	<0.001	<0.001	0.0072%	<0.001	<0.001	0.0003%	<0.001	<0.001	0.0003%	<0.001	<0.001	--	--	--
Propane (C3)	13.32%	0.152	0.666	12.80%	0.054	0.237	0.72%	0.005	0.023	0.72%	<0.001	0.001	--	--	--
Isobutane (i-C4)	1.29%	0.015	0.065	1.24%	0.005	0.023	0.35%	0.003	0.011	0.35%	<0.001	0.001	--	--	--
n-Butane (n-C4)	4.80%	0.055	0.240	4.37%	0.019	0.081	2.49%	0.019	0.081	2.49%	0.001	0.005	--	--	--
Isopentane (i-C5)	1.12%	0.013	0.056	0.95%	0.004	0.018	2.73%	0.020	0.089	2.73%	0.001	0.005	--	--	--
n-Pentane (n-C5)	1.31%	0.015	0.066	1.18%	0.005	0.022	4.75%	0.035	0.155	4.75%	0.002	0.009	--	--	--
Other Hexanes (C6)	0.81%	0.009	0.041	1.75%	0.007	0.032	5.51%	0.041	0.180	5.51%	0.002	0.011	--	--	--
Heptanes (C7)	1.09%	0.012	0.054	--	--	--	23.18%	0.172	0.755	23.18%	0.010	0.045	--	--	--
Octanes (C8)	0.53%	0.006	0.026	--	--	--	25.85%	0.192	0.842	25.85%	0.011	0.050	--	--	--
Nonanes (C9)	0.11%	0.001	0.005	--	--	--	12.47%	0.093	0.406	12.47%	0.005	0.024	--	--	--
Decanes Plus (C10+)	0.03%	<0.001	0.001	--	--	--	7.46%	0.056	0.243	7.46%	0.003	0.014	--	--	--
Benzene	0.05%	0.001	0.003	--	--	--	0.81%	0.006	0.026	0.81%	<0.001	0.002	--	--	--
Toluene	0.04%	<0.001	0.002	--	--	--	1.78%	0.013	0.058	1.78%	0.001	0.003	--	--	--
Ethylbenzene	0.01%	<0.001	<0.001	--	--	--	0.95%	0.007	0.031	0.95%	<0.001	0.002	--	--	--
Xylenes	0.01%	<0.001	0.001	--	--	--	2.01%	0.015	0.065	2.01%	0.001	0.004	--	--	--
n-Hexane	0.42%	0.005	0.021	--	--	--	4.72%	0.035	0.154	4.72%	0.002	0.009	--	--	--
2,2,4-Trimethylpentane	0.15%	0.002	0.007	--	--	--	4.12%	0.031	0.134	4.12%	0.002	0.008	--	--	--

Equations Used:
E. Per Service Type: (Emission of Individual Pollutant, lb/hr or tpy) = (Sum of Emissions per Service Type, lb/hr or tpy) x (Individual Pollutant Content per Service Type, Wt%) / (TOC Emissions per Service Type, lb/hr or tpy)

Equipment Leak Fugitives

Section 3.2

EPN(s): FUG-1
FIN(s): FUG-1
Source Name: Piping Component Fugitives

Total Speciated Emissions

Pollutant	Hourly lb/hr	Annual tpy
TOC	2.430	10.642
VOC	1.308	5.730
HAPs	0.121	0.530
H2S	<0.001	<0.001
Propane (C3)	0.212	0.928
Isobutane (i-C4)	0.023	0.100
n-Butane (n-C4)	0.093	0.407
Isopentane (i-C5)	0.038	0.168
n-Pentane (n-C5)	0.057	0.251
Other Hexanes (C6)	0.060	0.263
Heptanes (C7)	0.195	0.854
Octanes (C8)	0.210	0.918
Nonanes (C9)	0.099	0.435
Decanes Plus (C10+)	0.059	0.259
Benzene	0.007	0.031
Toluene	0.014	0.063
Ethylbenzene	0.008	0.033
Xylenes	0.016	0.070
n-Hexane	0.042	0.184
2,2,4-Trimethylpentane	0.034	0.149

ProMax Modeled Source - Condensate Tank TK-2

Section 3.3

EPN(s): TK-2
FIN(s): TK-2
Source Name: Condensate Tank

Total Emissions:

Pollutant	lb/hr	tpy
VOC	19.15	0.70
Crude Oil/ Condensate VOC	19.15	0.70
H ₂ S	0.01	2.28E-04
Benzene	0.15	4.60E-03
HAPs	1.12	0.03

Calculation Basis:

Emissions from the storage tanks were modeled in BR&E ProMax Process Simulator Software. A summary of the simulation results are presented below. The full ProMax report is included in the supporting documentation section of this application.
The Gas Constant is based on Standard Conditions as defined by API (60 °F and 101.325 kPa).

Background Information

Condensate Tank

Material Stored	Condensate
Tank Capacity	210 bbl
Emissions Routed to	Atmosphere
Number of Tanks	1
Tank Type	Vertical Cylinder
Tank Color	Beige/Cream
Tank Height	15.0 ft
Tank Diameter	10.0 ft
Condensate Throughput - All Tanks (Avg Daily)	1.5 bbl/day
Condensate Throughput - All Tanks (Annual)	546.9 bbl/yr
Condensate Throughput - Per Tank (Hourly)	42.9 bbl/hr/tank
Condensate Throughput - Per Tank (Avg Daily)	1.5 bbl/day/tank
Condensate Throughput - Per Tank (Annual)	546.9 bbl/yr/tank
Gas Constant at STP	379.48 scf/lb-mole
Nearest City for Tank Meteorology	Midland, TX

ProMax Modeled Source - Condensate Tank TK-2

Section 3.3

EPN(s): TK-2
FIN(s): TK-2
Source Name: Condensate Tank

ProMax Results - Emissions: Condensate Tank

Component	Flashing Losses		Working Losses		Standing Losses		TOTAL Losses	
	Hourly lb/hr	Annual tpy	Hourly lb/hr	Annual tpy	Hourly lb/hr	Annual tpy	Hourly lb/hr	Annual tpy
H2S	--	--	0.01	2.59E-05	--	2.02E-04	0.01	2.28E-04
Carbon Dioxide	--	--	0.30	4.67E-04	--	3.66E-03	0.30	4.12E-03
Methane (C1)	--	--	1.90	1.38E-03	--	0.01	1.90	0.01
Ethane (C2)	--	--	1.96	0.01	--	0.05	1.96	0.06
Propane (C3)	--	--	4.64	0.02	--	0.17	4.64	0.20
Isobutane (i-C4)	--	--	0.96	4.28E-03	--	0.03	0.96	0.04
n-Butane (n-C4)	--	--	4.73	0.02	--	0.16	4.73	0.18
Isopentane (i-C5)	--	--	2.07	0.01	--	0.06	2.07	0.07
n-Pentane (n-C5)	--	--	2.74	0.01	--	0.08	2.74	0.09
Other Hexanes (C6)	--	--	0.28	1.05E-03	--	0.01	0.28	0.01
Heptanes (C7)	--	--	1.52	4.98E-03	--	0.04	1.52	0.04
Octanes (C8)	--	--	0.97	2.96E-03	--	0.02	0.97	0.03
Nonanes (C9)	--	--	0.10	2.70E-04	--	2.11E-03	0.10	2.38E-03
Decanes Plus (C10+)	--	--	0.02	5.30E-05	--	4.14E-04	0.02	4.67E-04
Benzene	--	--	0.15	5.21E-04	--	4.08E-03	0.15	4.60E-03
Toluene	--	--	0.09	3.03E-04	--	2.37E-03	0.09	2.67E-03
Ethylbenzene	--	--	0.02	4.83E-05	--	3.78E-04	0.02	4.26E-04
Xylenes	--	--	0.03	9.12E-05	--	7.13E-04	0.03	8.05E-04
n-Hexane	--	--	0.84	2.92E-03	--	0.02	0.84	0.03
TOTAL	--	--	23.31	0.09	--	0.69	23.31	0.77
VOC	--	--	19.15	0.08	--	0.62	19.15	0.70
HAPs	--	--	1.10	3.80E-03	--	0.03	1.12	0.03

ProMax Results - Other Properties:

Vapor Molecular Weight - Annual Average (from ProMax Report)	40.52 lb/lb-mole
Vapor Molecular Weight - Worst-Case Hourly (from ProMax Report)	44.92 lb/lb-mole
Net Heating Value - Hourly (Calculated Value)	2,314 Btu/scf
Net Ideal Gas Heating Value - Annual (from ProMax Report)	2,730 Btu/scf
Standard Vapor Volumetric Flow (from ProMax Report)	0.0 MMscf/day
Hourly Stream Flow	218.29 scf/hr
Annual Stream Flow	11,100.28 scf/yr

Equations Used

- A. Hourly Stream Flow, scf/hr = (Hourly Emissions, lb/hr) x (Vapor Molecular Weight, lb/lb-mol) / (Gas Constant, scf/lb-mole)
- B. Annual Stream Flow, scf/yr = (Stream Flow, MMscf/day) x (1,000,000 scf/MMscf) x (365 days/yr)
- C. Net Heating Value - Hourly, Btu/scf = Σ (mol%_{component} x Net Heating Value_{component})

ProMax Modeled Source - Produced Water Tank TK-3

Section 3.4

EPN(s): TK-3
FIN(s): TK-3
Source Name: Produced Water Tank

Total Emissions:

Pollutant	lb/hr	tpy
VOC	31.04	1.16
Crude Oil/ Condensate VOC	31.04	1.16
H ₂ S	5.05E-04	1.92E-05
Benzene	0.24	0.01
HAPs	2.65	0.07

Calculation Basis:

Emissions from the storage tanks were modeled in BR&E ProMax Process Simulator Software. A summary of the simulation results are presented below. The full ProMax report is included in the supporting documentation section of this application.
The Gas Constant is based on Standard Conditions as defined by API (60 °F and 101.325 kPa).

Background Information

Produced Water Tank

Material Stored	Produced Water
Tank Capacity	210 bbl
Emissions Routed to	Atmosphere
Number of Tanks	1
Tank Type	Vertical Cylinder
Tank Color	Beige/Cream
Tank Height	15.0 ft
Tank Diameter	10.0 ft
Produced Water Throughput - All Tanks (Avg Daily)	36.4 bbl/day
Produced Water Throughput - All Tanks (Annual)	13,303.6 bbl/yr
Produced Water Throughput - Per Tank (Hourly)	107.1 bbl/hr/tank
Produced Water Throughput - Per Tank (Avg Daily)	36.4 bbl/day/tank
Produced Water Throughput - Per Tank (Annual)	13,303.6 bbl/yr/tank
Gas Constant at STP	379.48 scf/lb-mole
Nearest City for Tank Meteorology	Midland, TX

ProMax Modeled Source - Produced Water Tank TK-3

Section 3.4

EPN(s): TK-3

FIN(s): TK-3

Source Name: Produced Water Tank

ProMax Results - Emissions: Produced Water Tank

Component	Flashing Losses		Working Losses		Standing Losses		TOTAL Losses	
	Hourly lb/hr	Annual tpy	Hourly lb/hr	Annual tpy	Hourly lb/hr	Annual tpy	Hourly lb/hr	Annual tpy
H2S	--	--	5.05E-04	1.33E-05	--	5.95E-06	5.05E-04	1.92E-05
Carbon Dioxide	--	--	0.02	6.84E-04	--	3.07E-04	0.02	9.91E-04
Methane (C1)	--	--	0.05	2.01E-03	--	9.03E-04	0.05	2.92E-03
Ethane (C2)	--	--	0.23	0.01	--	4.49E-03	0.23	0.01
Propane (C3)	--	--	1.83	0.08	--	0.04	1.83	0.11
Isobutane (i-C4)	--	--	0.90	0.04	--	0.02	0.90	0.06
n-Butane (n-C4)	--	--	6.38	0.26	--	0.12	6.38	0.38
Isopentane (i-C5)	--	--	5.14	0.11	--	0.05	5.14	0.16
n-Pentane (n-C5)	--	--	6.86	0.14	--	0.06	6.86	0.20
Other Hexanes (C6)	--	--	0.70	0.01	--	0.01	0.70	0.02
Heptanes (C7)	--	--	3.82	0.07	--	0.03	3.82	0.10
Octanes (C8)	--	--	2.42	0.04	--	0.02	2.42	0.06
Nonanes (C9)	--	--	0.26	3.58E-03	--	1.61E-03	0.26	0.01
Decanes Plus (C10+)	--	--	0.06	7.02E-04	--	3.15E-04	0.06	1.02E-03
Benzene	--	--	0.24	4.60E-03	--	2.06E-03	0.24	0.01
Toluene	--	--	0.21	3.67E-03	--	1.65E-03	0.21	0.01
Ethylbenzene	--	--	0.04	6.28E-04	--	2.81E-04	0.04	9.09E-04
Xylenes	--	--	0.08	1.19E-03	--	5.34E-04	0.08	1.73E-03
n-Hexane	--	--	2.11	0.04	--	0.02	2.11	0.06
Water	--	--	1.48	0.02	--	0.01	1.48	0.03
TOTAL	--	--	32.81	0.84	--	0.38	32.81	1.21
VOC	--	--	31.04	0.80	--	0.36	31.04	1.16
HAPs	--	--	2.60	0.05	--	0.02	2.65	0.07

ProMax Results - Other Properties:

Vapor Molecular Weight - Annual Average (from ProMax Report)	50.03 lb/lb-mole
Vapor Molecular Weight - Worst-Case Hourly (from ProMax Report)	51.98 lb/lb-mole
Net Heating Value - Hourly (Calculated Value)	2,545 Btu/scf
Net Ideal Gas Heating Value - Annual (from ProMax Report)	2,999 Btu/scf
Standard Vapor Volumetric Flow (from ProMax Report)	0.0 MMscf/day
Hourly Stream Flow	248.88 scf/hr
Annual Stream Flow	15,338.95 scf/yr

Equations Used

- Hourly Stream Flow, scf/hr = (Hourly Emissions, lb/hr) x (Vapor Molecular Weight, lb/lb-mol) / (Gas Constant, scf/lb-mole)
- Annual Stream Flow, scf/yr = (Stream Flow, MMscf/day) x (1,000,000 scf/MMscf) x (365 days/yr)
- Net Heating Value - Hourly, Btu/scf = $\sum (\text{mol}\%_{\text{component}} \times \text{Net Heating Value}_{\text{component}})$

ProMax Modeled Source - Methanol Tanks TK-4, TK-8

Section 3.5

EPN(s): TK-4, TK-8
FIN(s): TK-4, TK-8
Source Name: Methanol Tank, Methanol Tank

Total Emissions:

Pollutant	lb/hr	tpy
VOC	6.00	0.04
Crude Oil/ Condensate VOC	6.00	0.04

Calculation Basis:

Emissions from the storage tanks were modeled in BR&E ProMax Process Simulator Software. A summary of the simulation results are presented below. The full ProMax report is included in the supporting documentation section of this application.
The Gas Constant is based on Standard Conditions as defined by API (60 °F and 101.325 kPa).

Background Information

Methanol Tanks

Material Stored	Methanol
Tank Capacity	2,000 gal
Emissions Routed to	Atmosphere
Number of Tanks	2
Tank Type	Horizontal Cylinder
Tank Color	White
Tank Height	12.0 ft
Tank Diameter	5.0 ft
Methanol Throughput - All Tanks (Avg Daily)	1.5 bbl/day
Methanol Throughput - All Tanks (Annual)	560.6 bbl/yr
Methanol Throughput - Per Tank (Hourly)	23.8 bbl/hr/tank
Methanol Throughput - Per Tank (Avg Daily)	1.5 bbl/day/tank
Methanol Throughput - Per Tank (Annual)	560.6 bbl/yr/tank
Gas Constant at STP	379.48 scf/lb-mole
Nearest City for Tank Meteorology	Midland, TX

ProMax Results - Emissions: Methanol Tanks (All Tanks)

Component	Flashing Losses		Working Losses		Standing Losses		TOTAL Losses	
	Hourly lb/hr	Annual tpy	Hourly lb/hr	Annual tpy	Hourly lb/hr	Annual tpy	Hourly lb/hr	Annual tpy
Methanol	--	--	6.00	0.02	--	0.02	6.00	0.04
TOTAL	--	--	6.00	0.02	--	0.02	6.00	0.04
VOC	--	--	6.00	0.02	--	0.02	6.00	0.04

ProMax Modeled Source - Methanol Tanks TK-4, TK-8

Section 3.5

EPN(s): TK-4, TK-8
FIN(s): TK-4, TK-8
Source Name: Methanol Tank, Methanol Tank

ProMax Results - Other Properties:

Vapor Molecular Weight - Annual Average (from ProMax Report)	32.04 lb/lb-mole
Net Ideal Gas Heating Value - Annual (from ProMax Report)	766 Btu/scf
Standard Vapor Volumetric Flow (from ProMax Report)	0.0052 MMscf/day
Hourly Stream Flow	71.11 scf/hr
Annual Stream Flow	1,886,224.87 scf/yr

Equations Used

- A. Hourly Stream Flow, scf/hr = (Hourly Emissions, lb/hr) x (Vapor Molecular Weight, lb/lb-mol) / (Gas Constant, scf/lb-mole)
- B. Annual Stream Flow, scf/yr = (Stream Flow, MMscf/day) x (1,000,000 scf/MMscf) x (365 days/yr)

ProMax Modeled Source - Glycol Dehydrator

Section 3.6

EPN(s): DEHY-1
FIN(s): DEHY-1
Source Name: Glycol Heater/Glycol Dehy Unit 1

Total Emissions:

Pollutant	lb/hr	tpy
VOC	0.08	0.35
Natural Gas VOC	0.08	0.35
H ₂ S	6.88E-05	3.01E-04
Benzene	0.01	0.03
HAPs	0.01	0.04

Calculation Basis:

Emissions from the glycol dehydrator were modeled in BR&E ProMax Process Simulator Software. See Supporting Documentation Section for a copy of the full report.

Background Information

Annual Operating Hours	8,760 hr/yr
Wet Gas Temperature	100 °F
Wet Gas Pressure	950 psig
Wet Gas Flow Rate	2.5 MMSCFD
Is there a Flash Tank?	Flash Tank Present
Flash Tank Emissions Routed to	Recycle/Recompression
Is the Regenerator equipped with a Condenser?	Yes
Regenerator Still Vent Emissions Routed to	Reboiler (Cycling On/Off) + Glowplug

ProMax Modeled Source - Glycol Dehydrator

Section 3.6

EPN(s): DEHY-1
FIN(s): DEHY-1
Source Name: Glycol Heater/Glycol Dehy Unit 1

ProMax Results - Glycol Dehydrator - Flash Tank

Component	Pre-Control		Post-Control	
	lb/hr	tpy	lb/hr	tpy
H2S	0.01	0.03	--	--
Nitrogen	2.30	10.09	4,005.54	17,544.27
Carbon Dioxide	3.70	16.23	341.56	1,496.03
Methane (C1)	60.76	266.11	--	--
Ethane (C2)	18.79	82.30	--	--
Propane (C3)	19.36	84.80	--	--
Isobutane (i-C4)	1.90	8.32	--	--
n-Butane (n-C4)	7.98	34.96	--	--
Isopentane (i-C5)	1.86	8.16	--	--
n-Pentane (n-C5)	2.34	10.26	--	--
Other Hexanes (C6)	0.39	1.70	--	--
Heptanes (C7)	3.41	14.94	--	--
Benzene	0.15	0.66	--	--
Toluene	0.07	0.30	--	--
Ethylbenzene	0.01	0.04	--	--
Xylenes	0.01	0.06	--	--
n-Hexane	0.74	3.23	--	--
2,2,4-Trimethylpentane	0.21	0.92	--	--
Triethylene Glycol	1.52E-04	6.64E-04	--	--
Water	0.11	0.49	230.43	1,009.28
TOTAL	124.11	543.60	4,577.53	20,049.59
VOC	38.44	168.35	--	--
HAPS	1.19	5.22	--	--
Gas Heating Value	1,216 Btu/scf			
Hourly Stream Flow	2,013.40 scf/hr			
Annual Stream Flow	17,637,385.34 scf/yr			

Equations Used

- A. (Annual Emissions, tpy) = (Average Hourly Emissions, lb/hr) x (8,760 hr/yr) / (2,000 lb/ton)
B. (Annual Stream Flow, scf/yr) = (Hourly Stream Flow, scf/hr) x (8,760 hr/yr)

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TCEQ Oil and Gas Non-Rule Standard Permit
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ProMax Modeled Source - Glycol Dehydrator

Section 3.6

EPN(s): DEHY-1

FIN(s): DEHY-1

Source Name: Glycol Heater/Glycol Dehy Unit 1

ProMax results - Glycol Dehydrator - Regenerator Still Vent

Component	Pre-Control		Post-Control	
	lb/hr	tpy	lb/hr	tpy
H2S	3.77E-03	0.02	6.88E-05	3.01E-04
Nitrogen	3.27E-03	0.01	154.12	675.03
Carbon Dioxide	0.38	1.66	14.67	64.24
Methane (C1)	0.42	1.86	0.01	0.04
Ethane (C2)	0.59	2.57	0.01	0.05
Propane (C3)	1.33	5.83	0.02	0.10
Isobutane (i-C4)	0.19	0.83	2.98E-03	0.01
n-Butane (n-C4)	1.26	5.52	0.02	0.08
Isopentane (i-C5)	0.50	2.21	4.92E-03	0.02
n-Pentane (n-C5)	0.81	3.55	0.01	0.03
Other Hexanes (C6)	0.63	2.77	3.73E-03	0.02
Heptanes (C7)	6.55	28.70	0.01	0.04
Benzene	2.73	11.95	0.01	0.03
Toluene	2.66	11.65	1.87E-03	0.01
Ethylbenzene	0.68	2.98	1.43E-04	6.27E-04
Xylenes	1.10	4.82	2.29E-04	1.00E-03
n-Hexane	0.49	2.16	1.71E-03	0.01
2,2,4-Trimethylpentane	0.33	1.46	4.45E-04	1.95E-03
Triethylene Glycol	0.01	0.05	2.55E-12	1.12E-11
Water	51.17	224.11	7.47	32.73
TOTAL	71.86	314.73	176.36	772.44
VOC	19.29	84.50	0.08	0.35
HAPS	8.00	35.02	0.01	0.04
Gas Heating Value	1,476 Btu/scf			
Hourly Stream Flow	1,188.11 scf/hr			
Annual Stream Flow	10,407,816.12 scf/yr			

Equations Used

A. (Annual Emissions, tpy) = (Average Hourly Emissions, lb/hr) x (8,760 hr/yr) / (2,000 lb/ton)

B. (Annual Stream Flow, scf/yr) = (Hourly Stream Flow, scf/hr) x (8,760 hr/yr)

ProMax Modeled Source - Glycol Dehydrator

Section 3.6

EPN(s): DEHY-2
FIN(s): DEHY-2
Source Name: Glycol Heater/Glycol Dehy Unit 2

Total Emissions:

Pollutant	lb/hr	tpy
VOC	0.08	0.35
Natural Gas VOC	0.08	0.35
H ₂ S	6.88E-05	3.01E-04
Benzene	0.01	0.03
HAPs	0.01	0.04

Calculation Basis:

Emissions from the glycol dehydrator were modeled in BR&E ProMax Process Simulator Software. See Supporting Documentation Section for a copy of the full report.

Background Information

Annual Operating Hours	8,760 hr/yr
Wet Gas Temperature	100 °F
Wet Gas Pressure	950 psig
Wet Gas Flow Rate	2.5 MMSCFD
Is there a Flash Tank?	Flash Tank Present
Flash Tank Emissions Routed to	Recycle/Recompression
Is the Regenerator equipped with a Condenser?	Yes
Regenerator Still Vent Emissions Routed to	Reboiler (Cycling On/Off) + Glowplug

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ProMax Modeled Source - Glycol Dehydrator

Section 3.6

EPN(s): DEHY-2

FIN(s): DEHY-2

Source Name: Glycol Heater/Glycol Dehy Unit 2

ProMax Results - Glycol Dehydrator - Flash Tank

Component	Pre-Control		Post-Control	
	lb/hr	tpy	lb/hr	tpy
H2S	0.01	0.03	--	--
Nitrogen	2.30	10.09	4,005.54	17,544.27
Carbon Dioxide	3.70	16.23	341.56	1,496.03
Methane (C1)	60.76	266.11	--	--
Ethane (C2)	18.79	82.30	--	--
Propane (C3)	19.36	84.80	--	--
Isobutane (i-C4)	1.90	8.32	--	--
n-Butane (n-C4)	7.98	34.96	--	--
Isopentane (i-C5)	1.86	8.16	--	--
n-Pentane (n-C5)	2.34	10.26	--	--
Other Hexanes (C6)	0.39	1.70	--	--
Heptanes (C7)	3.41	14.94	--	--
Benzene	0.15	0.66	--	--
Toluene	0.07	0.30	--	--
Ethylbenzene	0.01	0.04	--	--
Xylenes	0.01	0.06	--	--
n-Hexane	0.74	3.23	--	--
2,2,4-Trimethylpentane	0.21	0.92	--	--
Triethylene Glycol	1.52E-04	6.64E-04	--	--
Water	0.11	0.49	230.43	1,009.28
TOTAL	124.11	543.60	4,577.53	20,049.59
VOC	38.44	168.35	--	--
HAPS	1.19	5.22	--	--
Gas Heating Value	1,216 Btu/scf			
Hourly Stream Flow	2,013.40 scf/hr			
Annual Stream Flow	17,637,385.34 scf/yr			

Equations Used

A. (Annual Emissions, tpy) = (Average Hourly Emissions, lb/hr) x (8,760 hr/yr) / (2,000 lb/ton)

B. (Annual Stream Flow, scf/yr) = (Hourly Stream Flow, scf/hr) x (8,760 hr/yr)

ProMax Modeled Source - Glycol Dehydrator

Section 3.6

EPN(s): DEHY-2
FIN(s): DEHY-2
Source Name: Glycol Heater/Glycol Dehy Unit 2

ProMax results - Glycol Dehydrator - Regenerator Still Vent

Component	Pre-Control		Post-Control	
	lb/hr	tpy	lb/hr	tpy
H2S	3.77E-03	0.02	6.88E-05	3.01E-04
Nitrogen	3.27E-03	0.01	154.12	675.03
Carbon Dioxide	0.38	1.66	14.67	64.24
Methane (C1)	0.42	1.86	0.01	0.04
Ethane (C2)	0.59	2.57	0.01	0.05
Propane (C3)	1.33	5.83	0.02	0.10
Isobutane (i-C4)	0.19	0.83	2.98E-03	0.01
n-Butane (n-C4)	1.26	5.52	0.02	0.08
Isopentane (i-C5)	0.50	2.21	4.92E-03	0.02
n-Pentane (n-C5)	0.81	3.55	0.01	0.03
Other Hexanes (C6)	0.63	2.77	3.73E-03	0.02
Heptanes (C7)	6.55	28.70	0.01	0.04
Benzene	2.73	11.95	0.01	0.03
Toluene	2.66	11.65	1.87E-03	0.01
Ethylbenzene	0.68	2.98	1.43E-04	6.27E-04
Xylenes	1.10	4.82	2.29E-04	1.00E-03
n-Hexane	0.49	2.16	1.71E-03	0.01
2,2,4-Trimethylpentane	0.33	1.46	4.45E-04	1.95E-03
Triethylene Glycol	0.01	0.05	2.55E-12	1.12E-11
Water	51.17	224.11	7.47	32.73
TOTAL	71.86	314.73	176.36	772.44
VOC	19.29	84.50	0.08	0.35
HAPS	8.00	35.02	0.01	0.04
Gas Heating Value	1,476 Btu/scf			
Hourly Stream Flow	1,188.11 scf/hr			
Annual Stream Flow	10,407,816.12 scf/yr			

Equations Used

- A. (Annual Emissions, tpy) = (Average Hourly Emissions, lb/hr) x (8,760 hr/yr) / (2,000 lb/ton)
B. (Annual Stream Flow, scf/yr) = (Hourly Stream Flow, scf/hr) x (8,760 hr/yr)

Truck Loading

Section 3.7

EPN(s): L-1
FIN(s): L-1
Source Name: Condensate Loading

Total Emissions:

Pollutant	lb/hr	tpy
VOC	57.01	0.06
Crude Oil/ Condensate VOC	57.01	0.06
H ₂ S	0.02	<0.01
Benzene	0.37	<0.01
HAPs	2.78	<0.01

Calculation Basis:

Loading loss emissions are estimated using the methodology in AP-42, Chapter 5, section 5.2-4 (Fifth Edition, June 2008). Saturation factors taken from Table 5.2-1 of AP-42 (Fifth Edition, June 2008).

Liquid and vapor properties for the Condensate are from the BR&E ProMax model included in this document.

Background Information:

Material Loaded:	Condensate
Loadout Volume:	Hourly 8,000 gal/hr
	Annual 22,968 gal/yr
Tank Truck / Mode of Operation:	Submerged Loading: Dedicated Normal Service
Control Device:	Atmosphere
Tank Truck Control Device Capture Efficiency Category:	N/A
Control Device Capture Efficiency:	0.0%
Source of Material Property Data:	ProMax Report

Emission Calculations

Parameter	Note/ Reference	Condensate Loading	
		Hourly Value	Annual Value
Loadout Volume	User-entered	8,000 gal/hr	22,968 gal/yr
Vapor Molecular Weight, M_v	See ProMax Report	44.9 lb/lb-mol	40.5 lb/lb-mol
Vapor Pressure, P_v (@ Bulk Temp)		13.055 psia	9.612 psia
Temperature of Bulk Liquid Loaded, T_B		95.0 °F	66.2 °F
		554.67 °R	525.86 °R
Saturation factor, S	AP-42, Tbl 5.2-1	0.60 (dim)	0.60 (dim)
Loading Loss Emission Rate, L_L	See Eqn. Used	7.9052 lb/Mgal	5.5373 lb/Mgal
Loading Losses	See Eqn. Used	63.24 lb/hr	127.18 lb/yr

Truck Loading

Section 3.7

EPN(s): L-1
FIN(s): L-1
Source Name: Condensate Loading

Equations used:

- A. Loading Loss Emission Rate, (AP-42, Chapter 5.2), $L_L \text{ (lb/Mgal)} = 12.46 \times S \times P_v \times M_v / T_B$
 B. Loading Losses, $lb = L_L \text{ (lb/Mgal)} \times \text{Loadout Volume (gal)} \times \text{Mgal/1,000 gal}$

Total Loading Emissions:

Pollutant	Condensate Loading		
	Wt%	lb/hr	tpy
VOC	90.14%	57.01	0.06
HAPs	4.40%	2.78	2.80E-03
H ₂ S	0.03%	0.02	1.86E-05
Methane (C1)	1.56%	0.98	9.89E-04
Ethane (C2)	7.74%	4.90	4.92E-03
Propane (C3)	25.17%	15.92	0.02
Isobutane (i-C4)	4.84%	3.06	3.08E-03
n-Butane (n-C4)	23.09%	14.60	0.01
Isopentane (i-C5)	9.35%	5.92	0.01
n-Pentane (n-C5)	12.02%	7.60	0.01
Other Hexanes (C6)	1.33%	0.84	8.49E-04
Heptanes (C7)	5.94%	3.76	3.78E-03
Octanes (C8)	3.63%	2.30	2.31E-03
Nonanes (C9)	0.31%	0.19	1.94E-04
Decanes Plus (C10+)	0.06%	0.04	3.81E-05
Benzene	0.59%	0.37	3.75E-04
Toluene	0.34%	0.22	2.18E-04
Ethylbenzene	0.05%	0.03	3.48E-05
Xylenes	0.10%	0.07	6.56E-05
n-Hexane	3.31%	2.09	2.10E-03

Equations used:

- C. Total Loading Emissions per Pollutant, $lb/hr = (\text{Loading Losses, lb/hr}) \times (\text{Pollutant Content, Wt\%})$
 D. Total Loading Emissions per Pollutant, $tpy = (\text{Loading Loss, lb/yr}) \times (\text{Pollutant Content, Wt\%}) / (2,000 \text{ lb/ton})$

Truck Loading

Section 3.8

EPN(s): L-1
FIN(s): L-1
Source Name: Produced Water Loading

Total Emissions:

Pollutant	lb/hr	tpy
VOC	53.43	1.23
Crude Oil/ Condensate VOC	53.43	1.23
H ₂ S	<0.01	<0.01
Benzene	0.31	0.01
HAPs	3.27	0.08

Calculation Basis:

Loading loss emissions are estimated using the methodology in AP-42, Chapter 5, section 5.2-4 (Fifth Edition, June 2008). Saturation factors taken from Table 5.2-1 of AP-42 (Fifth Edition, June 2008).

Liquid and vapor properties for the Produced Water are from the BR&E ProMax model included in this document.

Background Information:

Material Loaded:		Produced Water
Loadout Volume:	Hourly	8,000 gal/hr
	Annual	558,751 gal/yr
Tank Truck / Mode of Operation:		Submerged Loading: Dedicated Normal Service
Control Device:		Atmosphere
Tank Truck Control Device Capture Efficiency Category:		N/A
Control Device Capture Efficiency:		0.0%
Source of Material Property Data:		ProMax Report

Emission Calculations

Parameter	Note/ Reference	Produced Water Loading	
		Hourly Value	Annual Value
Loadout Volume	User-entered	8,000 gal/hr	558,751 gal/yr
Vapor Molecular Weight, M_v	See ProMax Report	52.0 lb/lb-mol	50.0 lb/lb-mol
Vapor Pressure, P_v (@ Bulk Temp)		9.684 psia	6.272 psia
Temperature of Bulk Liquid Loaded, T_B		95.0 °F	66.2 °F
		554.67 °R	525.86 °R
Saturation factor, S	AP-42, Tbl 5.2-1	0.60 (dim)	0.60 (dim)
Loading Loss Emission Rate, L_L	See Eqn. Used	6.7846 lb/Mgal	4.4617 lb/Mgal
Loading Losses	See Eqn. Used	54.28 lb/hr	2,492.98 lb/yr

Truck Loading

Section 3.8

EPN(s): L-1
FIN(s): L-1
Source Name: Produced Water Loading

Equations used:

- A. Loading Loss Emission Rate, (AP-42, Chapter 5.2), $L_L \text{ (lb/Mgal)} = 12.46 \times S \times P_v \times M_v / T_B$
B. Loading Losses, $lb = L_L \text{ (lb/Mgal)} \times \text{Loadout Volume (gal)} \times \text{Mgal}/1,000 \text{ gal}$

Total Loading Emissions:

Pollutant	Produced Water Loading		
	Wt%	lb/hr	tpy
VOC	98.44%	53.43	1.23
HAPs	6.02%	3.27	0.08
H ₂ S	0.00%	8.85E-04	2.03E-05
Methane (C1)	0.25%	0.13	3.08E-03
Ethane (C2)	1.23%	0.67	0.02
Propane (C3)	9.63%	5.23	0.12
Isobutane (i-C4)	4.71%	2.56	0.06
n-Butane (n-C4)	32.11%	17.43	0.40
Isopentane (i-C5)	13.40%	7.27	0.17
n-Pentane (n-C5)	18.96%	10.29	0.24
Other Hexanes (C6)	2.35%	1.28	0.03
Heptanes (C7)	8.41%	4.57	0.10
Octanes (C8)	2.30%	1.25	0.03
Nonanes (C9)	0.44%	0.24	0.01
Decanes Plus (C10+)	0.09%	0.05	1.07E-03
Benzene	0.56%	0.31	0.01
Toluene	0.45%	0.24	0.01
Ethylbenzene	0.08%	0.04	9.61E-04
Xylenes	0.15%	0.08	1.82E-03
n-Hexane	4.78%	2.60	0.06

Equations used:

- C. Total Loading Emissions per Pollutant, $lb/hr = (\text{Loading Losses, } lb/hr) \times (\text{Pollutant Content, Wt\%})$
D. Total Loading Emissions per Pollutant, $tpy = (\text{Loading Loss, } lb/yr) \times (\text{Pollutant Content, Wt\%}) / (2,000 \text{ lb/ton})$

Truck Loading

Section 3.8

EPN(s): PL
FIN(s): PL
Source Name: Pressurized Loading

Total Emissions:

Pollutant	lb/hr	tpy
VOC	0.28	0.05
Crude Oil/ Condensate VOC	0.28	0.05
H ₂ S	<0.01	<0.01
Benzene	<0.01	<0.01
HAPs	0.01	<0.01

Calculation Basis:

Loading loss emissions are estimated using the methodology in AP-42, Chapter 5, section 5.2-4 (Fifth Edition, June 2008). Saturation factors taken from Table 5.2-1 of AP-42 (Fifth Edition, June 2008).

Liquid and vapor properties for the HP-Condensate are from the AP-42 tank calculations included in this document.

Background Information:

Material Loaded:		HP-Condensate
Loadout Volume:	Hourly	0.058 bbl/hr
	Annual	21 bbl/yr
Tank Truck / Mode of Operation:	Submerged Loading: Dedicated Normal Service	
Control Device:	Atmosphere	
Tank Truck Control Device Capture Efficiency Category:	N/A	
Control Device Capture Efficiency:	0.0%	
Source of Material Property Data:	AP-42 Tank Calculations	

Emission Calculations

Parameter	Note/ Reference	HP-Condensate Loading	
		Hourly Value	Annual Value
Loadout Volume	User-entered	2 gal/hr	894 gal/yr
Vapor Molecular Weight, M_v	See AP-42 Tank Calculations	58.99 lb/lb-mol	58.99 lb/lb-mol
Vapor Pressure, P_v (@ Bulk Temp)		84.7 psia	84.7 psia
Loading Losses	See Eqn. Used	0.31 lb/hr	113.09 lb/yr

Equations used:

A. Loading Losses, lb = L_L (lb/hr) X Loadout Volume (gal) / 7.48 gal/scf X PV MV / 14.7 / 359 scf/lbmol

Truck Loading

Section 3.8

EPN(s): PL
FIN(s): PL
Source Name: Pressurized Loading

Total Loading Emissions:

Pollutant	HP-Condensate Loading		
	Wt%	lb/hr	tpy
VOC	90.14%	0.28	0.05
HAPs	4.40%	0.01	2.49E-03
H ₂ S	0.03%	9.06E-05	1.65E-05
Methane (C1)	1.56%	4.82E-03	8.80E-04
Ethane (C2)	7.74%	0.02	4.38E-03
Propane (C3)	25.17%	0.08	0.01
Isobutane (i-C4)	4.84%	0.01	2.74E-03
n-Butane (n-C4)	23.09%	0.07	0.01
Isopentane (i-C5)	9.35%	0.03	0.01
n-Pentane (n-C5)	12.02%	0.04	0.01
Other Hexanes (C6)	1.33%	4.14E-03	7.55E-04
Heptanes (C7)	5.94%	0.02	3.36E-03
Octanes (C8)	3.63%	0.01	2.05E-03
Nonanes (C9)	0.31%	9.46E-04	1.73E-04
Decanes Plus (C10+)	0.06%	1.86E-04	3.39E-05
Benzene	0.59%	1.83E-03	3.33E-04
Toluene	0.34%	1.06E-03	1.94E-04
Ethylbenzene	0.05%	1.69E-04	3.09E-05
Xylenes	0.10%	3.20E-04	5.83E-05
n-Hexane	3.31%	0.01	1.87E-03

- Equations used:
- B. Total Loading Emissions per Pollutant, lb/hr = (Loading Losses, lb/hr) x (Pollutant Content, Wt%)
- C. Total Loading Emissions per Pollutant, tpy = (Loading Loss, lb/yr) x (Pollutant Content, Wt%) / (2,000 lb/ton)

Compressor Blowdowns

Section 3.9

EPN(s): MSS
FIN(s): BLDWN
Source Name: Compressor Blowdowns

Total Emissions:

Pollutant	lb/hr	tpy
VOC	282.47	2.71
H ₂ S	0.02	1.70E-04
Benzene	0.61	0.01
HAPs	7.68	0.07

Calculation Basis:

Compressor blowdown emissions are calculated based on the volume of natural gas released per event, the number of events per hour and per year, and the properties of the natural gas stream.

The molecular weight, heat content, and composition are based on the site-specific sample taken from Charlie Brown - Inlet Gas (sampled on 07/08/2024). Gas Constant is based on Standard Conditions as defined by API (60 °F and 101.325 kPa).

Background Information

Number of Compressors	8	
Actual Volume of Vented Unit	3,223 ft ³ /unit	
Gas Temperature Before Release	120 °F	
	579.67 °R	
Gas Pressure Before Release	20 psig	
	32.0 psia	
Volume Released (per unit)	3,932.24 scf/event/unit	
Hourly Blowdowns (total)	5 event/hr	
Annual Events (per unit)	12 events/yr/unit	
Total Annual Events	96 events/yr	
Basis for Physical Properties of Gas	Charlie Brown - Inlet Gas	
Gas Constant	379.48 scf/lb-mole	
Standard Temperature	60 °F	519.67 °R
Standard Pressure	14.6959 psia	
Molecular Weight	21.73 lb/lb-mole	
Net / Low Heat Value (LHV)	1,244.00 Btu/scf	
Emissions Routed to	Atmosphere	

Compressor Blowdowns

Section 3.9

EPN(s): MSS
FIN(s): BLDWN
Source Name: Compressor Blowdowns

Emissions Calculations:

Parameters	Hourly	Annual
Total Volume Released	19,661.18 scf/hr	377,494.58 scf/yr
Mass Released	1,125.73 lb/hr	21,614.06 lb/yr

Speciated Emissions

Pollutant	Wt%	Emissions	
		lb/hr	tpy
VOC	25.0925%	282.47	2.71
HAPs	0.6820%	7.68	0.07
H ₂ S	0.0016%	0.02	1.70E-04
Propane (C3)	13.3192%	149.94	1.44
Isobutane (i-C4)	1.2933%	14.56	0.14
n-Butane (n-C4)	4.7997%	54.03	0.52
Isopentane (i-C5)	1.1222%	12.63	0.12
n-Pentane (n-C5)	1.3141%	14.79	0.14
Other Hexanes (C6)	0.8111%	9.13	0.09
Heptanes (C7)	1.0895%	12.27	0.12
Octanes (C8)	0.5293%	5.96	0.06
Nonanes (C9)	0.1059%	1.19	0.01
Decanes Plus (C10+)	0.0261%	0.29	2.82E-03
Benzene	0.0538%	0.61	0.01
Toluene	0.0380%	0.43	4.11E-03
Ethylbenzene	0.0097%	0.11	1.05E-03
Xylenes	0.0146%	0.16	1.58E-03
n-Hexane	0.4191%	4.72	0.05
2,2,4-Trimethylpentane	0.1467%	1.65	0.02

Equations used:

- Total Volume Released, scf = (Volume Released per Event, scf/event) x (Total Number of Events)
- Mass Released, lb = (Total Volume Released, scf) x (Molecular Weight, lb/lb-mole) / (Gas Constant at STP, scf/lb-mole)
- Hourly Pollutant Emissions, lb/hr = (Pollutant Content, Wt%) x (Mass Released per Hour, lb/hr)
- Annual Pollutant Emissions, tpy = (Pollutant Content, Wt%) x (Mass Released per Year, lb/yr) / (2,000 lb/ton)

MSS Equipment Maintenance

Section 3.10

EPN(s): MSS
FIN(s): MSS
Source Name: Piping from Skid to Comp BD

Total Emissions:

Pollutant	lb/hr	tpy
VOC	19.38	0.08
Natural Gas VOC	19.38	0.08
H ₂ S	1.21E-03	4.85E-06
Benzene	0.04	1.66E-04
HAPs	0.53	2.11E-03

Calculation Basis:

Equipment maintenance emissions are calculated based on the volume of natural gas released per event, the number of events per hour and per year, and the properties of the natural gas stream.

The molecular weight, heat content, and composition are based on the site-specific sample taken from Charlie Brown - Inlet Gas (sampled on 07/08/2024). Gas Constant is based on Standard Conditions as defined by API (60 °F and 101.325 kPa).

Background Information

Vessel/Equipment Type	Vessel	
Number of Units	8	
Max Volume Released (per unit)	168.62	scf/event/unit
Average Volume Released (per unit)	168.62	scf/event/unit
Hourly Blowdowns (total)	8	event/hr
Duration of Each Event	1	hour
Annual Events (per unit)	1	event/yr/unit
Total Annual Events	64	events/yr
Basis for Physical Properties of Gas	Charlie Brown - Inlet Gas	
Gas Constant	379.48	scf/lb-mole
Molecular Weight	21.73	lb/lb-mole
Net / Low Heat Value (LHV)	1,244.00	Btu/scf
Emissions Routed to	Atmosphere	

Emissions Calculations:

Parameters	Vessel Blowdowns	
	Hourly	Annual
Total Volume Released	1,348.96 scf/hr	10,791.68 scf/yr
Mass Released	77.24 lb/hr	617.90 lb/yr

MSS Equipment Maintenance

Section 3.10

EPN(s): MSS
FIN(s): MSS
Source Name: Piping from Skid to Comp BD

Speciated Emissions

Pollutant	Wt%	lb/hr	tpy
VOC	25.0925%	19.38	0.08
HAPs	0.6820%	0.53	2.11E-03
H2S	0.0016%	1.21E-03	4.85E-06
Propane (C3)	13.3192%	10.29	0.04
Isobutane (i-C4)	1.2933%	1.00	4.00E-03
n-Butane (n-C4)	4.7997%	3.71	0.01
Isopentane (i-C5)	1.1222%	0.87	3.47E-03
n-Pentane (n-C5)	1.3141%	1.02	4.06E-03
Other Hexanes (C6)	0.8111%	0.63	2.51E-03
Heptanes (C7)	1.0895%	0.84	3.37E-03
Octanes (C8)	0.5293%	0.41	1.64E-03
Nonanes (C9)	0.1059%	0.08	3.27E-04
Decanes Plus (C10+)	0.0261%	0.02	8.07E-05
Benzene	0.0538%	0.04	1.66E-04
Toluene	0.0380%	0.03	1.18E-04
Ethylbenzene	0.0097%	0.01	3.01E-05
Xylenes	0.0146%	0.01	4.51E-05
n-Hexane	0.4191%	0.32	1.29E-03
2,2,4-Trimethylpentane	0.1467%	0.11	4.53E-04

Equations used:

- A. Total Volume Released, scf = (Volume Released per Event, scf/event) x (Total Number of Events)
- B. Mass Released, lb = (Total Volume Released, scf) x (Molecular Weight, lb/lb-mole) / (Gas Constant at STP, scf/lb-mole)
- C. Hourly Pollutant Emissions, lb/hr = (Pollutant Content, Wt%) x (Mass Released per Hour, lb/hr)
- D. Annual Pollutant Emissions, tpy = (Pollutant Content, Wt%) x (Mass Released per Year, lb/yr) / (2,000 lb/ton)

MSS Equipment Maintenance

Section 3.10

EPN(s): MSS
FIN(s): VSL-BD
Source Name: Dehydrator Blowdowns

Total Emissions:

Pollutant	lb/hr	tpy
VOC	692.21	0.69
Natural Gas VOC	692.21	0.69
H ₂ S	0.04	4.33E-05
Benzene	1.48	1.48E-03
HAPs	18.81	0.02

Calculation Basis:

Equipment maintenance emissions are calculated based on the volume of natural gas released per event, the number of events per hour and per year, and the properties of the natural gas stream.

The molecular weight, heat content, and composition are based on the site-specific sample taken from Charlie Brown - Inlet Gas (sampled on 07/08/2024). Gas Constant is based on Standard Conditions as defined by API (60 °F and 101.325 kPa).

Background Information

Vessel/Equipment Type	Vessel	
Number of Units	2	
Max Volume Released (per unit)	48,180.00	scf/event/unit
Average Volume Released (per unit)	48,180.00	scf/event/unit
Hourly Blowdowns (total)	1	event/hr
Duration of Each Event	1	hour
Annual Events (per unit)	1	event/yr/unit
Total Annual Events	2	events/yr
Basis for Physical Properties of Gas	Charlie Brown - Inlet Gas	
Gas Constant	379.48	scf/lb-mole
Molecular Weight	21.73	lb/lb-mole
Net / Low Heat Value (LHV)	1,244.00	Btu/scf
Emissions Routed to	Atmosphere	

Emissions Calculations:

Parameters	Vessel Blowdowns	
	Hourly	Annual
Total Volume Released	48,180.00 scf/hr	96,360.00 scf/yr
Mass Released	2,758.62 lb/hr	5,517.25 lb/yr

MSS Equipment Maintenance

Section 3.10

EPN(s): MSS
FIN(s): VSL-BD
Source Name: Dehydrator Blowdowns

Speciated Emissions

Pollutant	Wt%	lb/hr	tpy
VOC	25.0925%	692.21	0.69
HAPs	0.6820%	18.81	0.02
H2S	0.0016%	0.04	4.33E-05
Propane (C3)	13.3192%	367.43	0.37
Isobutane (i-C4)	1.2933%	35.68	0.04
n-Butane (n-C4)	4.7997%	132.41	0.13
Isopentane (i-C5)	1.1222%	30.96	0.03
n-Pentane (n-C5)	1.3141%	36.25	0.04
Other Hexanes (C6)	0.8111%	22.38	0.02
Heptanes (C7)	1.0895%	30.06	0.03
Octanes (C8)	0.5293%	14.60	0.01
Nonanes (C9)	0.1059%	2.92	2.92E-03
Decanes Plus (C10+)	0.0261%	0.72	7.20E-04
Benzene	0.0538%	1.48	1.48E-03
Toluene	0.0380%	1.05	1.05E-03
Ethylbenzene	0.0097%	0.27	2.69E-04
Xylenes	0.0146%	0.40	4.03E-04
n-Hexane	0.4191%	11.56	0.01
2,2,4-Trimethylpentane	0.1467%	4.05	4.05E-03

Equations used:

- A. Total Volume Released, scf = (Volume Released per Event, scf/event) x (Total Number of Events)
- B. Mass Released, lb = (Total Volume Released, scf) x (Molecular Weight, lb/lb-mole) / (Gas Constant at STP, scf/lb-mole)
- C. Hourly Pollutant Emissions, lb/hr = (Pollutant Content, Wt%) x (Mass Released per Hour, lb/hr)
- D. Annual Pollutant Emissions, tpy = (Pollutant Content, Wt%) x (Mass Released per Year, lb/yr) / (2,000 lb/ton)

MSS Pipeline Pigging Activities

Section 3.11

EPN(s): MSS
FIN(s): PIG
Source Name: Pigging and Purging

Total Emissions:

Pollutant	lb/hr	tpy
VOC	33.96	0.88
Natural Gas VOC	33.96	0.88
H ₂ S	2.12E-03	5.52E-05
Benzene	0.07	1.89E-03
HAPs	0.92	0.02

Calculation Basis:

Pipeline pigging emissions resulting from pipeline maintenance are calculated based on the volume of pig launcher/receiver degassed at the specified pipeline pressure, the number of events per hour and per year, and the properties of the natural gas stream (all of which are indicated in the background information below).

The molecular weight, heat content, and composition are based on the site-specific sample taken from Charlie Brown - Inlet Gas (sampled on 07/08/2024). Gas Constant is based on Standard Conditions as defined by API (60 °F and 101.325 kPa).

Background Information

Number of Pig Launchers/Receivers	1
Volume of Launcher/Receiver (per unit)	2,400.00 ft ³ /unit
Hourly Events (total)	1 event/hr
Duration of Each Event	1 hour
Annual Events (per unit)	52 event/yr/unit
Total Annual Events	52 events/yr
Basis for Physical Properties of Gas	Charlie Brown - Inlet Gas
Release Temperature	68 °F
	527.67 °R
Release Pressure	0 psig
	14.7 psia
Gas Constant	379.48 scf/lb-mole
Standard Temperature	60 °F 519.67 °R
Standard Pressure	14.6959 psia
Volume Released (per event)	2,363.6136 scf/event
Molecular Weight	21.73 lb/lb-mole
Net / Low Heat Value (LHV)	1,244.00 Btu/scf
Emissions Routed to	Atmosphere

Emissions Calculations:

Parameters	Hourly	Annual
Total Volume Released	2,363.61 scf/hr	122,907.91 scf/yr
Mass Released	135.33 lb/hr	7,037.29 lb/yr

MSS Pipeline Pigging Activities

Section 3.11

EPN(s): MSS
FIN(s): PIG
Source Name: Pigging and Purging

Speciated Emissions

Pollutant	Wt%	Emissions	
		lb/hr	tpy
VOC	25.0925%	33.96	0.88
HAPs	0.6820%	0.92	0.02
H ₂ S	0.0016%	2.12E-03	5.52E-05
Propane (C3)	13.3192%	18.03	0.47
Isobutane (i-C4)	1.2933%	1.75	0.05
n-Butane (n-C4)	4.7997%	6.50	0.17
Isopentane (i-C5)	1.1222%	1.52	0.04
n-Pentane (n-C5)	1.3141%	1.78	0.05
Other Hexanes (C6)	0.8111%	1.10	0.03
Heptanes (C7)	1.0895%	1.47	0.04
Octanes (C8)	0.5293%	0.72	0.02
Nonanes (C9)	0.1059%	0.14	3.73E-03
Decanes Plus (C10+)	0.0261%	0.04	9.19E-04
Benzene	0.0538%	0.07	1.89E-03
Toluene	0.0380%	0.05	1.34E-03
Ethylbenzene	0.0097%	0.01	3.43E-04
Xylenes	0.0146%	0.02	5.14E-04
n-Hexane	0.4191%	0.57	0.01
2,2,4-Trimethylpentane	0.1467%	0.20	0.01

Equations used:

- A. Total Volume Released, scf = (Volume Released per Event, scf/event) x (Total Number of Events)
- B. Mass Released, lb = (Total Volume Released, scf) x (Molecular Weight, lb/lb-mole) / (Gas Constant at STP, scf/lb-mole)
- C. Hourly Pollutant Emissions, lb/hr = (Pollutant Content, Wt%) x (Mass Released per Hour, lb/hr)
- D. Annual Pollutant Emissions, tpy = (Pollutant Content, Wt%) x (Mass Released per Year, lb/yr) / (2,000 lb/ton)

MSS Tank Maintenance

Section 3.12

EPN(s): MSS
FIN(s): TM
Source Name: Tank Maintenance

Total Emissions:

Pollutant	lb/hr	tpy
VOC	1.90	0.03
Crude Oil/ Condensate VOC	1.90	0.03
H ₂ S	6.15E-04	1.05E-05
Benzene	0.01	2.11E-04
HAPs	0.09	1.57E-03

Calculation Basis:

This MSS activity includes the depressurization and opening of storage tanks to atmosphere. Emissions degassed and vented to atmosphere from opening the vessel are calculated using the Ideal Gas Law and are based on the entire equipment volume venting to the atmosphere at the opening concentration. It is assumed that only one tank would be degassed and opened at a time.

Liquid and vapor properties for the stored material are from the BR&E ProMax model included in this document.

Background Information:

Vessel Parameters

Equipment Type	Storage Tanks
Basis for Parameters	ProMax Report
Number of Vessels	2
Vessel Capacity	210 bbl
Vessel Height	15.0 ft
Vessel Diameter	10.0 ft
Equipment Pressure	0.3 psig
Vapor Space Volume	1,178.10 ft ³

Stored Material Parameters

Vapor Molecular Weight	13.06 lb/lb-mol
Liquid Density [1]	62.40 lb/ft ³
Maximum Temperature	100.00 °F
	559.67 °R
Ideal Gas Constant	10.73159 (ft ³ •psia)/(°R•lb-mol)

MSS Event Parameters

Atmospheric Pressure	13.26 psia
Duration of event	24 hr/event
Annual Events Per Vessel	1 event/yr
Total Events Per Year	2 events/yr
Clingage Thickness [2]	0.0004 inches
	0.000033 ft
Clingage Volume	0.0183 ft ³
Emissions Routed to	Atmosphere

MSS Tank Maintenance

Section 3.12

EPN(s): MSS
FIN(s): TM
Source Name: Tank Maintenance

Emissions Calculations:

Total Mass Rate per Event	Storage Tanks		
	lb/event	lb/hr	tpy
Equipment Depressurization	0.64	0.64	6.40E-04
Vessel Clingage	1.14	0.05	1.14E-03
Equipment Opening	33.96	1.41	0.03
Total Degassing Mass Rate	35.74	2.10	0.04

Speciated Emissions:

Pollutant	Vapor Wt %	lb/hr	tpy
VOC	90.14%	1.90	0.03
HAPs	4.40%	0.09	1.57E-03
H2S	0.03%	6.15E-04	1.05E-05
Benzene	0.59%	0.01	2.11E-04

Notes:

- [1] Liquid density for water is used as a surrogate since the density of each condensate sample is not available and will vary over time.
- [2] Clingage thickness per TCEQ Maintenance, Startup and Shutdown (MSS) Guidance Document for terminals and chemical plants. MSS Guidance, 09/07/2012, Version 3

Equations used:

- A. Vapor Space Volume, $\text{ft}^3 = (\text{Vessel Height, ft}) \times \pi \times (\text{Vessel Diameter, ft})^2 / 4$
- B. Clingage Volume, $\text{ft}^3 = (\text{Clingage Thickness, ft}) \times \{ [\pi \times (\text{Vessel Diameter, ft})^2 / 4] + [\pi \times (\text{Vessel Diameter, ft}) \times (\text{Vessel Height, ft})] \}$
- C. Equipment Depressurization (lb/event) = (Pressure Difference, psia) X (Equipment Volume, ft^3) / (Gas Constant, $[\text{ft}^3 \cdot \text{psia} / ^\circ\text{R} \cdot \text{lb-mol}]$) / (Temperature, $^\circ\text{R}$) X (MW, lb/lb-mol) / (hours/event)
- D. Vessel Clingage (lb/hr) = (Clingage Volume, ft^3) X (Liquid Density, lb/ ft^3) / (Duration of Event, hr/event)
- E. Equipment Opening (lb/hr) = (Atmospheric Pressure, psia) X (Equipment Volume, ft^3) / (Gas Constant, $[\text{ft}^3 \cdot \text{psia} / ^\circ\text{R} \cdot \text{lb-mol}]$) / (Temperature, $^\circ\text{R}$) X (MW, lb/lb-mol) / (hours/event)
- F. Mass Emissions per Event (tpy) = (Total Mass Vented per Event, lb) X (Total Events Per Year) / (2,000 lb/ton)
- G. Total Degassing Emissions per Pollutant, lb/hr = (Degassing Emissions, lb/hr) X (Pollutant Content, Wt%)
- H. Total Degassing Emissions per Pollutant, tpy = (Degassing Emissions, tpy) X (Pollutant Content, Wt%)

Painting and Blasting Operations

Section 3.13

EPN(s): SCAB
FIN(s): SCAB
Source Name: Surface Coating & Blasting

Total Emissions:

Pollutant	lb/hr	tpy
VOC	0.08	0.35
PM _{TOTAL/10/2.5}	0.13	0.01
PM ₁₀	0.13	0.01
PM _{2.5}	0.02	1.78E-03

Calculation Basis:

The planned MSS activities and associated calculations represented here are taken from the TCEQ oil and gas emissions spreadsheet (revised 10/2/2014). These default values conservatively estimate emissions from typical planned MSS activities that may occur at the site. Emissions from painting and blasting operations (as outlined in 30 TAC 106.359(b)) are intended to represent potential emissions from these activities and should not be interpreted as an authorization claim under 30 TAC §106.359 unless explicitly stated in this document.

Additionally, not all activities represented below occur at this site, and MSS activities not specifically represented here may occur; however, the emission limits of the permit will not be exceeded. The basis of the example emission calculation (such as volume, concentration, pressure) are example conditions and should not be interpreted as representations of a specific facility or activity condition under 30 TAC §116.116(a). Individual activities in this MSS category which are performed may have slight variations in procedure or equipment configuration.

MSS Descriptions and Input Parameters

MSS Activity	§106.359 Paragraph	MSS Activity Description - Emissions associated with:	Input Parameters	
Aerosol Cans	(b)(2)	Includes spray paints and primers, decreaseers, cleaners, other solvents, and rust inhibitors (where VOC is a propellant). Lubricants not included.	16oz cans used/yr	100
			VOC Content (lb/can)	0.9
Manual Paint Application	(b)(2)	Includes non-spray application of touch up paint/primer. Assumes 100% evaporation rate of VOC. TCEQ survey of MSDS sheets indicates VOC content varies from 2 to 7 lb/gallon. As Chapter 115 limits VOC content to 3.5 lb/gal in nonattainment areas this was used as a conservative amount.	Paint used (gal/yr)	100
			VOC Content (lb/gal)	3
Spray Painting	(b)(2)	Includes spray application of paint/primer. Assumes 100% evaporation rate of VOC. TCEQ survey of MSDS sheets indicates VOC content varies from 2 to 7 lb/gallon. As Chapter 115 limits VOC content to 3.5 lb/gal in nonattainment areas this was used as a conservative amount.	Paint used (gal/yr)	100
			VOC Content (lb/gal)	3
Sandblasting	(b)(2)	Per industry expertise and BMP, blasting occurs for 5 days per year and 8 hrs per day. Emission factor for PM ₁₀ based on TCEQ Abrasive Blast Cleaning technical guidance document. Emission factor for PM _{2.5} is based on 15% of PM ₁₀ emission factor.	Application Rate (lb/hr)	375
			Annual Hours of Blasting Operations	40

Painting and Blasting Operations

Section 3.13

EPN(s): SCAB
FIN(s): SCAB
Source Name: Surface Coating & Blasting

Emission Calculations:

MSS Activity	Parameters and Emission Factors		Pollutant	Calculated Value	Emissions tpy
Aerosol Cans (b)(2)	Standard Industrial Size Can	16 oz	VOC	90.00 lb/yr	0.05
	VOC Content	0.9 lb/can			
	Number of Cans Used/Yr	100			
Non-spray Paint Application (b)(2)	Paint Used	100 gal/yr	VOC	300.00 lb/yr	0.15
	VOC Content	3.00 lb/gal			
Spray Painting (b)(2)	Paint Used	100 gal/yr	VOC	300.00 lb/yr	0.15
	VOC Content	3.00 lb/gal			
	PM _{10/2.5} Content	8.00 lb/gal	PM	53.20 lb/yr	0.03
	PM _{10/2.5} Transfer Efficiency	65%	PM ₁₀	16.80 lb/yr	0.01
	Droplet Factor - PM ₁₀ Overspray	81%			
	Droplet Factor - PM ₁₀ Overspray	94%	PM _{2.5}	2.80 lb/yr	1.40E-03
	Droplet Factor - PM _{2.5} Overspray	99%			
Sandblasting (b)(2)	Application Rate	375.0 lb/hr	PM ₁₀	0.13 lb/hr	2.55E-03
	Annual Blasting Operation	40 hr/yr			
	Emission Factor - PM ₁₀	0.00034 lb/lb of usage	PM _{2.5}	0.02 lb/hr	3.75E-04
	Emission Factor - PM _{2.5}	0.00005 lb/lb of usage			

Emission Rates

Pollutant	Pollutant Wt.% ^[1]	lb/hr	tpy
VOC	100.00%	0.08	0.35
PM _{TOTAL/10/2.5}	N/A	0.13	0.03
PM ₁₀	N/A	0.13	0.01
PM _{2.5}	N/A	0.02	1.78E-03

[1] Composition is conservatively based on 100% VOC.

Equations used:

- A. VOC Usage, lb/yr = (VOC Content, lb/gal or can) x (Number of gallons or cans used per year)
- B. PM Usage, lb/yr = (PM Content, lb/gal) X (Number of gallons used per year) X (100% - PM Transfer Efficiency) X (100% - PM Overspray)
- C. Hourly Pollutant Emissions, lb/hr = (Pollutant Usage, lb/yr) / (8,760 hr/yr)
- D. Annual Pollutant Emissions, tpy = (Pollutant Usage, lb/yr) / (2,000 lb/ton)

Miscellaneous MSS Activities

Section 3.14

EPN(s): MSS
FIN(s): MSS-MISC
Source Name: Miscellaneous MSS Activities

Total Emissions:

Pollutant	lb/hr	tpy
VOC	0.06	0.25
HAPs	2.85E-03	0.01

Calculation Basis:

The planned MSS activities and associated calculations represented here are taken from the TCEQ oil and gas emissions spreadsheet (revised 10/2/2014). These default values conservatively estimate emissions from typical planned MSS activities that may occur at the site. Emissions from miscellaneous activities (as outlined in 30 TAC 106.359(b)) are intended to represent potential emissions from miscellaneous activities and should not be interpreted as an authorization claim under 30 TAC §106.359 unless explicitly stated in this document.

Additionally, not all activities represented below occur at this site, and MSS activities not specifically represented here may occur; however, the emission limits of the permit will not be exceeded. The basis of the example emission calculation (such as volume, concentration, pressure) are example conditions and should not be interpreted as representations of a specific facility or activity condition under 30 TAC §116.116(a). Individual activities in this MSS category which are performed may have slight variations in procedure or equipment configuration.

MSS Descriptions and Input Parameters

MSS Activity	§106.359 Paragraph	MSS Activity Description - Emissions associated with:	Input Parameters	
Engine Oil changes / Filter Changes	(b)(1)	Engine oil/filter change occur during the draining of the used engine oil into oil pan.	Number of Engine/Turbines	8
			Annual Activities	10
Engine Rod Packing Changes	(b)(1), (b)(4)	Changing of the rod would be from clingage of lubricant in the casing.	Annual Activities	10
Engine Wet / Dry Seal Changes	(b)(3)	Changing seals would be from clingage of lubricant in the casing.	Annual Activities	2
Glycol dehydration unit	(b)(2)	Replacement of glycol solution used in dehydration unit (contactor and regenerator).	No. of Dehy units	2
			Annual Activities	1
Aerosol Lubricants	(b)(2)	Lubrication of site process equipment.	16oz cans used/yr	100
Piping Components	(b)(3)	Replacement of piping components (based on 100 ft pipe length).	No. of pipes	10
			Activities/year	1
Calibration	(b)(2)	Calibration of site process equipment.	No. of cylinders	1

Miscellaneous MSS Activities

Section 3.14

EPN(s): MSS
FIN(s): MSS-MISC
Source Name: Miscellaneous MSS Activities

Emission Calculations:

MSS Activity	Default Parameters		Equation Used	Calculated Value	Emissions tpy	
Engine Oil Changes/ Filter Changes (b)(1)	Temperature, T	212 °F	Loading Loss, L_L	0.0093 lb/Mgal	0.08	
	Vapor Pressure, P_V	0.001 psia				
	Saturation Factor, S	1.0 (dimensionless)				
	Molecular Weight, M_W	500 lb/lb-mol				
	Motor Oil Usage	112 gal/activity				
	wind speed, U	3.52 m/s	Evaporation Loss, L_E	0.001 lb/activity		
	Vapor Pressure, P_V	10.0 Pa				
	Surface Area, A_p	1.48 m²				
	Evaporation time, t	10 hours				
	Safety Factor-large HP eng	2.0 (dimensionless)				Total
Engine Rod Packing Changes (b)(1) & (b)(4)	Temperature, T	104 °F	Clingage Loss, LSL_{max}	0.00012 lb/activity	4.67E-06	
	Vapor Pressure, P_V	0.001 psia				
	Saturation Factor, S	0.60 (dim)				
	Molecular Weight, M_W	500 lb/lb-mol				
	Ideal Gas Constant, R	10.73159 psia ft³/lb-mole °R				
	Casing Volume, V_V	2.355 ft³	Total	0.0012 lb/yr/engine		
Engine Wet / Dry Seal Changes (b)(3)	Temperature, T	104 °F	Clingage Loss, LSL_{max}	0.00012 lb/activity	9.34E-07	
	Vapor Pressure, P_V	0.001 psia				
	Saturation Factor, S	0.60 (dim)				
	Molecular Weight, M_W	500 lb/lb-mol				
	Ideal Gas Constant, R	10.73159 psia ft³/lb-mole °R				
	Casing Volume, V_V	2.355 ft³	Total	0.0002 lb/yr/engine		
Glycol Dehydration Unit (b)(2)	Temperature, T	68 °F	Loading Loss, L_L	0.0015 lb/Mgal	2.14E-05	
	Vapor Pressure, P_V	0.001 psia		0.006 lb/activity		
	Saturation Factor, S	1.0 (dimensionless)		Clingage Loss, LSL_{max}		
	Glycol solution	4,000 gal/activity	0.015 lb/activity			
	Vessel Volume, V_V	2,355 ft³	Total			0.0214 lb/yr/unit
	Ideal Gas Constant, R	10.73159 psia ft³/lb-mole °R				
	Molecular Weight, M_W	62.07 lb/lb-mol				
Aerosol Lubricants (b)(2)	WD-40 Aerosol Lubricant <i>based on 16oz can</i>	45-50 wt% VOC volatilizes	Emissions	0.5 lb/can	0.03	
Piping Components (b)(3)	Temperature, T	100 °F	Clingage Loss, LSL_{max}	5.434 lb/activity	0.03	
	Vapor Pressure, P_V	10.5 psia				
	Saturation Factor, S	0.60 (dim)				
	Molecular Weight, M_W	66 lb/lb-mol				
	Ideal Gas Constant, R	10.73159 psia ft³/lb-mole °R				
	Vessel Volume, V_V	78.5 ft³	Total	5.4345 lb/yr/unit		
Calibration (b)(2)	Pounds of pentane in one cylinder of calibration gas	Assumed typical cylinder of calibration gas (pentane) contains 100 lb	Total	100 lb pentane/cylinder	0.05	
Miscellaneous (b)(6)	Safety factor to account for MSS activities with the same character and quantity of emissions as those listed in paragraphs (b) (1) - (5) of §106.359.				135.53%	

Miscellaneous MSS Activities

Section 3.14

EPN(s): MSS
FIN(s): MSS-MISC
Source Name: Miscellaneous MSS Activities

Emission Rates

Pollutant	Pollutant Wt. % ^[1]	lb/hr	tpy
VOC	100.00%	0.06	0.25
HAPs	5.00%	2.85E-03	0.01

[1] Composition is conservatively based on 100% VOC.

Equations used:

- A. Loading Loss Emission Rate, **L_L**, lb/Mgal
AP-42, Chapter 5.2, Equation 1

$$L_L = 12.46 \times \frac{S P_V M_V}{T_B}$$
- B. Ideal Gas Law: $n = PV/RT$

$$\text{Total Emissions} = \frac{P_V V_V}{R T} \times M_W \times \text{Concentration (Wt\%)}$$
- C. Evaporative Loss Equation, **L_E**
Reference: Ajay Kumar, N.S. Vatcha, and John Schmelzle, "Estimate Emissions from Atmospheric Releases of Hazardous Substances," Environmental Engineering World, November-December 1996.

$$L_E = 4.14 \times 10^{-5} \times U \times 0.78 \times P_V \times M_W \times 0.67 \times A_p \times 0.94 \times t$$
- D. Clingage Loss Equation, **LSL_{max}**
AP-42, Ch. 7, Equation 3-14
(Constrained by an upper limit = filling loss for IFR w/liquid heel)

$$LSL_{max} = 0.60 \times \frac{P_V V_V}{R T} \times M_W$$

where:
S = Saturation Factor - AP-42, Table 5.2-1
P_V = True Vapor Pressure (psia)
M_W = Molecular weight (lb/lb-mol)
T = Standard Temperature (°R)
A_p = liquid surface area (m²)
t = time (hrs)
V_V = Vessel Volume (ft³)

Impacts Analysis

Impacts Evaluation

Section 4.1

The site demonstrates compliance with the requirements of paragraph (k) of the NRSP for impacts evaluations. Compliance demonstrations with the benzene effects screening level (ESL), the Texas State Property Line Standard (Residential) for H₂S, and the SO₂ and NO₂ National Ambient Air Quality Standard (NAAQS) emission limitations have been provided, as necessary. As specified by in paragraph (k) and illustrated in Project Compliance Analysis table below, if an off-site receptor or property line is greater than one mile from the Site, no further ambient air quality analysis is required for a State Health Effects Evaluation. In addition, if project total emissions are less than the emission thresholds in (k)(3)(C), no additional analysis or demonstration of the specified contaminant is required.

The evaluation was conducted in accordance with the method outlined in paragraph (k)(6)(A) of the NRSP. The site-wide total emission rates are below the calculated maximum hourly and annual emissions (E_{MAX}) for the project sources included in this application. The project sources also represent the site-wide sources and no additional sources need to be included for evaluation of site-wide impacts.

Project Compliance Analysis

Air Contaminant	Project Emission Increases (lb/hr)	(k)(3)(C) Demonstration Limit (lb/hr)	Project Emissions Less Than Limit?	Applicable Distance for Compliance Demonstration	Actual Distance (ft)	Distance for Exemption (ft)	Distance Qualifies for Exemption ?	Further Compliance Demonstration Required?
Benzene	3.010	0.039	No	Nearest receptor	≥ 5,000	5,280	No	Yes
H ₂ S	0.090	0.025	No	Nearest property line	≥ 50	5,280	No	Yes
SO ₂	-9.00E-02	2.00	Yes	Nearest property line	≥ 50	5,280	No	No
NOx	-4.15E+01	4.00	Yes	Nearest property line	≥ 50	5,280	No	No

Impacts Evaluation Parameters

Section 4.2

Impacts by Source:

EPN	Emission Source	Rating ValueUnits		Annual Operation hr/yr	Stack Height ft	Distance to Property Line ft	Distance to Receptor ft	Modeled Emission Rate lb/hr	TCEQ Generic Modeling Table Category	Stack Diameter ft	Exit Velocity ft/sec	Exit Temp °F	Unit Impact Multiplier, G	
													(@ Receptor) G _{HOURLY} ^[1] (µg/m³/lb/hr)	(@Property Line) G _{HOURLY} ^[1] (µg/m³/lb/hr)
CM-1	Caterpillar 3516J Compressor Engine	1,380	hp	8,760	25.0	≥ 50	≥ 5,000	1.0	N/A (from SCREEN3)	1.0	112.0	832.0	--	--
CM-2	Caterpillar 3516J Compressor Engine	1,380	hp	8,760	25.0	≥ 50	≥ 5,000	1.0	N/A (from SCREEN3)	1.0	112.0	832.0	--	--
CM-3	Caterpillar 3516J Compressor Engine	1,380	hp	8,760	25.0	≥ 50	≥ 5,000	1.0	N/A (from SCREEN3)	1.0	112.0	832.0	--	--
CM-4	Caterpillar 3516J Compressor Engine	1,380	hp	8,760	25.0	≥ 50	≥ 5,000	1.0	N/A (from SCREEN3)	1.0	112.0	832.0	--	--
CM-5	Caterpillar 3516J Compressor Engine	1,380	hp	8,760	25.0	≥ 50	≥ 5,000	1.0	N/A (from SCREEN3)	1.0	112.0	832.0	--	--
CM-6	Caterpillar 3516J Compressor Engine	1,380	hp	8,760	25.0	≥ 50	≥ 5,000	1.0	N/A (from SCREEN3)	1.0	112.0	832.0	--	--
CM-10	Caterpillar 3516J Compressor Engine	1,380	hp	8,760	25.0	≥ 50	≥ 5,000	1.0	N/A (from SCREEN3)	1.0	112.0	832.0	--	--
CM-11	Caterpillar 3516 Compressor Engine	1,085	hp	8,760	25.0	≥ 50	≥ 5,000	1.0	N/A (from SCREEN3)	1.0	91.1	863.0	--	--
GEN-1	PSI Industrial 8.8L	245	hp	100	12.0	≥ 50	≥ 5,000	1.0	N/A (from SCREEN3)	0.7	35.1	500.0	--	--
GEN-2	PSI Industrial 8.8L	245	hp	100	12.0	≥ 50	≥ 5,000	1.0	N/A (from SCREEN3)	0.7	35.1	500.0	--	--
TK-1	Pressurized Condensate Tank	60,000	gal	8,760	N/A	≥ 50	≥ 5,000	1.0	Process Vessel				--	--
TK-2	Condensate Tank	210	bbl	8,760	15.0	≥ 50	≥ 5,000	1.0	Tank Hatch				16.20	183.00
TK-3	Produced Water Tank	210	bbl	8,760	15.0	≥ 50	≥ 5,000	1.0	Tank Hatch				16.20	183.00
TK-4	Methanol Tank	2,000	gal	8,760	N/A	≥ 50	≥ 5,000	1.0	Tank Hatch				--	--
TK-5	Lube Oil Tank	2,000	gal	8,760	N/A	≥ 50	≥ 5,000	1.0	Tank Hatch				--	--
TK-6	Antifreeze Tank	1,000	gal	8,760	N/A	≥ 50	≥ 5,000	1.0	Tank Hatch				--	--
TK-7	Triethylene Glycol Tank	740	gal	8,760	N/A	≥ 50	≥ 5,000	1.0	Tank Hatch				--	--
TK-8	Methanol Tank	2,000	gal	8,760	N/A	≥ 50	≥ 5,000	1.0	Tank Hatch				--	--
TK-9	Lube Oil Tank	2,000	gal	8,760	N/A	≥ 50	≥ 5,000	1.0	Tank Hatch				--	--
TK-10	Antifreeze Tank	1,000	gal	8,760	N/A	≥ 50	≥ 5,000	1.0	Tank Hatch				--	--
TK-11	Triethylene Glycol Tank	740	gal	8,760	N/A	≥ 50	≥ 5,000	1.0	Tank Hatch				--	--
HTR-1	Glycol Heater	1	MMBtu/hr	8,760	20.0	≥ 50	≥ 5,000	1.0	N/A (from SCREEN3)	3.1	29.0	600.0	--	--
HTR-2	Glycol Heater	1	MMBtu/hr	8,760	20.0	≥ 50	≥ 5,000	1.0	N/A (from SCREEN3)	3.1	29.0	600.0	--	--
DEHY-1	Glycol Heater/Glycol Dehy Unit 1	N/A	N/A	8,760	12.0	≥ 50	≥ 5,000	1.0	Process Vessel				23.60	408.80
DEHY-2	Glycol Heater/Glycol Dehy Unit 2	N/A	N/A	8,760	12.0	≥ 50	≥ 5,000	1.0	Process Vessel				23.60	408.80
FUG-1	Piping Component Fugitives	N/A	N/A	8,760	3.0	≥ 50	≥ 5,000	1.0	Fugitive				13.20	2,625.00

Impacts Evaluation Parameters

Section 4.2

L-1	Condensate Loading	N/A N/A	8,760	12.0	≥ 50	≥ 5,000	1.0	Loading				16.80	739.20
L-1	Produced Water Loading	N/A N/A	8,760	12.0	≥ 50	≥ 5,000	1.0	Loading				16.80	739.20
MSS	Compressor Blowdowns	N/A N/A	480	12.0	≥ 50	≥ 5,000	1.0	High Pressure (≥30 psig) Blowdowns, Purging, and Pigging				12.00	25.00
MSS	Piping from Skid to Comp BD	N/A N/A	64	12.0	≥ 50	≥ 5,000	1.0	Low Pressure (<30 psig) Blowdowns, Purging, and Pigging				27.80	681.60
MSS	Dehydrator Blowdowns	N/A N/A	2	12.0	≥ 50	≥ 5,000	1.0	High Pressure (≥30 psig) Blowdowns, Purging, and Pigging				12.00	25.00
MSS	Pigging and Purging	N/A N/A	52	6.0	≥ 50	≥ 5,000	1.0	High Pressure (≥30 psig) Blowdowns, Purging, and Pigging				17.00	51.00
MSS	Tank Maintenance	N/A N/A	48	15.0	≥ 50	≥ 5,000	1.0	Low Pressure (<30 psig) Blowdowns, Purging, and Pigging				27.50	517.50
MSS	Miscellaneous MSS Activities	N/A N/A	100	3.0	≥ 50	≥ 5,000	1.0	Low Pressure (<30 psig) Blowdowns, Purging, and Pigging				29.00	4,304.00

Notes:

[1] Hourly Unit Impact Multipliers (G_{HOURLY}) are from SCREEN3 modeling runs, or are interpolated from TCEQ's Generic Modeling Results Tables.

Benzene ESL Compliance Demonstration

Section 4.3

Basis: This section demonstrates compliance with the benzene effects screening level (ESL) emission limitations in accordance with paragraph (k)(6)(A) & (B).

Method Used	E _{max}
Short-term Benzene ESL, P	170 µg/m ³
Long-term Benzene ESL, P	4.5 µg/m ³

Impacts by Source:

EPN	Source of Unit Impact Multiplier	Annual Operation hr/yr	Unit Impact Multiplier, G (@ Receptor)	Benzene Emissions		Generic Modeling (E _{MAX} Method) Evaluation			
						Weighted Ratio (WR)		E _{MAX} Emissions	
			G _{HOURLY} ^[1] (µg/m ³ /lb/hr)	Hourly lb/hr	Annual tpy	Hourly %	Annual %	Hourly lb/hr	Annual tpy
TK-2	TCEQ Generic Modeling Results Table 2	8,760	16.20	0.15	<0.01	4.53%	2.80%	0.48	0.43
TK-3	TCEQ Generic Modeling Results Table 2	8,760	16.20	0.24	0.01	7.36%	4.05%	0.77	0.62
DEHY-1	TCEQ Generic Modeling Results Table 2	8,760	23.60	0.01	0.03	0.18%	15.59%	0.01	1.63
DEHY-2	TCEQ Generic Modeling Results Table 2	8,760	23.60	0.01	0.03	0.18%	15.59%	0.01	1.63
FUG-1	TCEQ Generic Modeling Results Table 2	8,760	13.20	0.01	0.03	0.22%	18.61%	0.03	3.47
L-1	TCEQ Generic Modeling Results Table 2	8,760	16.80	0.01	0.03	0.18%	15.59%	0.02	2.29
L-1	TCEQ Generic Modeling Results Table 2	8,760	16.80	0.01	0.03	0.22%	18.61%	0.02	2.73
MSS	TCEQ Generic Modeling Results Table 4	480	12.00	0.37	<0.01	11.51%	0.23%	1.63	<0.01
MSS	TCEQ Generic Modeling Results Table 4	64	27.80	0.31	0.01	9.47%	4.28%	0.58	<0.01
MSS	TCEQ Generic Modeling Results Table 4	2	12.00	0.61	0.01	18.69%	3.53%	2.65	<0.01
MSS	TCEQ Generic Modeling Results Table 4	52	17.00	0.04	<0.01	1.28%	0.10%	0.13	<0.01
MSS	TCEQ Generic Modeling Results Table 4	48	27.50	1.48	<0.01	45.80%	0.90%	2.83	<0.01
MSS	TCEQ Generic Modeling Results Table 4	100	29.00	0.01	<0.01	0.38%	0.13%	0.02	<0.01
TOTALS				3.24	0.16	100.00%	100.00%	9.18	12.79

Benzene ESL Compliance Demonstration

Section 4.3

Site-Wide Impacts:

Compliance Demonstration (E_{MAX} Method)	Hourly	Annual
Benzene Emissions from All Sources (lb/hr)	3.24 lb/hr	0.16 tpy
Maximum Allowable Benzene Emissions (lb/hr)	9.18 lb/hr	12.79 tpy
Compliance Demonstrated? (Emissions < Allowable)	Yes	Yes

Notes:

- [1] Hourly Unit Impact Multipliers (G_{HOURLY}) are from SCREEN3 modeling runs, or are interpolated from the TCEQ's Generic Modeling Results Tables. Annual Impacts are calculated by multiplying G_{HOURLY} by 0.08, per the TCEQ guidance document "Modeling and Effects Review Applicability (MERA)", APDG 5874v5, Revised 03/18.
- [2] Variables used in above Impacts Table:
 - P**: applicable standard - lesser of NAAQS, 30 TAC 112 limit, and ESL (as applicable) ($\mu\text{g}/\text{m}^3$)
 - G**: applicable generic value ($\mu\text{g}/\text{m}^3/\text{lb}/\text{hr}$) from the Generic Modeling Results Tables paragraph (m) OR SCREEN3 modeling runs
 - WR**: weighted ratio of emissions of a specific contaminant for each EPN divided by the sum of total emissions for all EPNs
 - $E_{MAX\text{ HOURLY}}$** = maximum acceptable hourly (lb/hr) emissions for a specific air pollutant
 - $E_{MAX\text{ ANNUAL}}$** = maximum acceptable annual (tpy) emissions for a specific air pollutant

Equations used:

For Generic Modeling (E_{MAX} Method), Per Source:

- A. Weighted Ratio (WR), % = (Actual Emissions from Source, lb/hr or tpy) / (Sum of all Sources, lb/hr or tpy)
- B. $E_{MAX\text{ HOURLY}}$, lb/hr = (WR, %) x ($P_{\text{short-term}}$ $\mu\text{g}/\text{m}^3$) / (G , $\mu\text{g}/\text{m}^3/\text{lb}/\text{hr}$)
- C. $E_{MAX\text{ ANNUAL}}$, tpy = (WR, %) x [(Annual Operation, hr/yr / 2,000 lb/ton) x ($P_{\text{Long-term}}$ $\mu\text{g}/\text{m}^3$)] / [(0.08) x (G , $\mu\text{g}/\text{m}^3/\text{lb}/\text{hr}$)]

Charlie Brown Compressor Station
Targa Midstream Services LLC
TCEQ Oil and Gas Non-Rule Standard Permit
July 2024

H2S Compliance Demonstration

Section 4.4

Basis: This section demonstrates compliance with the Texas State Property Line Standard (Residential) for H2S in accordance with paragraph (k)(6)(A) & (B).

Method Used	E _{max}
Short-term H2S State Property Line Standard, P	108 µg/m ³

Impacts by Source:

EPN	Source of Unit Impact Multiplier	Unit Impact Multiplier, G (@ Property Line)	H2S Emissions	Generic Modeling (E _{MAX} Method) Evaluation	
		G _{HOURLY} ^[1] (µg/m ³ /lb/hr)	Hourly lb/hr	Weighted Ratio (WR)	E _{MAX} Emissions
				Hourly %	Hourly lb/hr
TK-2	TCEQ Generic Modeling Results Table 2	183.00	0.01	6.32%	0.04
TK-3	TCEQ Generic Modeling Results Table 2	183.00	<0.01	0.56%	<0.01
DEHY-1	TCEQ Generic Modeling Results Table 2	408.80	<0.01	0.08%	<0.01
DEHY-2	TCEQ Generic Modeling Results Table 2	408.80	<0.01	0.08%	<0.01
FUG-1	TCEQ Generic Modeling Results Table 2	2,625.00	<0.01	0.06%	<0.01
L-1	TCEQ Generic Modeling Results Table 2	739.20	<0.01	0.06%	<0.01
L-1	TCEQ Generic Modeling Results Table 2	739.20	0.02	20.53%	0.03
MSS	TCEQ Generic Modeling Results Table 4	25.00	<0.01	0.98%	0.04
MSS	TCEQ Generic Modeling Results Table 4	681.60	0.02	19.60%	0.03
MSS	TCEQ Generic Modeling Results Table 4	25.00	<0.01	1.34%	0.06
MSS	TCEQ Generic Modeling Results Table 4	51.00	0.04	48.04%	1.02
MSS	TCEQ Generic Modeling Results Table 4	517.50	<0.01	2.36%	<0.01
TOTALS			0.09	100.00%	1.22

H2S Compliance Demonstration

Section 4.4

Site-Wide Impacts:

Compliance Demonstration (E _{MAX} Method)	Hourly
H ₂ S Emissions from All Sources (lb/hr)	0.0901 lb/hr
Maximum Allowable H ₂ S Emissions (lb/hr)	1.22 lb/hr
Compliance Demonstrated? (Emissions < Allowable)	Yes

Notes:

- [1] Hourly Unit Impact Multipliers (G_{HOURLY}) are from SCREEN3 modeling runs, or are interpolated from the TCEQ's Generic Modeling Results Tables.
- [2] Variables used in above Impacts Table:
 - P**: applicable standard - lesser of NAAQS, 30 TAC 112 limit, and ESL (as applicable) (µg/m³)
 - G**: applicable generic value (µg/m³/lb/hr) from the Generic Modeling Results Tables paragraph (m) OR SCREEN3 modeling runs
 - WR**: weighted ratio of emissions of a specific contaminant for each EPN divided by the sum of total emissions for all EPNs
 - E_{MAX HOURLY}** = maximum acceptable hourly (lb/hr) emissions for a specific air pollutant

Equations used:

For Generic Modeling (E_{MAX} Method), Per Source:

- A. Weighted Ratio (WR), % = (Actual Emissions from Source, lb/hr or tpy) / (Sum of all Sources, lb/hr or tpy)
- B. E_{MAX HOURLY}, lb/hr = (WR, %) x (P_{short-term}, µg/m³) / (G, µg/m³/lb/hr)

State and Federal Rule Applicability

§116.610 - Applicability

Section 5.1

30 TAC 116 Subchapter F: Standard Permits

Requirement	Company Response
(a) <i>Under the Texas Clean Air Act, §382.051, a project that meets the requirements for a standard permit listed in this subchapter or issued by the commission is hereby entitled to the standard permit, provided the following conditions listed in this section are met. For the purposes of this subchapter, project means the construction or modification of a facility or a group of facilities submitted under the same registration.</i>	This site will comply with all applicable requirements for a standard permit.
(1) <i>Any project that results in a net increase in emissions of air contaminants from the project other than water, nitrogen, ethane, hydrogen, oxygen, or greenhouse gases (GHGs) as defined in §101.1 of this title (relating to Definitions), or those for which a national ambient air quality standard has been established must meet the emission limitations of §106.261 of this title (relating to Facilities (Emission Limitations)), unless otherwise specified by a particular standard permit.</i>	All project emission increases will meet the emission limits of §106.261 and §106.262, excluding the specified exempted pollutants or unless otherwise specified by the Oil and Gas Non-Rule Standard Permit.
(2) <i>Construction or operation of the project must be commenced prior to the effective date of a revision to this subchapter under which the project would no longer meet the requirements for a standard permit.</i>	Construction and operation of the project will comply will the applicable rules in effect at the time of permit issuance.
(3) <i>The proposed project must comply with the applicable provisions of the Federal Clean Air Act (FCAA), §111 (concerning New Source Performance Standards) as listed under 40 Code of Federal Regulations (CFR) Part 60, promulgated by the United States Environmental Protection Agency (EPA).</i>	This site will comply with all applicable NSPS. Please see the Federal Regulation Applicability section for details.
(4) <i>The proposed project must comply with the applicable provisions of FCAA, §112 (concerning Hazardous Air Pollutants) as listed under 40 CFR Part 61, promulgated by the EPA.</i>	This site will comply with all applicable NESHAP. Please see the Federal Regulation Applicability section for details.
(5) <i>The proposed project must comply with the applicable maximum achievable control technology standards as listed under 40 CFR Part 63, promulgated by the EPA under FCAA, §112 or as listed under Chapter 113, Subchapter C of this title (relating to National Emissions Standards for Hazardous Air Pollutants for Source Categories (FCAA, §112, 40 CFR Part 63)).</i>	This site will comply with all applicable MACT standards. Please see the Federal Regulation Applicability section for details.
(6) <i>If subject to Chapter 101, Subchapter H, Division 3 of this title (relating to Mass Emissions Cap and Trade Program) the proposed facility, group of facilities, or account must obtain allocations to operate</i>	Not applicable. This site is not subject to the MECT program.

§116.610 - Applicability

Section 5.1

30 TAC 116 Subchapter F: Standard Permits

Requirement	Company Response
(b) Any project that constitutes a new major stationary source or major modification as defined in §116.12 of this title (relating to Nonattainment and Prevention of Significant Deterioration Review Definitions) because of emissions of air contaminants other than greenhouse gases is subject to the requirements of §116.110 of this title (relating to Applicability) rather than this subchapter. Notwithstanding any provision in any specific standard permit to the contrary, any project that constitutes a new major stationary source or major modification which is subject to Subchapter B, Division 6 of this chapter (relating to Prevention of Significant Deterioration Review) due solely to emissions of greenhouse gases may use a standard permit under this chapter for air contaminants that are not greenhouse gases.	This project does not constitute a new major source or major modification under PSD or nonattainment definitions. Please see the Emission Summary for details. Therefore, the use of a standard permit is allowed.
(c) Persons may not circumvent by artificial limitations the requirements of §116.110 of this title.	The requirements of §116.110 will not be circumvented.
(d) Any project involving a proposed affected source (as defined in §116.15(1) of this title (relating to Section 112(g) Definitions)) shall comply with all applicable requirements under Subchapter E of this chapter (relating to Hazardous Air Pollutants: Regulations Governing Constructed or Reconstructed Major Sources (FCAA, §112(g), 40 CFR Part 63)). Affected sources subject to Subchapter E of this chapter may use a standard permit under this subchapter only if the terms and conditions of the specific standard permit meet the requirements of Subchapter E of this chapter.	Not applicable. No facilities in this project are subject to Subchapter E of Chapter 116 or are considered affected sources as defined in §116.15(1).

Source Note: The provisions of this §116.610 adopted to be effective May 4, 1994, 19 TexReg 3055; amended to be effective September 1, 1995, 20 TexReg 6324; amended to be effective April 19, 1996, 21 TexReg 3192; amended to be effective May 22, 1997, 22 TexReg 4242; amended to be effective July 8, 1998, 23 TexReg 6973; amended to be effective January 11, 2000, 25 TexReg 150; amended to be effective March 29, 2001, 26 TexReg 2398; amended to be effective February 1, 2006, 31 TexReg 515; amended to be effective April 17, 2014, 39 TexReg 2901

§116.611 - Registration to Use a Standard Permit
30 TAC 116 Subchapter F: Standard Permits

Section 5.2

Requirement	Company Response
(a) <i>If required, registration to use a standard permit shall be submitted using the electronic method designated by the executive director for the applicable standard permit. If a designated electronic method is not available, the registration shall be sent by certified mail, return receipt requested, or hand delivered to the executive director, the appropriate commission regional office, and any local air pollution program with jurisdiction, before a standard permit can be used. The registration must be submitted using the required form and must document compliance with the requirements of this section, including, but not limited to:</i> (1) <i>the basis of emission estimates;</i> (2) <i>quantification of all emission increases and decreases associated with the project being registered;</i> (3) <i>sufficient information as may be necessary to demonstrate that the project will comply with §116.610(b) of this title (relating to Applicability);</i> (4) <i>information that describes efforts to be taken to minimize any collateral emissions increases that will result from the project;</i> (5) <i>a description of the project and related process; and</i> (6) <i>a description of any equipment being installed.</i>	All required information is included in this application.
(b) <i>Construction may begin any time after receipt of written notification from the executive director that there are no objections or 45 days after receipt by the executive director of the registration, whichever occurs first, except where a different time period is specified for a particular standard permit or the source obtains a prevention of significant deterioration permit for greenhouse gases as provided in §116.164(a) of this title (relating to Prevention of Significant Deterioration Applicability for Greenhouse Gases Sources).</i>	The project's construction will comply with the timing specified in the Oil and Gas Non-Rule Standard Permit.

§116.611 - Registration to Use a Standard Permit
30 TAC 116 Subchapter F: Standard Permits

Section 5.2

Requirement	Company Response
(c) <i>In order to avoid applicability of Chapter 122 of this title (relating to Federal Operating Permits), a certified registration shall be submitted. The certified registration must state the maximum allowable emission rates and must include documentation of the basis of emission estimates and a written statement by the registrant certifying that the maximum emission rates listed on the registration reflect the reasonably anticipated maximums for operation of the facility. The certified registration shall be amended if the basis of the emission estimates changes or the maximum emission rates listed on the registration no longer reflect the reasonably anticipated maximums for operation of the facility. The certified registration shall be submitted to the executive director; to the appropriate commission regional office; and to all local air pollution control agencies having jurisdiction over the site. Certified registrations must also be maintained in accordance with the requirements of §116.115 of this title (relating to General and Special Conditions).</i> (1) <i>Certified registrations established prior to December 11, 2002, shall be submitted on or before February 3, 2003.</i> (2) <i>Certified registrations established on or after December 11, 2002, shall be submitted no later than the date of operation.</i>	This certified registration application demonstrates that maximum allowable emissions are above Title V permitting thresholds. Please see the Emission Summary section for details.
(3) <i>Certified registrations established for greenhouse gases (as defined in §101.1 of this title (relating to Definitions)) on or after the effective date of United States Environmental Protection Agency's (EPA) final action approving amendments to §122.122 of this title (relating to Potential to Emit) into the State Implementation Plan shall be submitted:</i> (A) <i>for existing sites that emit or have the potential to emit greenhouse gases, no later than 12 months after the effective date of EPA's final action approving amendments to §122.122 of this title as a revision to the Federal Operating Permits Program; or</i> (B) <i>for new sites that emit or have the potential to emit greenhouse gases, no later than the date of operation.</i>	Not applicable. This site does not have a greenhouse gas permit.

Source Note: The provisions of this §116.611 adopted to be effective May 4, 1994, 19 TexReg 3055; amended to be effective May 22, 1997, 22 TexReg 4242; amended to be effective July 8, 1998, 23 TexReg 6973; amended to be effective January 11, 2000, 25 TexReg 150; amended to be effective December 11, 2002, 27 TexReg 11574; amended to be effective April 17, 2014, 39 TexReg 2901; amended to be effective November 22, 2018, 43 TexReg 7540

§116.615 - General Conditions
30 TAC 116 Subchapter F: Standard Permits

Section 5.3

Requirement	Company Response
<i>The following general conditions are applicable to holders of standard permits, but will not necessarily be specifically stated within the standard permit document.</i>	All standard permit general conditions will be met.
(1) <i>Protection of public health and welfare. The emissions from the facility, including dockside vessel emissions, must comply with all applicable rules and regulations of the commission adopted under Texas Health and Safety Code, Chapter 382, and with the intent of the Texas Clean Air Act (TCAA), including protection of health and property of the public.</i>	All emissions from this site will comply with all applicable rules and regulations and with the intent of the TCAA.
(2) <i>Standard permit representations. All representations with regard to construction plans, operating procedures, pollution control methods, and maximum emission rates in any registration for a standard permit become conditions upon which the facility or changes thereto, must be constructed and operated. It is unlawful for any person to vary from such representations if the change will affect that person's right to claim a standard permit under this section. Any change in condition such that a person is no longer eligible to claim a standard permit under this section requires proper authorization under §116.110 of this title (relating to Applicability). Any changes in representations are subject to the following requirements:</i> (A) <i>For the addition of a new facility, the owner or operator shall submit a new registration incorporating existing facilities with a fee, in accordance with §116.611 and §116.614 of this title, (relating to Registration to use a Standard Permit and Standard Permit Fees) prior to commencing construction. If the applicable standard permit requires public notice, construction of the new facility or facilities may not commence until the new registration has been issued by the executive director.</i> (B) <i>For any change in the method of control of emissions, a change in the character of the emissions, or an increase in the discharge of the various emissions, the owner or operator shall submit written notification to the executive director describing the change(s), along with the designated fee, no later than 30 days after the change.</i> (C) <i>For any other change to the representations, the owner or operator shall submit written notification to the executive director describing the change(s) no later than 30 days after the change.</i> (D) <i>Any facility registered under a standard permit which contains conditions or procedures for addressing changes to the registered facility which differ from subparagraphs (A) - (C) of this paragraph shall comply with the applicable requirements of the standard permit in place of subparagraphs (A) - (C) of this paragraph.</i>	All representations in this application with regard to construction plans, operating procedures, pollution control methods, and maximum emission rates are conditions upon which the site must be operated.
(3) <i>Standard permit in lieu of permit amendment. All changes authorized by standard permit to a facility previously permitted under §116.110 of this title shall be administratively incorporated into that facility's permit at such time as the permit is amended or renewed.</i>	Not applicable. This site is not currently authorized under a 30 TAC §116.110 permit.
(4) <i>Construction progress. Start of construction, construction interruptions exceeding 45 days, and completion of construction shall be reported to the appropriate regional office not later than 15 working days after occurrence of the event, except where a different time period is specified for a particular standard permit.</i>	All required notifications will be submitted.

§116.615 - General Conditions
30 TAC 116 Subchapter F: Standard Permits

Section 5.3

Requirement	Company Response
(5) Start-up notification. (A) <i>The appropriate air program regional office of the commission and any other air pollution control agency having jurisdiction shall be notified prior to the commencement of operations of the facilities authorized by a standard permit in such a manner that a representative of the executive director may be present.</i> (B) <i>For phased construction, which may involve a series of units commencing operations at different times, the owner or operator of the facility shall provide separate notification for the commencement of operations for each unit.</i> (C) <i>Prior to beginning operations of the facilities authorized by the permit, the permit holder shall identify to the Office of Permitting, Remediation, and Registration, the source or sources of allowances to be utilized for compliance with Chapter 101, Subchapter H, Division 3 of this title (relating to Mass Emissions Cap and Trade Program).</i> (D) <i>A particular standard permit may modify start-up notification requirements.</i>	All required notifications will be submitted.
(6) Sampling requirements. <i>If sampling of stacks or process vents is required, the standard permit holder shall contact the commission's appropriate regional office and any other air pollution control agency having jurisdiction prior to sampling to obtain the proper data forms and procedures. All sampling and testing procedures must be approved by the executive director and coordinated with the regional representatives of the commission. The standard permit holder is also responsible for providing sampling facilities and conducting the sampling operations or contracting with an independent sampling consultant.</i>	If sampling or testing is required, all requirements will be met.
(7) Equivalency of methods. <i>The standard permit holder shall demonstrate or otherwise justify the equivalency of emission control methods, sampling or other emission testing methods, and monitoring methods proposed as alternatives to methods indicated in the conditions of the standard permit. Alternative methods must be applied for in writing and must be reviewed and approved by the executive director prior to their use in fulfilling any requirements of the standard permit.</i>	Not applicable. No alternate control, sampling, testing, or monitoring methods are being requested.
(8) Recordkeeping. <i>A copy of the standard permit along with information and data sufficient to demonstrate applicability of and compliance with the standard permit shall be maintained in a file at the plant site and made available at the request of representatives of the executive director, the United States Environmental Protection Agency, or any air pollution control agency having jurisdiction. For facilities that normally operate unattended, this information shall be maintained at the nearest staffed location within Texas specified by the standard permit holder in the standard permit registration. This information must include, but is not limited to, production records and operating hours. Additional recordkeeping requirements may be specified in the conditions of the standard permit. Information and data sufficient to demonstrate applicability of and compliance with the standard permit must be retained for at least two years following the date that the information or data is obtained. The copy of the standard permit must be maintained as a permanent record.</i>	All required records will be maintained as specified.

§116.615 - General Conditions
30 TAC 116 Subchapter F: Standard Permits

Section 5.3

Requirement	Company Response
(9) <i>Maintenance of emission control. The facilities covered by the standard permit may not be operated unless all air pollution emission capture and abatement equipment is maintained in good working order and operating properly during normal facility operations. Notification for emissions events and scheduled maintenance shall be made in accordance with §101.201 and §101.211 of this title (relating to Emissions Event Reporting and Recordkeeping Requirements; and Scheduled Maintenance, Startup, and Shutdown Reporting and Recordkeeping Requirements).</i>	All air pollution emission capture and abatement equipment will be maintained and operated properly during normal facility operations. Notification of emission events or maintenance will be made in accordance with §101.201 and §101.211. All emissions controls will be maintained in good working order and operated properly.
(10) <i>Compliance with rules. Registration of a standard permit by a standard permit applicant constitutes an acknowledgment and agreement that the holder will comply with all rules, regulations, and orders of the commission issued in conformity with the TCAA and the conditions precedent to the claiming of the standard permit. If more than one state or federal rule or regulation or permit condition are applicable, the most stringent limit or condition shall govern. Acceptance includes consent to the entrance of commission employees and designated representatives of any air pollution control agency having jurisdiction into the permitted premises at reasonable times to investigate conditions relating to the emission or concentration of air contaminants, including compliance with the standard permit.</i>	The permit holder will comply with all applicable rules and regulations, and with this intent of the TCAA.
(11) <i>Distance limitations, setbacks, and buffer zones. Notwithstanding any requirement in any standard permit, if a standard permit for a facility requires a distance, setback, or buffer from other property or structures as a condition of the permit, the determination of whether the distance, setback, or buffer is satisfied shall be made on the basis of conditions existing at the earlier of:</i> (A) <i>the date new construction, expansion, or modification of a facility begins; or</i> (B) <i>the date any application or notice of intent is first filed with the commission to obtain approval for the construction or operation of the facility.</i>	Compliance with any distance limitations, setbacks, or buffer zones will be based on conditions at the time of start of construction or application submission.

Source Note: The provisions of this §116.615 adopted to be effective September 1, 1995, 20 TexReg 6324; amended to be effective May 22, 1997, 22 TexReg 4242; amended to be effective July 8, 1998, 23 TexReg 6973; amended to be effective March 29, 2001, 26 TexReg 2398; amended to be effective September 12, 2002, 27 TexReg 8546; amended to be effective March 15, 2007, 32 TexReg 1320; amended to be effective November 22, 2018, 43 TexReg 7540

Oil & Gas Non-Rule Standard Permit

Section 5.4

Standard Permit Requirement	Company Response
(a) Applicability. <i>This standard permit applies to all stationary facilities, or groups of facilities, at a site which handle gases and liquids associated with the production, conditioning, processing, and pipeline transfer of fluids or gases found in geologic formations on or beneath the earth's surface including, but not limited to, crude oil, natural gas, condensate, and produced water with the following conditions.</i>	This site handles natural gas and natural gas liquids. Therefore, this Oil & Gas Non-Rule Standard Permit (NRSP) is applicable.
(a)(1) <i>The requirements in paragraphs (a)-(k) of this standard permit are applicable in only for new projects and dependent facilities located in the Barnett Shale (Cooke, Dallas, Denton, Ellis, Erath, Hill, Hood, Jack, Johnson, Montague, Palo Pinto, Parker, Somervell, Tarrant, and Wise Counties) on or after April 1, 2011. For all other new projects and dependent facilities in all other counties of the state, paragraph (l) of this standard permit is applicable.</i>	County: Reagan This site is not located in a Barnett Shale listed county. The company is choosing to voluntarily register the site under this NRSP, as allowed by the TCEQ.
(a)(2) <i>Only one Air Quality Standard Permit for Oil and Gas Handling and Production Facilities for an oil and gas site (OGS) may be registered for a combination of dependent facilities and authorizes all facilities in sweet or sour service. This standard permit may not be used if operationally dependent facilities are authorized by the permit by rule in Title 30, Texas Administrative Code (30 TAC) §106.352, Oil and Gas Handling and Production Facilities, or a permit under 30 TAC §116.111, General Application. Existing authorized facilities, or groups of facilities, at an OGS under this standard permit which are not changing certified character or quantity of emissions must only meet subsections (i) and (k) of this standard permit (protectiveness review and planned maintenance, startup, and shutdown (MSS) requirements) and otherwise retain their existing authorization. Other facilities which are not covered under this standard permit may be authorized by other authorizations at an OGS if (b)(6) and (k) of this standard permit are met.</i>	This is the only authorization requested for this group of operationally dependent facilities.
(a)(3) <i>This standard permit does not relieve the owner or operator from complying with any other applicable provision of the Texas Health and Safety Code, Texas Water Code, rules of the Texas Commission on Environmental Quality (TCEQ), or any additional local, state or federal regulations. Emissions that exceed the limits in this standard permit are not authorized and are violations.</i>	The company will comply with applicable local, state, and federal regulations.
(a)(4) <i>Emissions from upsets, emergencies, or malfunctions are not authorized by this standard permit. This standard permit does not regulate methane, ethane, or carbon dioxide.</i>	These types of emissions are not included in this registration.
(b) Definitions and Scope.	
(b)(1) <i>Facility is a discrete or identifiable structure, device, item, equipment, or enclosure that constitutes or contains a stationary source. Stationary sources associated with a mine, quarry, or well test lasting less than 72 hours are not considered facilities.</i>	The company will use the term facility as defined here.
(b)(2) <i>Receptor includes any building which is in use as a single or multi-family residence, school, day-care, hospital, business, or place of worship at the time this standard permit is registered. A residence is a structure primarily used as a permanent dwelling. A business is a structure that is occupied for at least 8 hours a day, 5 days a week, and does not include businesses who are handling or processing materials as described in subsection (a). This term does not include structures occupied or used solely by the owner or operator of the oil and gas facility, or the mineral rights owner of the property upon which the facility is located. All measurements of distance to receptors shall be taken from the emission release point at the oil and gas facility that is nearest to the point on the building that is nearest to the oil and gas facility.</i>	The company will use the term receptor as defined here.
(b)(3) <i>An OGS is defined as all facilities which meet the following: (A) Located on contiguous or adjacent properties; (B) Under common control of the same person (or persons under common control); and (C) Designated under same 2-digit standard industrial classification (SIC) codes.</i>	All facilities at this site meet this definition.
(b)(4) <i>For purposes of determining applicability of 30 TAC Chapter 122, Federal Operating Permits, the definitions of 30 TAC §122.10, General Definitions, apply.</i>	The company will utilize the definitions located in 30 TAC §122.10.
(b)(5) <i>A project under this standard permit is defined as the following and must meet all requirements of this standard permit prior to construction or implementation of changes.</i> (A) <i>Any new facility or new group of operationally dependent facilities at an OGS; or</i>	The project to be authorized by this standard permit meets this definition and will meet all requirements.

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<i>(B) Physical changes to existing authorized facilities or group of facilities at an OGS which increase the potential to emit over previously registered emission limits; or</i> <i>(C) Operational changes to existing authorized facilities or group of facilities at an OGS which increase the potential to emit over previously registered emission limits.</i>	
<i>(b)(6) For purposes of registration under this standard permit, the following facilities shall be included:</i> <i>(A) All facilities or groups of facilities at an OGS which are operationally dependent on each other;</i> <i>(B) Facilities must be located within a 1/4 mile of a project emission point, vent, or fugitive component, except for those components excluded in (b)(6)(C) of this standard permit;</i> <i>(C) If piping or fugitive components are the only connection between facilities and the distance between facilities exceeds 1/4 mile, then the facilities are considered separate for purposes of this registration;</i> <i>(D) The boundaries of the registration become fixed at the time this standard permit is registered. No individual facility may be authorized under more than one registration;</i> <i>(E) Any facility or group of facilities authorized under an existing standard permit registration which is operationally dependent on a project must be revised to incorporate the project; and</i> <i>(F) A registration may include facilities which are claiming 30 TAC §116.620, Installation and/or Modification of Oil and Gas Facilities as well as projects which are claiming this standard permit. Existing authorized facilities, or group of facilities, at an OGS under this standard permit which are not changing registered and certified character or quantity of emissions must only meet paragraphs (i) and (k) of this standard permit (the protectiveness review and planned maintenance, startup, and shutdown (MSS) requirements) until the registration is renewed after December 31, 2015, after which paragraphs (a) – (k) of this standard permit apply.</i>	All facilities required to be authorized by this standard permit are included.
<i>(b)(7) For purposes of all previous claims of this standard permit (or any previous version of this standard permit) where no project is occurring:</i> <i>(A) Existing authorized facilities, or group of facilities, which have not registered planned MSS activity emissions prior to the effective dates in (a)(1) of this standard permit must meet paragraph (i) of this standard permit (planned MSS) no later than January 5, 2012; or</i> <i>(B) Existing authorized facilities, or group of facilities, which have registered planned MSS activity emissions and compliance with 30 TAC §116.620(a)(1) has been demonstrated prior to the effective dates in (a)(1) of this standard permit, must meet paragraph (i) of this standard permit (planned MSS) no later than the registration renewal submitted after December 31, 2015.</i>	This is an existing site, authorized by a previous version of this standard permit. Planned MSS emissions have been included as part of this standard permit registration.

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(b)(8) For purposes of ensuring protection of public health and welfare and demonstrating compliance with applicable ambient air standards and effects screening levels, the impacts analysis as specified in paragraph (k) of this standard permit must be completed. (A) All impacts analysis must be done on a contaminant-by-contaminant basis for any net project increases. If a claim under this standard permit is only for planned MSS under paragraph (i) of this standard permit, the analysis shall evaluate planned MSS scenarios only. (B) Hourly and annual emissions shall be limited based on the most stringent of paragraphs (h) or (k) of this standard permit.	Compliance with all applicable ambient air standards and effects screening levels has been demonstrated, per paragraph (k). Please see the Impacts Analyses section for details (Section 4). Hourly and annual emissions meet the more stringent of paragraphs (h) or (k). Please see the Emission Summary section for details (Section 1).
(c) Authorized Facilities, Changes and Activities.	
(c)(1) For existing OGS which are authorized by previous versions of this standard permit: (A) A project requires registration unless otherwise specified. (B) The following projects do not require registration, but must comply with best management practices in paragraph (e) of this standard permit, compliance demonstrations in paragraphs (i) and (j) of this standard permit and must be incorporated into the registration at the next revision or certification: (i) Addition of any piping, fugitive components, any other new facilities that increase registered emissions less than or equal to 1.0 tpy volatile organic compounds (VOC), 5.0 tpy nitrogen oxides (NOx), 0.01 tpy benzene, and 0.05 tpy hydrogen sulfide (H₂S) over a rolling 12-month period; (ii) Changes to any existing facilities that increase registered emissions less than or equal to 1.0 tpy VOC, 5.0 tpy nitrogen oxides (NOx), 0.01 tpy benzene, and 0.05 tpy H₂S over a rolling 12-month period; or (iii) Total increases over a rolling 60-month period that are less than or equal to 5.0 tpy VOC or NOx, 0.05 tpy benzene, or 0.1 tpy H₂S; or (iv) Addition of any new engine rated less than 100 horsepower (hp); or (v) Replacement of any facility if the new facility does not increase the previous registered emissions. (C) In lieu of registering proposed changes under this standard permit, incremental emissions increases associated with construction of new facilities or changes to existing facilities may be authorized by 30 TAC §106.261, Facilities (Emission Limitations) or §106.262, Facilities (Emissions and Distance Limitations), if the maximum worst-case emissions also meet the limitations established by paragraphs (b)(8) and (k) of this standard permit for all contaminants with proposed increases.	This updated project is being registered.

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(c)(2) All authorizations under this standard permit shall meet the following: (A) New, changed, or replacement facilities shall not exceed the thresholds for major source or major modification as defined in 30 TAC §116.12, Nonattainment and Prevention of Significant Deterioration Review Definitions, and in Federal Clean Air Act §112(g) or §112(j); (B) All facilities shall comply with all applicable 40 Code of Federal Regulations (CFR), Parts 60, 61, and 63 requirements for New Source Performance Standards (NSPS), National Emission Standards for hazardous Air Pollutants (NESHAP), and Maximum Achievable Control Technology (MACT); and (C) All facilities shall comply with all applicable requirements of 30 TAC Chapters 111, Control of Air Pollution from Visible Emissions and Particulate Matter, 112, Control of Air Pollution from Sulfur Compounds, 113, Standards of Performance for Hazardous Air Pollutants and for Designated Facilities and Pollutants, 115, Control of Air Pollution from Volatile Organic Compounds, and 117, Control of Air Pollution from Nitrogen Compounds.	The site is not a new major stationary source under the New Source Review requirements of the FCAA, Part C (PSD). The site is in an area that is classified as attainment or unclassified with the NAAQS for all pollutants. Oil and gas production facilities are not a listed source category under 40 CFR §52.21(b)(1). Therefore, the facility would be considered a major source if criteria pollutant emissions were greater than or equal to the major source threshold of 250 tpy for each pollutant. As summarized in Section 1, the maximum annual emission rates for each criteria pollutant are less than 250 tpy. Therefore, the site will be a minor source as defined in the rules, and PSD review is not triggered. All facilities will comply with all applicable regulations. See the Federal Regulation Applicability section (Section 5.6) for details. See the State Regulation Applicability section (Section 5.5) for details.
(c)(3) To be eligible for this standard permit an applicant: (A) shall meet all applicable requirements as set forth in this standard permit; (B) shall not misrepresent or fail to fully disclose all relevant facts in obtaining the permit; and (C) shall not be indebted to the state for failure to make payment of penalties or taxes imposed by the statutes or rules within the commission's jurisdiction.	The company will comply with all requirements.
(c)(4) All facilities related to the operation of any OGS, under any version of this standard permit (or co-located at a site with an OGS standard permit), previously authorized by, and continuing to meet, the conditions of a permit by rule under 30 TAC Chapter 106, Permits by Rule (or any historical version) must: (A) Be incorporated into this standard permit in any initial registration, revision, or renewal for this standard permit. These facilities will become authorized by this standard permit and previous authorizations will be voided. (B) Meet all emission limits established by this standard permit and review in accordance with paragraph (b)(8) of this standard permit. (C) Meet requirements of paragraphs (e), (i), and (j) of this standard permit for Best Management Practices and Minimum Requirements, Planned MSS, and associated Records, Sampling and Monitoring of this standard permit. (D) Only if facilities or groups of facilities are changed in such a way as to increase the potential to emit, production processing capacity, or registered emission rate, the requirements in paragraph (e) (BACT) of this standard permit are required to be met. In all other cases, these facilities are not required to meet paragraph (e) of this standard permit.	No facilities at this site related to the operation of this OGS are authorized under another permitting mechanism.

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(d) Facilities and Exclusions	
(d)(1) Only the following specific facilities and groups of facilities have been evaluated for this standard permit, along with supporting infrastructure equipment and facilities, and may be included in a registration: (A) Fugitive components, including valves, pressure relief valves, pipe flanges and connectors, pumps, compressors, stuffing boxes, instrumentation and meters, natural gas driven pneumatic pumps, and other similar devices with seals that separate process and waste material from the atmosphere and the associated piping; (B) Separators, including all gas, oil, and water physical separation units; (C) Treatment and processing equipment, including heater-treaters, methanol injection, glycol dehydrators, molecular or mole sieves, amine sweeteners, H_2S scavenger chemical reaction vessels for sulfur removal, and iron sponge units; (D) Cooling towers and associated heat exchangers; (E) Gas recovery units, including cryogenic expansion, absorption, adsorption, heat exchangers, and refrigeration units; (F) Combustion units, including engines, turbines, boilers, reboilers, and heaters; (G) Storage tanks for crude oil, condensate, produced water fuels, treatment chemicals, slop and sump oils and pressure tanks with liquified petroleum gases; (H) Surface facilities associated with underground storage of gas or liquids; (I) Truck loading equipment; (J) Control equipment, including vapor recovery systems, glycol and amine reboiler condensers, flares, vapor combustors, and thermal oxidizers; and (K) Temporary facilities used for planned maintenance, and temporary control devices for planned start-ups and shutdowns.	Only facilities listed in this section are included in this authorization request.
(d)(2) Exclusions. The following are not authorized under this standard permit: (A) Sour water strippers or sulfur recovery units; (B) Carbon dioxide hot carbonate processing units; (C) Water injection facilities (these facilities may otherwise be authorized by 30 TAC §106.351, Salt Water Disposal); (D) Liquefied petroleum gases, crude oil, or condensate transfer or loading into or from railcars, ships, or barges. These facilities may otherwise be authorized by 30 TAC §106.261, Facilities (Emission Limitations)) and §106.262, Facilities (Emissions and Distance Limitations); (E) Incinerators for solid waste destruction; (F) Remediation of petroleum contaminated water and soil. These facilities may otherwise be authorized by 30 TAC §106.533, Remediation; and (G) Cooling Towers and heat exchangers with direct contact with gaseous or liquid process streams containing VOC, H_2S, halogens or halogen compounds, cyanide compounds, inorganic acids, or acid gases.	None of these facilities are included in this authorization request.
(e) Best Management Practices (BMP) and Best Available Control Technology (BACT) Requirements. For any project, and any associated emission control equipment registered under this standard permit this paragraph shall be met as applicable. These requirements are not applicable to existing, unchanging facilities until any renewal submitted after December 31, 2015.	
(e)(1) All facilities which have the potential to emit air contaminants must be maintained in good working order and operated properly during facility operations. Each operator shall establish and maintain a program to replace, repair, and/or maintain facilities to keep them in good working order. The minimum requirements of this program shall include: (A) Compliance with manufacturer's specifications and recommended programs applicable to equipment performance and effect on emissions, or alternatively, an owner or operator developed maintenance plan for such equipment that is consistent with good air pollution control practices. (B) Cleaning and routine inspection of all equipment; and (C) Replacement and repair of equipment on schedules which prevent equipment failures and maintain performance.	All requirements of (e)(1) will be met.

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Standard Permit Requirement	Company Response
(e)(2) Any OGS facility shall be operated at least 50 feet from any property line or receptor (whichever is closer to the facility). This distance limitation does not apply to the following: (A) Any fugitive components that are used for isolation and or safety purposes may be located at one-half of the width of any applicable easement; (B) Any facility at a location for which the distance requirements were satisfied at the time this standard permit is registered (provided that the authorization was maintained) regardless of whether a receptor is subsequently built or put to use less than 50 feet from any OGS facility; or (C) Existing facilities which are located less than 50 feet from a property line or receptor when constructed and previously authorized. If modified or replaced, the operator shall consider, to the extent that good engineering practice will permit, moving these facilities to meet the 50 foot requirement. Replacement facilities must meet all other requirements of this standard permit.	Distance to nearest property line: ≥50 ft All facilities will be at least 50 feet from the nearest property line or receptor.
(e)(3) Engines and turbines shall meet the emission and performance standards listed in Table 6 in paragraph (m) and the following requirements: (A) Liquid fueled engines used for back-up power generation and periodic power needs at the OGS are authorized if the fuel has no more than 0.05% sulfur and the engine is operated less than 876 hours per rolling 12-month period. (B) Engines and turbines used for electric generation more than 876 hours per rolling 12-month period are authorized if no reliable electric service is readily available. In all other circumstances, electric generators must meet the technical requirements of the Air Quality Standard Permit for Electric Generating Unit (EGU) (not including the EGU standard permit registration requirements) and the emissions shall be included in the registration under this standard permit; (C) All applicable requirements of 30 TAC Chapter 117; and (D) All applicable requirements of 40 CFR Part 60 and 40 CFR Part 63. (E) Compression ignition engines that are rated less than 225 kW (300 hp) and emit less than or equal to the emission tier for an equivalent sized model year 2008 non-road compression ignition engine located at 40 CFR § 89.112, Table 1 are authorized.	This site will meet all of the engine requirements under (e)(3) and Table 6 as applicable. There are no turbines at this site.
(e)(4) Open-topped tanks or ponds containing VOCs or H₂S are allowed up to a PTE equal to 1 tpy of VOC and 0.1 tpy of H₂S.	N/A. There are no open-topped tanks or ponds at this site.
(e)(5) All process equipment and storage facilities individually must meet the requirements of BACT listed in Table 10 in paragraph (m). Any combination of process equipment and storage facilities with an uncontrolled PTE of equal to or greater than 25 tpy of VOC must also meet the requirements of Table 10, row titled "Combined Control Requirements." All of the following streams and facilities must be included for this site-wide assessment: (A) For any gaseous vent stream with a concentration of 1% VOC must be considered for capture and control requirements; (B) For any liquid stream with a potential to emit of equal to or greater than 1 tpy VOC for each vessel or storage facility.	All requirements of (e)(5) will be met. See Table 10 at the end of this section for details.
(e)(6) The following shall apply to all fugitive components associated with the project: (A) All seals and gaskets in VOC or H₂S service shall be installed, checked, and properly maintained to prevent leaking. All components shall be physically inspected quarterly for leaks. (B) New and replaced fugitive components and instrumentation in gas or liquid service with the uncontrolled potential to emit equal to or greater than 10 tpy VOC or 1 tpy H₂S are subject to a leak detection and repair (LDAR) program as specified in Table 9 in paragraph (m). Additional requirements are applicable where uncontrolled potential to emit equal to or greater than 25 tpy VOC or 5 tpy H₂S as specified in Table 9. Planned MSS from fugitive components must also meet the requirements of Table 9.	Uncontrolled fugitive VOC PTE = 24.36 tpy Uncontrolled fugitive H₂S PTE = 0.001 tpy This site will meet all requirements (e)(6)(A). This site will have fugitive emissions with an uncontrolled PTE equal or greater than 10 tpy VOC or 1 tpy H₂S; therefore, (e)(6)(B) is applicable and fugitive components are subject to the leak detection and repair (LDAR) program specified in Table 9 in paragraph (m)

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(C) All components found to be leaking shall be repaired. Every reasonable effort shall be made to repair a leaking component. All leaks not repaired immediately shall be tagged or noted in a log. At manned sites, leaks shall be repaired no later than 30 days after the leak is found. At unmanned sites, leaks shall be repaired no later than 60 days after the leak is found. If the repair of a component would require a unit shutdown, which would create more emissions than the repair would eliminate, the repair may be delayed until the next shutdown. (D) Tank hatches, not designed to be completely sealed, shall remain closed (but not completely sealed in order to maintain safe design functionality) except for sampling, gauging, loading, unloading, or planned maintenance activities. (E) To the extent that good engineering practices will permit, new and reworked valves and piping connections shall be located in a place that is reasonably accessible for leak checking during plant operation and underground process pipelines shall contain no buried valves such that fugitive emission monitoring is rendered impractical.	Table 9 in paragraph (m). Uncontrolled potential to emit emissions are less than 25 tpy VOC and 5 tpy H₂S; therefore additional requirements specified in Table 9 do not apply. Planned MSS from fugitive components must also meet the requirements of Table 9. This site will meet all applicable requirements. For details, please see Table 9 at the end of this section. This site will meet all requirements (e)(6)(C)-(E).
(e)(7) Tanks and vessels must utilize a paint color that minimizes the effects of solar heating (including, but not limited to, white or aluminum). To meet this requirement the solar absorptance should be 0.43 or less, as referenced in Table 7.1-6 in Compilation of Air Pollutant Emission Factors (AP-42). Paint shall be applied according to paint producers recommended application requirements if provided and in sufficient quantity as to be considered solar resistant. Paint shall be maintained in good condition and will not compromise tank integrity. Minimal amounts of rust may be present not to exceed 10% of the external surface area of the roof or walls of the tank and in no way may compromise tank integrity. Additionally, up to 10% of the external surface area of the roof or walls of the tank or vessel may be painted with other colors to allow for identification and/or aesthetics. For tanks and vessels purposefully darkened to create the process reaction and help condense liquids from being entrained in the vapor or are in an area whereby a local, state, federal law, ordinance, or private contract predating this standard permit's effective date establishes in writing tank and vessel colors other than white, these requirements do not apply.	This site will meet all requirements of (e)(7), as applicable.
(e)(8) All emission estimation methods including but not limited to computer programs such as GRI-GLYCalc, AmineCalc, E&P Tanks, and Tanks 4.0, must be used with monitoring data generated in accordance with Table 8 in subsection (m) of this section where monitoring is required. All emission estimation methods must also be used in a way that is consistent with protocols established by the commission or promulgated in federal regulations (NSPS, NESHAPS). Where control of emissions is relied upon to meet subsection (k) of this section, control monitoring is required.	This site will meet all requirements (e)(8). See the emissions calculations in Section 5 for further information.
(e)(9) Process reboilers, heaters, and furnaces that are also used for control of waste gas streams may claim 50 to 99% destruction efficiency for VOCs and H₂S depending on the design and level of monitoring applied. The 90% destruction may be claimed where the waste gas is delivered to the flame zone or combustion fire box with basic monitoring as specified in paragraph (j). Any value greater than 90% and up to 99% destruction efficiency may be claimed where enhanced monitoring and/or testing are applied as specified in paragraph (j). If the waste gas is premixed with the primary fuel gas and used as the primary fuel in the device through the primary fuel burners, 99% destruction may be claimed with basic monitoring as specified in paragraph (j). In systems where the combustion device is designed to cycle on and off to maintain the designed heating parameters, and may not fully utilize the waste gas stream, records of run time and enhanced monitoring is required to claim any run time beyond 50%.	This site will utilize one or more glycol reboilers, each with an estimated destruction efficiency of 98% for VOCs.
(e)(10) Vapor Recovery Systems (VRSs) may claim up to 100% control. The control efficiency is based on whether it is a mechanical VRU (mVRU) or a liquid VRU (lVRU). The VRUs must meet the appropriate design, monitoring and record-keeping in Table 7 and Table 8 in paragraph (m).	N/A. There are no vapor recovery systems at this site.
(e)(11) Flares used for control of emissions from production, planned MSS, emergency, or upset events may claim design destruction efficiency of 98% for VOCs and H₂S and 99% for VOCs containing no more than three carbon atoms that contain no elements other than carbon and hydrogen. All flares must be designed and operated in accordance with the following:	N/A. There are no flares at this site.

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(A) Meet specifications for minimum heating values of waste gas, maximum tip velocity, and pilot flame monitoring found in 40 CFR §60.18; (B) If necessary to ensure adequate combustion, sufficient gas shall be added to make the gases combustible; (C) An infrared monitor is considered equivalent to a thermocouple for flame monitoring purposes; (D) An automatic ignition system may be used in lieu of a continuous pilot; (E) Flares must be lit at all times when gas streams are present; (F) Fuel for all flares shall be sweet gas or liquid petroleum gas except where only field gas is available and it is not sweetened at the site; and (G) Flares shall be designed for and operated with no visible emissions, except for periods not to exceed at total of 5 minutes during any two consecutive hours. Acid gas flares which must comply with opacity limits and records in accordance with 30 TAC §111.111(a)(4), Requirements for Specified Sources, regarding gas flares, are exempt from this visible emission limitation. (H) Flares may be designed with steam or air assist to help reduce visible emissions from the flare but must meet the appropriate requirements in 40 CFR 60.18. (I) At no time shall minimum heating values fall below the associated minimum heating value in 60.18.	
(e)(12) Thermal oxidation and vapor combustion control devices may claim design destruction efficiency from 90 to 99.9% for VOCs and H₂S depending on the design and the level of monitoring and testing applied. A device designed for the variability of the waste gas streams it controls with basic monitoring to indicate oxidation or combustion is occurring when waste gas is directed to the device may claim 90% destruction efficiency. Devices with intermediate monitoring, designed for the variability of the waste gas streams they control, with a fire box or fire tube designed to maintain a temperature above 1,400 degrees Fahrenheit (F) for 0.5 seconds, residence time; or designed to meet the parameters of a flare with minimum heating values of waste gas, maximum tip velocity, and pilot flame monitoring as found in 40 CFR §60.18, but within a full or partial enclosure may claim a design destruction efficiency of 90 to 98%. Devices with enhanced monitoring and ports and platforms to allow stack testing may claim a 99% efficiency where the devices are designed for the variability of the waste gas streams they control, with a fire box or fire tube designed to maintain a temperature above 1,400 degrees F for 0.5 seconds, residence time. The devices that can claim 99% destruction efficiency may claim 99.9% destruction efficiency if stack testing is conducted and confirms the efficiency and the enhanced monitoring is adjusted to ensure the continued efficiency. Temperature and residence time requirements may be modified if stack testing is conducted to confirm efficiencies.	N/A. There are no thermal oxidation or vapor combustion control devices at the facility.
(f) Registration, Revision, and Renewal Requirements	
(f)(1) For all previous claims of this standard permit (or any previous version of this standard permit) existing authorized facilities, or group of facilities, are not required to meet the requirements of this standard permit, with the exception of planned MSS, until a renewal under the standard permit is submitted after December 31, 2015.	All authorized facilities under this standard permit will meet the applicable requirements of this standard permit.
(f)(2) If no other changes except for authorizing planned MSS occurs at an existing OGS under this standard permit, or any previous version of this standard permit, (b)(7) applies. (A) Records demonstrating compliance with paragraph (i) must be kept; (B) If the OGS must certify emissions to establish nonapplicability of prevention of significant deterioration (PSD), nonattainment new source review (NNSR), or the federal operating permit programs, this certification may be filed using Form APD-CERT. No fee is required for this certification. (C) Planned MSS shall be incorporated at the next revision or update to a registration under this standard permit after January 5, 2012, and no later than any renewal submitted after December 31, 2015.	This is an existing site authorized by this standard permit. Planned MSS emissions are quantified and included in this registration.
(f)(3) Facilities, groups of facilities or planned MSS from facilities registered under this standard permit cannot also be authorized by a permit under 30 TAC §116.111, General Application.	No facilities included in this authorization request are permitted separately under 30 TAC §116.111.

**Charlie Brown Compressor Station
Targa Midstream Services LLC
TCEQ Oil and Gas Non-Rule Standard Permit
July 2024**

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(f)(4) Prior to construction or implementation of changes for any project which meets this standard permit a notification shall be submitted through the e-Permits system. This notification shall include the following: (A) Identifying information (Core Data) and a general description of the project must be submitted through e-Permits (or if not available, hard-copy) using the "APD OGS New Project Notification." (B) A fee of \$25 for small businesses as defined in 30 TAC §106.50, or \$50 for all others must be submitted through the commission's e-Pay system.	The company submitted the required notification and paid the required fee.
(f)(5) For any registration which meets the emission limitations of this standard permit must meet the following: (A) Within 90 days after start of operation or implemented changes (whichever occurs first), the facilities must be registered with a PI-1S Standard Permit Application. (B) This registration shall include a detailed summary of maximum emissions estimates based on: site-specific or defined representative gas and liquid analysis; equipment design specifications and operations; material type and throughput; and other actual parameters essential for accuracy for determining emissions and compliance with all applicable requirements of this standard permit. (C) The fee for this registration shall be \$475 for small businesses, or \$850 for all others.	The company has submitted the required information and fee. The application is being submitted through the e-Permits system in accordance with TCEQ guidelines.
(D) Construction may begin any time after receipt of written notification to the executive director. Operations may continue after receipt of registration if there are no objections or 45 days after receipt by the executive director of the registration, whichever occurs first.	
(f)(6) If an OGS emissions increase, either through a change in production or addition of facilities, the site may change authorization (Level 1 or Level 2 PBR in 30 TAC §106.352 or Standard Permit) in the following circumstances: (A) Within 90 days from the initial notification of construction of an oil and gas facility, a registration can update the authorization mechanism by submitting an initial registration or revision to the PBR or Standard Permit. (B) Within 90 days of the change of production or installation of additional equipment, by submitting an initial registration or revision to the PBR or Standard Permit.	N/A. The company is not changing the authorization mechanism requested in the initial notification.
(f)(7) All registrations, registration revisions, and renewals shall be submitted to the commission through a PI-1S Standard Permit Registration Form. Fee requirements do not apply when there are changes in representations with no increase in emissions within 6-months after a standard permit registration has been issued.	All required information and fees are included as part of this application. The application is being submitted through the e-Permits system in accordance with TCEQ guidelines.
(g) Any claim under this standard permit must comply with all applicable requirements of 30 TAC §116.610; §116.611, Registration to Use a Standard Permit; §116.614, Standard Permit Fees; and §116.615, General Conditions. This standard permit supersedes: the notification requirements of 30 TAC §116.615, General Conditions; and the emission limitations of 30 TAC §116.610(a)(1), Applicability.	This standard permit application complies with the applicable requirements of paragraph (g).
(h) Emission Limitations. Total maximum estimated registered or certified emissions shall meet the most stringent of the following. All emissions estimates must be based on representative worst-case operations and planned MSS activities.	
(h)(1) Total maximum estimated annual emissions of any air contaminant shall not exceed the applicable limits for a major stationary source or major modification for PSD and NNSR as specified in 30 TAC §116.12.	Emissions do not exceed any of the specified limits. Please see the emissions summary table in Section 1 for details.
(h)(2) Emissions must meet the limitations established in paragraph (k) of this standard permit.	Emissions meet the limits established by paragraph (k). Please see Section 1 and Section 4 for details.

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(h)(3) <i>Maximum emissions are limited to less than the following after any operator limitations or controls:</i> <table><tr><th>Air Contaminant</th><th>steady state lbs/hr</th><th>< 30 psig periodic lbs/hr</th><th>≥ 30 psig periodic lbs/hr up to 600 hr/yr</th><th>Total tpy</th></tr><tr><td>Total VOC</td><td></td><td></td><td></td><td>250</td></tr><tr><td>Total crude oil or condensate VOC</td><td>145</td><td>145</td><td>318</td><td></td></tr><tr><td>Total natural gas VOC*</td><td>750</td><td>750</td><td>1635</td><td></td></tr><tr><td>Benzene</td><td>7</td><td>7</td><td>15.4</td><td>10.2</td></tr><tr><td>Hydrogen sulfide</td><td>10.8</td><td>10.8</td><td>9.8</td><td>47</td></tr><tr><td>Sulfur dioxide</td><td>93.2</td><td>93.2</td><td></td><td>250</td></tr><tr><td>Nitrogen oxides</td><td>121</td><td>121</td><td></td><td>250</td></tr><tr><td>Carbon monoxide</td><td>104</td><td>104</td><td></td><td>250</td></tr><tr><td>PM10 and PM2.5</td><td>28</td><td>28</td><td></td><td>15</td></tr></table> <i>* VOC is defined in 101.1(115) and does not include methane and ethane</i>					Air Contaminant	steady state lbs/hr	< 30 psig periodic lbs/hr	≥ 30 psig periodic lbs/hr up to 600 hr/yr	Total tpy	Total VOC				250	Total crude oil or condensate VOC	145	145	318		Total natural gas VOC*	750	750	1635		Benzene	7	7	15.4	10.2	Hydrogen sulfide	10.8	10.8	9.8	47	Sulfur dioxide	93.2	93.2		250	Nitrogen oxides	121	121		250	Carbon monoxide	104	104		250	PM10 and PM2.5	28	28		15	As shown in the Emission Summary provided in Section 1, this site complies with the emission rate limits in paragraph (h). The emission rates do not exceed the PSD major source thresholds, the project emissions comply with the limits of paragraph (k), and the emission rates do not exceed the rates presented in the table to the left. Please see Section 3 for hourly and annual emissions calculations and Section 4 for impacts analyses.
Air Contaminant	steady state lbs/hr	< 30 psig periodic lbs/hr	≥ 30 psig periodic lbs/hr up to 600 hr/yr	Total tpy																																																			
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Nitrogen oxides	121	121		250																																																			
Carbon monoxide	104	104		250																																																			
PM10 and PM2.5	28	28		15																																																			
(i) Planned Maintenance, Start-ups and Shutdowns (MSS) . For any facility, group of facilities or site using this standard permit or previous versions of this standard permit, the following shall apply:																																																							
(i)(1) <i>Prior to January 5, 2012, representations and registration of planned MSS is voluntary, but if represented must meet the applicable limits of this standard permit. After January 5, 2012, all emissions from planned MSS activities and facilities must be considered for compliance with applicable limits of this standard permit unless otherwise specified in (b)(7). This standard permit may not be used at a site or for facilities authorized under 30 TAC §116.111 if planned MSS has already been authorized under that permit.</i>					Planned MSS emissions are quantified and included in this registration.																																																		
(i)(2) <i>As specified, releases of air contaminants during, or as result of, planned MSS must be quantified and meet the emission limits in this standard permit, as applicable. This analysis must include:</i> (A) <i>Alternate operational scenarios or redirection of vent streams;</i> (B) <i>Pigging, purging, and blowdowns;</i> (C) <i>Temporary facilities if used for degassing or purging of tanks, vessels, or other facilities;</i> (D) <i>Degassing or purging of tanks, vessels, or other facilities; and</i> (E) <i>Management of sludge from pits, ponds, sumps, and water conveyances.</i>					Planned MSS emissions are quantified and included in this registration.																																																		
(i)(3) <i>Other planned MSS activities authorized by this standard permit are limited to the following. These planned MSS activities require only recordkeeping of the activity.</i> (A) <i>Routine engine component maintenance including filter changes, oxygen sensor replacements, compression checks, overhauls, lubricant changes, spark plug changes, and emission control system maintenance.</i> (B) <i>Boiler refractory replacements and cleanings.</i> (C) <i>Heater and heat exchanger cleanings.</i> (D) <i>Turbine hot standard permit swaps.</i> (E) <i>Pressure relief valve testing, calibration of analytical equipment; Instrumentation/analyzer maintenance; replacement of analyzer filters and screens.</i>					Records will be kept for planned MSS emissions which are not required to be quantified.																																																		
(i)(4) <i>Engine/compressor start-ups associated with preventative system shutdown activities have the option to be authorized as part of typical operations if:</i> (A) <i>Prior to operation, alternative operating scenarios to divert gas or liquid streams are registered and certified with all supporting documentation;</i> (B) <i>Engine/compressor shutdowns shall result in no greater than 4 lbs/hr of natural gas emissions; and</i> (C) <i>Emissions which result from subsequent compressor start-up activities are controlled to a minimum of 98% efficiency for VOC and H₂S.</i>					N/A. The company is not including engine/compressor start-ups associated with preventative system shutdown activities in this registration.																																																		

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(j) Records, Sampling and Monitoring. <i>The following records shall be maintained at a site in written or electronic form and be readily available to the agency or local air pollution control program with jurisdiction upon request. All required records must be kept at the facility site. If the facility normally operates unattended, records must be maintained at an office within Texas having day-to-day operational control of the plant site. Other requirements, including but not limited to, federal recordkeeping or testing requirements, can be used to demonstrate compliance if the other requirements are at least as stringent as the associated requirements in the table below. Any documentation that is already being kept for other purposes will suffice for demonstrating requirements. If a control or method is not relied upon to meet this standard permit, then the associated sampling, monitoring, and records are not applicable.</i>	All specified records will be maintained.										
(j)(1) <i>Sampling and demonstrations of compliance shall include the requirements listed in Table 7 in paragraph (m) of this standard permit.</i>	The company will comply with all applicable sampling and compliance demonstration requirements in Table 7 and paragraph (m).										
(j)(2) <i>Monitoring and records for demonstrations of compliance shall include the requirements listed in Table 8 in paragraph (m) of this standard permit.</i>	The company will comply with all applicable monitoring and compliance demonstration record requirements in Table 8 and paragraph (m).										
(k) Emission Limits Based on Impacts Evaluation.											
(k)(1) <i>All impacts evaluations must be completed on a contaminant-by-contaminant basis for only any net emissions increases resulting from a project and must meet the following as appropriate:</i> (A) <i>Compliance with state or federal ambient air standards shall be demonstrated for NO₂, SO₂, and H₂S at any property-line within one mile of a project.</i> (B) <i>Compliance with hourly effects screening levels (ESLs) for benzene and annual ESL for benzene, shall be demonstrated at the nearest receptor within 1 mile of a project.</i>	All required impacts evaluations have been completed. Please see Section 4 for details.										
(k)(2) <i>Distance measurements shall be determined using the following:</i> (A) <i>For each facility or group of facilities, the shortest corresponding distance from any emission point, vent, or fugitive component to the nearest receptor must be used with the appropriate compliance determination method with the published ESLs as found through the TCEQ internet webpage.</i> (B) <i>For each facility or group of facilities, the shortest corresponding distance from any emission point, vent, or fugitive component to the nearest property line must be used with the appropriate compliance determination method with any applicable state or federal ambient air quality standard.</i>	Distance measurements were made as specified.										
(k)(3) <i>Impacts evaluations are not required under the following cases:</i> (A) <i>If there is no receptor within 1 mile of a registration no further ESL review is required.</i> (B) <i>If there is no property line within 1 mile of a registration no further ambient air quality review is required.</i> (C) <i>If the project total emissions are less than any of the following rates, no additional analysis or demonstration of the specified air contaminant is required:</i> <table border="1"> <thead> <tr> <th>Air contaminant</th><th>lb/hr</th></tr> </thead> <tbody> <tr> <td>Benzene</td><td>0.039</td></tr> <tr> <td>Hydrogen sulfide</td><td>0.025</td></tr> <tr> <td>Sulfur dioxide</td><td>2</td></tr> <tr> <td>Nitrogen oxides</td><td>4</td></tr> </tbody> </table>	Air contaminant	lb/hr	Benzene	0.039	Hydrogen sulfide	0.025	Sulfur dioxide	2	Nitrogen oxides	4	All required impacts evaluations have been completed. Please see Section 4 for details.
Air contaminant	lb/hr										
Benzene	0.039										
Hydrogen sulfide	0.025										
Sulfur dioxide	2										
Nitrogen oxides	4										
(k)(4) <i>Evaluation of emissions shall meet the following.</i> (A) <i>For all evaluations of NO_x to NO₂ a conversion factor of 0.20 for 4 stroke rich and lean burn engines and 0.50 for 2-stroke engines may be used.</i> (B) <i>The maximum predicted concentration or rate at the property boundary or receptor, whichever is appropriate, must not exceed a state or federal ambient air standard or ESL.</i>	The specified NO_x to NO₂ conversion factors were used. Applicable state or federal ambient air standards or ESLs have not been exceeded. Please see Section 4 for details.										

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Standard Permit Requirement	Company Response
(k)(5) <i>The impacts analysis shall be based on the following facility emissions:</i> (A) <i>The following shall be met for ESL reviews: (i) If a project's air contaminant maximum predicted concentrations are equal to or less than 10% of the appropriate ESL, no further review is required; (ii) If a project's air contaminant maximum predicted concentrations combined with project increases for that contaminant over a rolling 60-month period after the effective date of this revised standard permit are equal to or less than 25% of the appropriate ESL, no further review is required. (iii) In all other cases, all facility emissions at an OGS, regardless of authorization type, located within 1 mile of a project requiring registration under this standard permit shall be evaluated.</i> (B) <i>The following shall be met for state and federal ambient air quality standard reviews: (i) If a project's air contaminant maximum predicted concentrations are equal to or less than 10% the significant impact level (SIL) (also known as de minimis impact in 30 TAC 101, General Rules), no further review is required; (ii) In all other cases, all facility emissions at an OGS, regardless of authorization type, located within 1 mile of a project requiring registration under this standard permit shall be evaluated.</i>	Impacts analyses were completed as specified in Section 4.
(k)(6) <i>Evaluation must comply with one of the methods listed with no changes or exceptions:</i> (A) <i>Tables. (i) Emission impact Tables 2 – 5F in paragraph (m) of this standard permit may be used in accordance with the limits and descriptions in Table 1 in paragraph (m). (ii) Values in Tables 2 - 5F in paragraph (m) of this standard permit may be used with linear interpolation between height and distance points. A distance of less than 50 feet or greater than 5,500 feet may not be used. Release heights may not be extrapolated beyond the limits of any table and instead the minimum or maximum height will be used. If distances and release heights are not interpolated, the next lowest height and lesser distances shall be used for determination of maximum acceptable emissions. All facilities exempted from the distance to the property line restriction in paragraph (e)(2) of this standard permit must use 50 feet as the distance to the property line for those ambient standards based on property line.</i> (B) <i>Screening Modeling. A screening model may be used to demonstrate acceptable emissions from an OGS under this standard permit if all of the parameters in the screening modeling protocol provided by the commission are met.</i> (C) <i>Dispersion Modeling. A refined dispersion model may be used to demonstrate acceptable emissions from an OGS under this standard permit if all of the parameters in the refined dispersion modeling protocol provided by the commission are met.</i>	Evaluation of impacts was completed as specified. Please see Section 4 for details.

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Table 10 - Best Available Control Technology (BACT) Requirements

Source or Facility	Air Contaminant	Minimum Acceptable Design, Control or Technique, Control Efficiencies, and Other Details during Production Operations	Company Response
<i>Combined Control Requirements</i>	<i><25 tpy VOC</i>	<i>No add on control is required if the continuous and periodic vents from all units, vessels and equipment (including normal operation process blow downs) is less than 25 tons of VOC per year.</i>	Site-wide emissions are < 25 tpy VOC; therefore, no add on controls are required.
	<i>≥25 tpy VOC</i>	<i>All continuous and periodic vents on process vessels and equipment with potential emissions containing ≥ 1% VOC at any time must be captured and directed to a control device listed in the Control Device BACT Table with a minimum design control efficiency of at least 95%, if the sum of the uncontrolled PTE of the vents at the site will equal or exceed 25 tons of VOC per year. A site total potential to emit of 1 tpy of VOC from vent gas streams may be exempted from this control requirement.</i>	0
<i>Glycol Dehydration Unit</i>	<i>Uncontrolled PTE <10 tpy VOC</i>	<i>No control is required. Condensers included in the equipment constructed must be maintained and operated as specified by the manufacturer or design engineering.</i>	The uncontrolled PTE is greater than 50 tpy VOC; therefore all non-combustion VOC emissions will be captured and directed to a control device with at least 95% control efficiency.
	<i>VOC, BTEX, H₂S</i>		
	<i>Uncontrolled PTE ≥10 tpy and <50 tpy VOC</i>	<i>All non-combustion VOC emissions shall be routed to a vapor recovery unit (VRU), the unit reboiler, or to an appropriate control device listed in the Control Device BACT Table. This includes the emissions from the condenser vent. Liquid waste or product material captured by a condenser must be enclosed and transferred to a unit compliant with the requirements of this table and the condenser must meet the requirements listed in the Control Device BACT Table with a minimum design control efficiency of 80%. For condensers, greater efficiencies may be claimed where enhanced monitoring and testing are applied following Table 7.</i> <i>If the unit reboiler is used to control the VOC emissions from the dehydrator (e.g. to control the condenser vent and the flash tank if one is present) the unit must be designed to efficiently combust those vented VOCs at least 50% of the time the unit is operated.</i>	
	<i>Uncontrolled PTE ≥50 tpy VOC</i>	<i>All non-combustion VOC emissions shall be captured and directed to an appropriate control device listed in the Control Device BACT Table with a minimum design control efficiency of at least 95%.</i>	
	<i>VOC, BTEX, H₂S</i>		

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Table 10 - Best Available Control Technology (BACT) Requirements

Source or Facility	Air Contaminant	Minimum Acceptable Design, Control or Technique, Control Efficiencies, and Other Details during Production Operations	Company Response
<i>Atmospheric Oil/Water separators</i>	<i>VOC with partial pressure <0.5 psia at max liquid temp. or 95 F whichever is greater.</i> <i>VOC, BTEX, H₂S</i>	<i>May vent to atmosphere through vent no larger than 3 inch diameter. If H₂S can exceed 24 ppmv in the vapor space the separator vent shall be captured and directed to a control device listed in the Control Device BACT Table with a minimum design control efficiency of at least 95%.</i>	N/A. There are no atmospheric oil/water separators at this site.
	<i>VOC with partial pressure ≥0.5 psia at max liquid surface temperature or 95 F whichever is greater.</i> <i>VOC, BTEX, H₂S</i>	<i>The oil layer must have a floating cover over the entire liquid surface with a conservation vent to atmosphere or the vents must be captured and directed to a control device listed in the Control Device BACT Table with a minimum design control efficiency of at least 95%. If H₂S can exceed 24 ppmv in the vapor space the separator vent shall be captured and directed to a control device listed in the Control Device BACT Table with a minimum design control efficiency of at least 95%. If the separator operates with more than 25,000 gallons (595 barrels) of liquid contained or is used as an oil storage tank, it shall be treated as a storage tank and meet those requirements.</i>	
	<i>Oil water separators where the material entering the separator may flash.</i> <i>VOC, BTEX, H₂S</i>	<i>These separators must be treated as process separators with a gas stream and follow those requirements.</i>	
<i>Fuel Combustion Units including auxiliary fuel for combustion control devices</i>	<i>H₂S</i>	<i>Fuel for all combustion units at the site shall be sweet natural gas or liquid petroleum gas, fuel gas containing no more than ten grains of total sulfur per 100 dry standard cubic feet (dscf), or field gas.</i>	Fuel gas containing no more than ten grains of sulfur per 100 dscf (≤160 ppmv H ₂ S) or sweet natural gas (≤24 ppmv H ₂ S) or field gas will be used as fuel for all natural gas-fired combustion units.

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Table 10 - Best Available Control Technology (BACT) Requirements

Source or Facility	Air Contaminant	Minimum Acceptable Design, Control or Technique, Control Efficiencies, and Other Details during Production Operations	Company Response
<i>Boilers, Reboilers, Heater-Treaters, and Process Heaters</i>	<i>NO_x, CO, PM_{10/2.5}, VOC, HCHO, SO₂</i>	<i>If any unit has a designed maximum firing rate of <40 MMBTU/hr and >10 MMBtu/hr, it must be designed and operated for good combustion and meet 0.10 lb/MMBtu for NO_x. For boilers and reboilers ≥40 MMBtu/hr, emission shall not exceed 0.036 lb/MMBtu for NO_x. For heaters and heater treaters ≥40 MMBtu/hr but <100 MMBtu/hr, emissions shall not exceed 0.06 lb/MMBtu for NO_x. Heaters and heater treaters ≥100 MMBtu/hr shall not exceed 0.036 lb/MMBtu for NO_x. For boilers, reboilers, process heaters, and heater treaters with heat inputs ≥10 MMBtu/hr, the emission limit for CO is 0.074 lb CO/MMBtu.</i>	N/A. All units have a designed maximum firing rate of ≤ 10 MMBtu/hr.
<i>Gas Fired Turbines</i>	<i>NO_x, CO, PM_{10/2.5}, VOC, HCHO, SO₂</i>	<i>Units shall be designed and operate with low NO_x combustors and meet 25 ppmvd @ 15% O₂ for NO_x and 50 ppmvd @ 15% O₂ for CO.</i>	N/A. There are no gas fired turbines at this site.
<i>All Tanks</i>	<i>Uncontrolled PTE of <1.0 tpy VOC or <0.1 tpy H₂S</i>	<i>Open-topped tanks or ponds containing VOCs or H₂S are allowed</i>	N/A. There are no open-topped tanks or ponds at this site.
	<i>Uncontrolled PTE of ≥1.0 tpy VOC or ≥0.1 tpy H₂S</i>	<i>Open-topped tanks or ponds containing VOCs or H₂S are not allowed. Tank hatches and valves, which emit to the atmosphere, shall remain closed except for sampling or planned maintenance activities. All pressure relief devices (PRD) shall be designed and operated to ensure that proper pressure in the vessel is maintained and shall stay closed except in upset or malfunction conditions. If the PRD does not automatically reset, it must be reset within 24 hours at a manned site and within one week if located at an unmanned site.</i>	All tanks with an uncontrolled PTE of ≥1.0 tpy VOC or ≥0.1 tpy H ₂ S will be operated and maintained as specified.

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Table 10 - Best Available Control Technology (BACT) Requirements

Source or Facility	Air Contaminant	Minimum Acceptable Design, Control or Technique, Control Efficiencies, and Other Details during Production Operations	Company Response
<i>Process Separators, Crude oil, Condensate, Treatment chemicals, Produced water, Fuel, Slop/Sump Oil and any other storage tanks or vessels that contain a VOC or a film of VOC on the surface of water.</i>	<i>VOC with partial pressure <0.5 psia at max liquid surface temp. or 95 F whichever is greater, or w/ uncontrolled PTE of <5 tpy VOC from working and breathing losses, including flash emissions.</i> <i>VOC, BTEX, H₂S</i>	<i>All storage tanks with a storage capacity >500 gallons must be submerged fill. Existing tanks and vessels (including temporary liquid storage tanks) which are not increasing emissions at an OGS shall also meet this requirement no later than 180 days after a registration renewal as of January 1, 2016.</i>	Tanks, vessels, and separators more than 500 gallons in size, containing VOC with a maximum partial pressure <0.5 psia, or with an uncontrolled PTE <5 tpy VOC, will use submerged filling.
	<i>VOC with partial pressure ≥0.5 psia at max liquid surface temp. or 95 F whichever is greater, and w/ uncontrolled PTE of <5 tpy from working and breathing losses, including flash emissions.</i> <i>VOC, BTEX, H₂S</i>	<i>All storage tanks with a storage capacity >500 gallons must be submerged fill. Un-insulated tank exterior surfaces exposed to the sun shall be of a color that minimizes the effects of solar heating (including, but not limited to, white or aluminum). To meet this requirement the solar absorptance should be 0.43 or less, as referenced in Table 7.1-6 in AP-42. Paint shall be maintained in good condition. If a new or modified tank cannot be painted white or other reflective color, then another control device may be used to control emissions. Exceptions to the color requirement include the following: (A) Up to 10% of the external surface area of the roof or walls of the tank or vessel may be painted with other colors to allow for identifying information or aesthetic purposes; and (B) If a local, state or federal law or ordinance or private contract which predates this standard permit's effective date establishes in writing tank and vessel colors other than white. If applicable, a copy of this documentation must be provided to the commission upon registration. (C) Tanks and vessels purposefully darkened to create the process reaction and help condense liquids from being entrained in the vapor. Existing tanks and vessels (including temporary liquid storage tanks) which are not increasing emissions at an OGS using shall also meet this requirement no later than 180 days after a registration renewal as of January 1, 2016.</i>	Tanks, vessels, and separators having a storage capacity >500 gallons in size, containing VOC with a maximum partial pressure ≥0.5 psia, and with an uncontrolled PTE <5 tpy VOC, will use submerged filling and will be of a color to minimize solar heating and/or will use a control device to control emissions.

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Table 10 - Best Available Control Technology (BACT) Requirements

Source or Facility	Air Contaminant	Minimum Acceptable Design, Control or Technique, Control Efficiencies, and Other Details during Production Operations	Company Response
<i>Process Separators, Crude oil, Condensate, Treatment chemicals, Produced water, Fuel, Slop/Sump Oil and any other storage tanks or vessels that contain a VOC or a film of VOC on the surface of water.</i>	<i>VOC with uncontrolled PTE of ≥ 5 tpy</i>	<i>Vents shall be captured and directed to an appropriate control device as listed in standard permit (e) BMP and BACT. Un-insulated tank exterior surfaces exposed to the sun shall be of a color that minimizes the effects of solar heating (including, but not limited to, white or aluminum). To meet this requirement the solar absorptance should be 0.43 or less, as referenced in Table 7.1-6 in AP-42. Paint shall be maintained in good condition. Exceptions to the color requirement include the following:</i> <i>(A) Up to 10% of the external surface area of the roof or walls of the tank or vessel may be painted with other colors to allow for identifying information or aesthetic purposes; and</i> <i>(B) If a local, state or federal law or ordinance or private contract which predates this standard permit's effective date establishes in writing tank and vessel colors other than white. If applicable, a copy of this documentation must be provided to the commission upon registration.</i> <i>(C) Tanks and vessels purposefully darkened to create the process reaction and help condense liquids from being entrained in the vapor. Existing tanks and vessels (including temporary liquid storage tanks) which are not increasing emissions at an OGS using shall also meet this requirement no later than 180 days after a registration renewal as of January 1, 2016.</i>	Tanks, vessels, and separators with an uncontrolled PTE ≥ 5 tpy VOC will use an approved control device and will be of a color to minimize solar heating or utilize alternate control.
<i>Truck Loading</i>	<i>VOC with partial pressure < 0.5 psia at max liquid surface temp. or 95 F whichever is greater, or w/ uncontrolled PTE of < 5 tpy VOC.</i> <i>VOC, BTEX, H_2S</i>	<i>Loading is recommended to be performed with submerged filling, or vapor balancing back to the tank and any subsequent recovery or control device.</i>	Truck loading of VOC materials with a partial pressure < 0.5 psia at the maximum temperature, or loading operations with an uncontrolled PTE < 5 tpy VOC will be performed using submerged fill.

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Table 10 - Best Available Control Technology (BACT) Requirements

Source or Facility	Air Contaminant	Minimum Acceptable Design, Control or Technique, Control Efficiencies, and Other Details during Production Operations	Company Response
<i>Truck Loading</i>	<i>VOC with partial pressure ≥ 0.5 psia at max liquid surface temp. or 95 F whichever is greater.</i> <i>VOC, BTEX, H₂S</i>	<i>Splash loading and uncontrolled vacuum truck loading is not allowed. Loading shall be performed with a control effectiveness of at least 42% as compared to splash loading. Loading may occur by submerged filling or equivalent prevention or recovery technique as listed in Table 10.</i>	Truck loading of VOC materials with a partial pressure ≥ 0.5 psia at the maximum temperature will be performed using submerged fill. Splash loading will not occur.
	<i>VOC with uncontrolled PTE of ≥ 5 tpy VOC.</i> <i>VOC, BTEX, H₂S</i>	<i>Loading vapors shall be captured and directed to an appropriate control device listed in the Control Device BACT Table with a minimum design control efficiency of at least 98%, routed to a vapor recovery unit (VRU) with a control effectiveness of at least 95%, or vapor balanced back to the delivering storage tank equipped with a VRU, or connected to a control device listed in the Control Device BACT Table with a minimum design control efficiency of at least 95%.</i>	Truck loading operations have an uncontrolled PTE < 5 tpy VOC; therefore, there are no control requirements.
<i>Controlled Loading</i>		<i>Where loading control is required, the collection or capture system must be connected to the tank truck so all displaced vapors are directed to the control device and the control device is operational before loading is commenced. When properly connected the capture efficiency will be assumed to be 70% efficient at capturing the displaced truck vapors. The capture efficiency may be assumed to be 98.7 percent efficient when the tanker truck has certification that the tank has passed vapor-tightness testing within the last 12 months using the methods described in 40 CFR 60, Subpart XX. The capture efficiency may be assumed to be 99.2 percent efficient when the tanker truck has certification that the tank has passed vapor-tightness testing within the last 12 months using the methods described in 40 CFR 63, Subpart R. Loading shall be discontinued when liquid or gas leaks from the loading or collection system are observed.</i>	Controlled loading is not required.

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Table 10 - Best Available Control Technology (BACT) Requirements

Source or Facility	Air Contaminant	Minimum Acceptable Design, Control or Technique, Control Efficiencies, and Other Details during Production Operations	Company Response
Cooling Tower Heat Exchange System	VOC, BTEX, PM _{10/2.5}	Heat exchange systems must be non-contact design (i.e. designed and operated to avoid direct contact with gaseous or liquid process streams containing VOC, H₂S, halogens or halogen compounds, cyanide compounds, inorganic acids, or acid gases). Systems with heat exchangers that cool a fluid with VOC shall meet the following: The cooling water must be at a higher pressure than the process fluid in the heat exchangers or the cooling tower water must be monitored monthly for VOC emissions using TCEQ Sampling Procedures Manual, Appendix P dated January 2003 or a later edition. Equipment shall be maintained so as to minimize VOC emissions into the cooling water. Cooling water VOC concentrations greater than 0.08 ppmw indicate faulty equipment. If the repair of a heat exchanger would require a unit shutdown that would create more emissions than the repair would eliminate, the repair may be delayed until the next planned shutdown or 180 days if no shutdowns are scheduled. Cooling towers shall be designed and operated with properly functioning drift eliminators. New cooling towers shall be designed with drift eliminators designed to meet ≤0.001% drift.	N/A. There are no cooling tower heat exchange systems at this site.

Charlie Brown Compressor Station
Targa Midstream Services LLC
TCEQ Oil and Gas Non-Rule Standard Permit
July 2024

State Regulation Applicability

Section 5.5

30 TAC		Rule	Applicable (Yes/No)	Company Response
Chapter 101	Subchapter A	General Rules	Yes	This site will comply with all applicable general rules of this Subchapter.
	Subchapter F, Division 1	Emission Events	Yes	If an unauthorized emission event occurs, all required records will be maintained, and all required reports will be submitted.
	Subchapter H, Division 3	Mass Emissions Cap and Trade Program	No	This site is not located in the HGB ozone nonattainment area.
Chapter 111	Subchapter A, Division 1	Visible Emissions	Yes	There are no sources subject to this division located at this site.
	Subchapter A, Division 5	Emission Limits on Nonagricultural Processes	Yes	This site will comply with the applicable PM emission limits specified in this division.
Chapter 112	Subchapter A	Control of Sulphur Dioxide	Yes	Emissions of SO ₂ will comply with all applicable requirements of this chapter.
	Subchapter B	Control of Hydrogen Sulfide	Yes	Emissions of H ₂ S will comply with all applicable requirements of this chapter.
Chapter 113	Subchapter B	National Emission Standards for Hazardous Air Pollutants (FCAA, §112, 40 CFR Part 61)	No	This site is not subject to 40 CFR 61, Subpart R. Therefore, it is not subject to this subchapter.
	Subchapter C	National Emission Standards for Hazardous Air Pollutants for Source Categories (FCAA, §112, 40 CFR Part 63)	Yes	This chapter addresses the control of hazardous air pollutants. The site will comply with all applicable standards of performance for hazardous air pollutants, as described in the Federal Regulation section.
Chapter 115	Subchapter B, Division 1	Storage of Volatile Organic Compounds	No	This site is not located in a county subject to this division of Chapter 115.

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State Regulation Applicability

Section 5.5

30 TAC		Rule	Applicable (Yes/No)	Company Response
Chapter 115	Subchapter B, Division 2	Vent Gas Control	No	Not applicable. There are no vents subject to this Division at this site.
Chapter 115	Subchapter B, Division 7	Oil and Natural Gas Service in Ozone Nonattainment Areas	No	Not applicable. This site is not located in the HGB or DFW ozone nonattainment areas.'
Chapter 115	Subchapter C, Division 1	Loading and Unloading of Volatile Organic Compounds	No	Not applicable. This site is not a gasoline terminal and/or is not located in the BPA, DFW, or HGB areas.
Chapter 117	Subchapter B	Combustion Control at Major Industrial, Commercial, and Institutional Sources in Ozone Nonattainment Areas	No	Not applicable. There are no potentially affected sources at this site.
	Subchapter D	Combustion Control at Minor Sources in Ozone Nonattainment Areas	No	Not applicable. There are no potentially affected sources at this site.
Chapter 122	Subchapter B	Federal Operating Permits Program - Permit Requirements	Yes	The site is an existing major source as defined in §122.10 of this title and currently operates under GOP 152619. This permit will be updated as necessary to accommodate this project.

**Charlie Brown Compressor Station
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Federal Regulation Applicability

Section 5.6

Title 40 CFR Part 60 – New Source Performance Standards (NSPS)

NSPS Subpart	Rule Title	Applicable (Yes/No)	Company Response
Subpart A	General Provisions	Yes	This site is subject to a NSPS and is, therefore, subject to the general provisions of this subpart.
Subpart Db	Standards of Performance for Industrial-Commercial Institutional Steam Generating Units	No	This site does not operate a steam generating unit as defined in this subpart; therefore, this subpart does not apply.
Subpart Dc	Standards of Performance for Small Industrial-Commercial Institutional Steam Generating Units	No	This site does not operate a steam generating unit as defined in this subpart; therefore, this subpart does not apply.
Subpart K	Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After June 11, 1973, and Prior to May 19, 1978	No	The storage tanks to be authorized by this project did not commence construction, reconstruction, or modification after June 11, 1973 and prior to May 19, 1978; therefore, this subpart does not apply.
Subpart Ka	Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After May 18, 1978 and Prior to July 23, 1984	No	The storage tanks to be authorized by this project did not commence construction, reconstruction, or modification after May 18, 1978 and prior to July 23, 1984; therefore, this subpart does not apply.
Subpart Kb	Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984	No	The storage tanks at the site commenced construction after July 23, 1984 and are used to store VOC liquid; however, each tank has a storage capacity less than 75 m ³ (472 bbl). Therefore, this subpart does not apply per §60.110b(a).
Subpart KKK	Standards of Performance for Equipment Leaks of VOC From Onshore Natural Gas Processing Plants for Which Construction, Reconstruction, or Modification Commenced After January 20, 1984, and on or Before August 23, 2011	No	This Site does not meet the definition of natural gas processing plant as defined in 40 CFR §60.631; therefore, this subpart does not apply.
Subpart JJJJ	Standards of Performance for Stationary Compression Ignition Internal Combustion Engine.	Yes	Engines at this site are subject to this subpart and will comply as applicable.
Subpart OOOO	Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution for which Construction, Modification, or Reconstruction Commenced after August 23, 2011, and on or before September 18, 2015	No	The applicability for affected facilities under this subpart, per §60.5365, is addressed below. Compliance with applicable requirements will be maintained within the required timeframes outlined in this subpart.

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July 2024

Federal Regulation Applicability

Section 5.6

NSPS Subpart	Rule Title	Applicable (Yes/No)	Company Response
Subpart OOOOa	Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification, or Reconstruction Commenced after September 18, 2015 and On or Before December 6, 2022	Yes	The applicability for affected facilities under this subpart, per §60.5365a, is addressed below. Compliance with applicable requirements will be maintained within the required timeframes outlined in this subpart.
		Yes	•<i>Centrifugal or Reciprocating Compressor:</i> Compressors RC-1 through RC-6 (driven by FIN/EPNs: CM-1 through CM-6) and RC-10 (driven by FIN/EPN: CM-10) are affected facilities under this subpart.
		No	•<i>Storage Vessel:</i> Storage vessels constructed within the specified timeframe do not have the potential to emit ≥6 tpy VOC; therefore, they are not affected facilities per §60.5365a(e) of this subpart.
		Yes	•<i>Collection of fugitive emission components:</i> This site is a compressor station, as defined in §60.5430a, modified after the applicability date; therefore, the collection of fugitive emissions components at this site is an affected facility per §60.5365a(j). Compliance with the applicable requirements will be maintained.
Subpart OOOOb	Standards of Performance for Crude Oil and Natural Gas Facilities for Which Construction, Modification or Reconstruction Commenced After December 6, 2022	No	Affected facilities at this site were constructed or modified after December 6, 2022. These facilities will comply with all applicable requirements.

Federal Regulation Applicability

Section 5.6

Title 40 CFR Part 61 – National Emission Standards for Hazardous Air Pollutants (NESHAP)

NESHAP Subpart	Rule Title	Applicable (Yes/No)	Company Response
Subpart A	General Provisions	No	The facilities authorized by this project are not subject to a NESHAP. Therefore, they are not subject to the general provisions of this subpart.
Subpart V	National Emission Standards for Equipment Leaks (Fugitive Emission Sources)	No	The facilities to be authorized by this project will not operate in volatile hazardous air pollutant service, as defined in §61.241 of this subpart; therefore, this subpart does not apply.

Title 40 CFR Part 63 – National Emission Standards for Hazardous Air Pollutants Maximum Achievable Control Technology (MACT)

MACT Subpart	Rule Title	Applicable (Yes/No)	Company Response
Subpart A	General Provisions	Yes	This site is subject to a MACT standard and is, therefore, subject to the general provisions of this subpart.
Subpart H	National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks	No	There are no other applicable MACT subparts that reference this subpart. Therefore, this subpart does not apply.
Subpart HH	National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities	Yes	This site is an area source of HAPs and operates a TEG dehydration unit, which is an affected source for area sources of HAPs. The unit is exempt from the requirements of §63.764(d) for area source of HAPs per §63.764(e)(ii) – Actual annual average emissions of benzene from the glycol dehydration process vent to atmosphere are less than 0.9 Mg/yr (1.0 tpy).
Subpart HHH	National Emission Standards for Hazardous Air Pollutants From Natural Gas Transmission and Storage Facilities	No	This subpart applies to natural gas transmission and storage facilities that transport or store natural gas prior to entering the pipeline to a local distribution company or to a final end user (if there is no local distribution company) and that are major sources of HAP emissions. This site is not a major HAP source; therefore, this subpart does not apply.
Subpart ZZZZ	National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines	Yes	Engines at this site as subject to this subpart and will comply with all applicable requirements.

Supporting Documentation



Bryan Research & Engineering, LLC

ProMax[®] 6.0

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Simulation Report

Project: CharlieBrownCondensate Tank.pmx

Licensed to Targa Resources, LLC and Affiliates

Client Name: Targa Resources

Location: Charlie Brown

Job:

T:\CorpData\Engineering & Operations\ES&H\Air\Permits\Texas\NSR and PBR Permits\SAOU Area\Charlie Brown CS\2024-06_CharlieBrownCS_NRSPRev_IncreaseThpt(2024-

ProMax Filename: 237)\05_WorkingFiles\ProMax\CharlieBrownCondensate Tank.pmx

ProMax Version: 6.0.23032.0

Simulation Initiated: 7/3/2024 9:04:24 AM

Bryan Research & Engineering, LLC

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P.O. Box 4747 Bryan, Texas 77805
Office: (979) 776-5220
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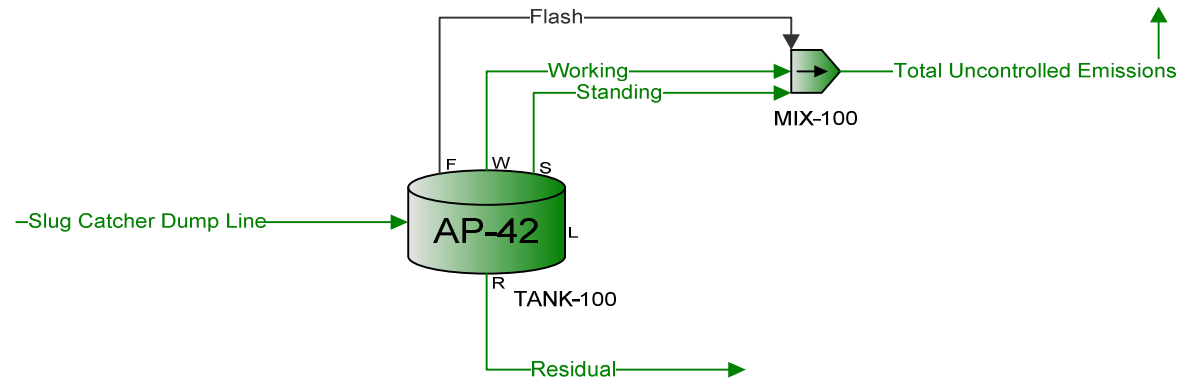
Report Navigator can be activated via the ProMax Navigator Toolbar.

An asterisk (*), throughout the report, denotes a user specified value.

A question mark (?) after a value, throughout the report, denotes an extrapolated or approximate value.

Charlie Brown – Condensate Tank

"Total Uncontrolled Emissions" Component Sums		
BTEX	0.008503	ton/yr
GHGs	0.01626	ton/yr
HAPs	0.03429	ton/yr
VOCs	0.6973	ton/yr



Process Streams	Flash	Residual	Slug Catcher	Dump Line	Standing	Total Controlled Emissions	Total Uncontrolled Emissions	Working
Composition	Status:	Solved	Solved	Solved	Solved	Unsolved	Solved	Solved
Phase: Total	From Block:	TANK-100	TANK-100	--	TANK-100	--	MIX-100	TANK-100
	To Block:	MIX-100	--	TANK-100	MIX-100	--	--	MIX-100
Mole Fraction		%	%	%	%	%	%	%
H2S		0	0.001003613*	0.045761832		0.045761832	0.045761832	0.045761832
Nitrogen		0	0.00000000*	0.0000000		0.000000	0.000000	0.000000
Carbon Dioxide		0.0000000	0.014051*	0.6407		0.6407	0.6407	0.6407
Methane		0.000000	0.113408*	5.1711		5.1711	5.1711	5.1711
Ethane		0.00000	0.30108*	13.7285		13.7285	13.7285	13.7285
Propane		0.961458	1.607788*	30.43221		30.43221	30.43221	30.43221
Isobutane		0.51001	0.59615*	4.43777		4.43777	4.43777	4.43777
n-Butane		3.86850	4.24829*	21.18596		21.18596	21.18596	21.18596
Isopentane		3.68575	3.75652*	6.91264		6.91264	6.91264	6.91264
n-Pentane		6.469497	6.522481*	8.885409		8.885409	8.885409	8.885409
2,3-Dimethylbutane		0.578843	0.573565*	0.338162		0.338162	0.338162	0.338162
Cyclopentane		0.57549	0.57356*	0.487691		0.487691	0.487691	0.487691
n-Hexane		5.50438	5.42854*	2.046326		2.046326	2.046326	2.046326
Benzene		1.04069	1.02670*	0.402468		0.402468	0.402468	0.402468
Cyclohexane		3.87133	3.80871*	1.015911		1.015911	1.015911	1.015911
2-Methylhexane		1.43518	1.40907*	0.244741		0.244741	0.244741	0.244741
n-Heptane		16.71589	16.39101*	1.902310		1.902310	1.902310	1.902310
Methylcyclohexane		7.768255	7.618426*	0.9365000		0.9365000	0.9365000	0.9365000
2,3,4-Trimethylpentane		0.211068	0.206744*	0.0138977		0.0138977	0.0138977	0.0138977
Toluene		1.950303	1.911883*	0.19846728		0.19846728	0.19846728	0.19846728
n-Octane		22.055075	21.587716*	0.74483278		0.74483278	0.74483278	0.74483278
Ethylbenzene		0.902367	0.883179*	0.02745623		0.02745623	0.02745623	0.02745623
m-Xylene		0.708611	0.693497*	0.01942302		0.01942302	0.01942302	0.01942302
p-Xylene		0.70859	0.69350*	0.020360		0.020360	0.020360	0.020360
o-Xylene		0.50048	0.48976*	0.0120389		0.0120389	0.0120389	0.0120389
n-Nonane		12.6718	12.3966*	0.1268976		0.1268976	0.1268976	0.1268976
n-Decane		7.306475586	7.146728222*	0.0224607		0.0224607	0.0224607	0.0224607
Molar Flow		lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h
H2S		0	0	1.52806E-06*	1.35486E-06	1.52806E-06	1.73197E-07	1.52806E-06
Nitrogen		0.00000000	0	0.00000000*	0.00000E+00	0.00000000	0.00000000	0.00000000
Carbon Dioxide		0.0000000	0.00000000	0.0000214*	0.00001897	0.0000214	0.00000242	0.00000242
Methane		0.0000000	0.0000000	0.0001727*	0.00015310	0.0001727	0.00001957	0.00001957
Ethane		0.0000000	0.000000	0.000458*	0.00040646	0.0004584	0.00005196	0.00005196
Propane		0.00000000	0.0014318	0.0024479*	0.000901000	0.00101618	0.000115178	0.000115178
Isobutane		0.00000000	0.000759	0.000908*	0.000131388	0.00014818	0.00001680	0.00001680
n-Butane		0.00000000	0.005761	0.006468*	0.000627248	0.00070743	0.000080183	0.000080183
Isopentane		0.00000000	0.005489	0.005720*	0.000204661	0.00023082	0.000026163	0.000026163
n-Pentane		0.00000000	0.0096342	0.0099308*	2.63068E-04	0.000296697	3.36290E-05	3.36290E-05
2,3-Dimethylbutane		0.00000000	0.0008620	0.0008733*	1.00119E-05	0.000011292	1.27985E-06	1.27985E-06
Cyclopentane		0.00000000	0.000857	0.000873*	1.44390E-05	0.000016285	1.84579E-06	1.84579E-06
n-Hexane		0.00000000	0.008197	0.008265*	6.05852E-05	0.000068330	7.74482E-06	7.74482E-06
Benzene		0.00000000	0.001550	0.001563*	1.19158E-05	0.00001344	0.000001523	0.000001523
Cyclohexane		0.00000000	0.005765	0.005799*	3.00779E-05	0.000033923	3.84496E-06	3.84496E-06
2-Methylhexane		0.00000000	0.002137	0.002145*	7.24600E-06	0.000008172	9.26282E-07	9.26282E-07
n-Heptane		0.00000E+00	0.024893	0.024956*	5.63213E-05	0.000063521	7.19976E-06	7.19976E-06
Methylcyclohexane		0.00000E+00	0.0115682	0.0115995*	2.77268E-05	3.12712E-05	3.54441E-06	3.54441E-06
2,3,4-Trimethylpentane		0.00000E+00	0.0003143	0.0003148*	4.11466E-07	4.64065E-07	5.25992E-08	5.25992E-08
Toluene		0.00000E+00	0.0029043	0.0029110*	5.87598E-06	6.62713E-06	7.51148E-07	7.51148E-07
n-Octane		0.00000E+00	0.0328437	0.0328685*	2.20521E-05	2.48711E-05	2.81900E-06	2.81900E-06
Ethylbenzene		0.00000E+00	0.0013438	0.0013447*	8.12891E-07	9.16806E-07	1.03915E-07	1.03915E-07
m-Xylene		0.00000E+00	0.0010552	0.0010559*	5.75053E-07	6.48564E-07	7.35111E-08	7.35111E-08
p-Xylene		0.000000000	0.001055	0.001056*	6.02783E-07	0.000000680	7.70560E-08	7.70560E-08
o-Xylene		0.00000E+00	0.000745	0.000746*	3.56434E-07	4.01998E-07	4.55642E-08	4.55642E-08
n-Nonane		0.00000E+00	0.01887	0.01887*	3.75703E-06	4.23731E-06	4.80275E-07	4.80275E-07
n-Decane		0.00000E+00	1.08806E-02	1.08813E-02*	6.64989E-07	7.49997E-07	8.50080E-08	8.50080E-08

Process Streams	Flash	Residual	Slug Catcher	Dump Line	Standing	Total Controlled Emissions	Total Uncontrolled Emissions	Working
Composition	Status:	Solved	Solved	Solved	Solved	Unsolved	Solved	Solved
Phase: Total	From Block:	TANK-100	TANK-100	--	TANK-100	--	MIX-100	TANK-100
	To Block:	MIX-100	--	TANK-100	MIX-100	--	--	MIX-100
Mass Fraction		%	%	%	%		%	%
H2S		0		0.000336623*	0.029464747		0.029464747	0.029464747
Nitrogen		0		0.00000000*	0.000000		0.000000	0.000000
Carbon Dioxide		0.00000000		0.0060857*	0.5327		0.5327	0.5327
Methane		0.000000		0.017905*	1.5673		1.5673	1.5673
Ethane		0.000000		0.089099*	7.7989		7.7989	7.7989
Propane		0.412812		0.697736*	25.35231		25.35231	25.35231
Isobutane		0.28863		0.34101*	4.8730		4.8730	4.8730
n-Butane		2.189329		2.430096*	23.26370		23.26370	23.26370
Isopentane		2.58930		2.66736*	9.42239		9.42239	9.42239
n-Pentane		4.544916		4.631360*	12.111416		12.111416	12.111416
2,3-Dimethylbutane		0.485703		0.486443*	0.550549		0.550549	0.550549
Cyclopentane		0.39299		0.39589*	0.64618		0.64618	0.64618
n-Hexane		4.61868		4.60398*	3.331550		3.331550	3.331550
Benzene		0.79153		0.78927*	0.59393		0.59393	0.59393
Cyclohexane		3.17242		3.15463*	1.61528		1.61528	1.61528
2-Methylhexane		1.40026		1.38956*	0.463310		0.463310	0.463310
n-Heptane		16.30917		16.16399*	3.601190		3.601190	3.601190
Methylcyclohexane		7.426765		7.361763*	1.737185		1.737185	1.737185
2,3,4-Trimethylpentane		0.234760		0.232421*	0.029992		0.029992	0.029992
Toluene		1.749722		1.733679*	0.3454762		0.3454762	0.3454762
n-Octane		24.530672		24.268783*	1.6073921		1.6073921	1.6073921
Ethylbenzene		0.932805		0.922778*	0.0550695		0.0550695	0.0550695
m-Xylene		0.732514		0.724590*	0.0389571		0.0389571	0.0389571
p-Xylene		0.73249		0.72459*	0.040836		0.040836	0.040836
o-Xylene		0.51736		0.51172*	0.024147		0.024147	0.024147
n-Nonane		15.8248		15.6475*	0.307480		0.307480	0.307480
n-Decane		#####		10.007440206*	0.0603755		0.0603755	0.0603755
Mass Flow		lb/h	lb/h	lb/h	lb/h		lb/h	lb/h
H2S		0	0	5.20776E-05*	4.61749E-05		5.20776E-05	5.9027E-06
Nitrogen		0.0000000	0	0.00000000*	0.00000000		0.0000000	0.00000000
Carbon Dioxide		0.000000	0.0000000	0.000941*	0.0008348		0.000941	0.000107
Methane		0.000000	0.00000	0.00277*	0.0024561		0.002770	0.000314
Ethane		0.000000	0.00000	0.01378*	0.0122218		0.013784	0.001562
Propane		0.0000000	0.06313	0.10794*	0.03973017		0.044809	0.0050789
Isobutane		0.000000	0.0441	0.0528*	0.0076366		0.008613	0.0009762
n-Butane		0.0000000	0.33483	0.37595*	0.03645706		0.041117	0.0046604
Isopentane		0.000000	0.3960	0.4127*	0.01476604		0.016654	0.0018876
n-Pentane		0.0000000	0.69509	0.71650*	0.01898007		0.0214064	0.00242629
2,3-Dimethylbutane		0.0000000	0.07428	0.07526*	0.00086278		0.0009731	0.00011029
Cyclopentane		0.0000000	0.0601	0.0612*	0.00101265		0.0011421	0.00012945
n-Hexane		0.0000000	0.70637	0.71226*	0.00522095		0.0058884	0.00066741
Benzene		0.0000000	0.1211	0.1221*	0.00093076		0.0010497	0.0001190
Cyclohexane		0.0000000	0.4852	0.4880*	0.00253134		0.0028549	0.00032359
2-Methylhexane		0.0000000	0.2142	0.2150*	0.00072606		0.0008189	0.00009282
n-Heptane		0.0000000	2.4943	2.5007*	0.005643505		0.0063649	0.00072143
Methylcyclohexane		0.00000000	1.13584	1.13891*	0.002722382		0.00307039	0.000348012
2,3,4-Trimethylpentane		0.00000000	0.03590	0.03596*	0.000047001		0.00005301	0.000006008
Toluene		0.000000000	0.26760	0.26821*	5.41404E-04		0.000610613	0.000069210
n-Octane		0.000000000	3.75168	3.75452*	2.51898E-03		0.002840990	0.000322010
Ethylbenzene		0.000000000	0.14266	0.14276*	8.63006E-05		0.000097333	0.000011032
m-Xylene		0.000000000	0.11203	0.11210*	6.10505E-05		0.000068855	7.80431E-06
p-Xylene		0.0000000	0.1120	0.1121*	0.00006399		0.0000722	0.00000818
o-Xylene		0.00000000	0.0791	0.0792*	0.000037841		0.00004268	0.000004837
n-Nonane		0.0000000	2.420	2.421*	0.000481859		0.0005435	0.00006160
n-Decane		0.000000000	1.54810307	1.54820978*	9.46158E-05		0.000106711	0.000012095

Process Streams		Flash	Residual	Slug Catcher	Dump Line	Standing	Total Controlled Emissions	Total Uncontrolled Emissions	Working
Composition		Status: Solved	Solved	Solved	Solved	Unsolved	Solved	Solved	
Phase: Total	From Block:	TANK-100	TANK-100	--	TANK-100	--	MIX-100	TANK-100	
	To Block:	MIX-100	--	TANK-100	MIX-100	--	--	MIX-100	
Process Streams		Flash	Residual	Slug Catcher	Dump Line	Standing	Total Controlled Emissions	Total Uncontrolled Emissions	Working
Properties		Status: Solved	Solved	Solved	Solved	Unsolved	Solved	Solved	
Phase: Total	From Block:	TANK-100	TANK-100	--	TANK-100	--	MIX-100	TANK-100	
	To Block:	MIX-100	--	TANK-100	MIX-100	--	--	MIX-100	
Property	Units								
Temperature	°F	76.1907	76.1907		100*	76.1907		76.1907	
Pressure	psig	-1.43594878	-1.43594878		2.6900*	-1.43594878		-1.435948776	
Mole Fraction Vapor	%		0		0	96.60111328		96.60111328	
Mole Fraction Light Liquic	%		100		100	3.398886718		3.398886718	
Mole Fraction Heavy Liqui	%		0		0	0		0	
Phase Mole Fraction	%		100		100	100		100	
Molecular Weight	lb/lbmol		102.701		101.609	52.9312		52.9312	
Mass Density	lb/ft^3		43.9945		43.1703	0.1288787		0.1288787	
Molar Flow	lbmol/h	0.0000000	0.14892		0.15226	0.00296068		0.003339	
Mass Flow	lb/h	0.00000	15.294		15.471	0.156712		0.17675	
Vapor Volumetric Flow	ft^3/h	0.0000	0.3476		0.3584	1.21597		1.3714	
Liquid Volumetric Flow	gpm	0.00000	0.04334		0.04468	0.151601		0.17098	
Std Vapor Volumetric Flo	MMSCFD	0.000000000	0.0013563		0.0013867	2.69647E-05		0.00003041	
Std Liquid Volumetric Flo	sgpm	0.0000000	0.04311		0.04375*	0.00056873		0.00006414	
Compressibility			0.00538274		0.0068132	0.947019		0.947019	
Specific Gravity			0.705393		0.692178				
API Gravity			66.9188		67.3475				
Enthalpy	Btu/h		-13594		-13604	-152.725		-172.25	
Mass Enthalpy	Btu/lb		-888.887		-879.349	-974.56		-974.56	
Mass Cp	Btu/(lb*°F		0.504322		0.520305	0.406588		0.406588	
Ideal Gas CpCv Ratio			1.05384		1.05235	1.10467		1.10467	
Dynamic Viscosity	cP		0.465927		0.393874				
Kinematic Viscosity	cSt		0.661148		0.569576				
Thermal Conductivity	Btu/(h*ft**		0.0716038		0.0691394				
Surface Tension	lbf/ft		0.001437637		0.00130478				
Net Ideal Gas Heating Value	Btu/ft^3		5181.33		5127.58	2730.35		2730.35	
Net Liquid Heating Value	Btu/lb		18998.2		19003.1	19421.3		19421.3	
Gross Ideal Gas Heating Value	Btu/ft^3		5577.49		5520.07	2959.59		2959.59	
Gross Liquid Heating Value	Btu/lb		20462.4		20469.3	21065.4		21065.4	

Tank Losses Report TANK-100					
Client Name:		Targa Resources		Job:	
Location:		Charlie Brown		Modified: 7/3/2024 8:34	
Flowsheet:		Flowsheet1		Status: Solved 9:02 AM, 7/3/2024	
Stream Connections					
Stream		Connection Type		Other Block	
Slug Catcher Dump Line		Inlet		Flash	
Working		Working Losses Stream		ashing Losses Stre	
Residual		Residual Liquid Stream		anding Losses Stre	
		MIX-100		MIX-100	
				MIX-100	
Working and Standing Properties : Scalar Data					
Tank Geometry		Vertical Cylinder*		Roof Type	
Shell Length		15* ft		Cone	
Shell Diameter		10* ft		Slope of Coned Roof	
Number of Storage Tanks		1*		Breather Vent Pressure	
Maximum Fraction Fill of Tank		90* %		Breather Vacuum Pressure	
Average Fraction Fill of Tank		50* %		Location	
Minimum Fraction Fill of Tank		10 %		Midland, TX*	
Material Category		Light Organics*		Time Frame	
Insulation		Uninsulated		Known Liquid Bulk Temperature?	
Bolted or Riveted Construction?		FALSE		Liquid Bulk Temperature	
Vapor Balanced Tank?		FALSE		Use AP 42 Raoult's Vapor Pressure?	
Known Sum of Increases in Liquid Level?		FALSE		Flashing Temperature	
Sum of Increases in Liquid Level		39.089 ft/yr		Average Daily Maximum Ambient Temperature	
Shell Color		Beige/Cream*		Average Daily Minimum Ambient Temperature	
Shell Paint Condition		Average		Atmospheric Pressure at Tank Location	
Roof Color		Beige/Cream*		Daily Solar Insolation	
Roof Paint Condition		Average		Average Wind Speed	
				Include Short Term Emissions	
				TRUE	
Composition Subset Properties : Scalar Data					
Component Subset		All Selected*		Species in Results	
Atomic Basis		FALSE		Fraction Denominator	
				Selected Species	
				Selected Species	
Composition Subset Properties : Tabulated Data					
Selected Components					
Index					
H2S					
Nitrogen					
Carbon Dioxide					
Methane					
Ethane					
Propane					
Isobutane					
n-Butane					
Isopentane					
n-Pentane					
2,3-Dimethylbutane					
Cyclopentane					
n-Hexane					
Benzene					
Cyclohexane					
2-Methylhexane					
n-Heptane					
Methylcyclohexane					
2,3,4-Trimethylpentane					
Toluene					
n-Octane					
Ethylbenzene					
m-Xylene					
p-Xylene					
o-Xylene					
n-Nonane					
n-Decane					
Details Properties : Scalar Data					
Vapor Space Volume		597.23 ft^3		Liquid Height	
Vapor Density		0.0685303 lb/ft^3		Roof Outage	
Vapor Space Expansion Factor		0.536942 1/day		Tank Roof Height	
Vented Vapor Saturation Factor		0.205184		Tank Shell Radius	
Vapor Space Outage		7.604166667 ft		Vapor Molecular Weight	
Average Daily Vapor Temperature Range		32.5165 °R		Average Vapor Temperature	
Average Daily Vapor Pressure Range		1.79418 psi		Average Daily Ambient Temperature	
Breather Vent Pressure Setting Range		0.06 psi		Net Working Loss Throughput	
Vapor Pressure at Average Daily Liquid Surface Temperature		9.6116 psia		Working Loss Turnover (Saturation) Factor	
Average Daily Liquid Surface Temperature		527.732 °R		Number of Turnovers per Year	
Average Daily Ambient Temperature Range		25.3 °R		Annual Net Throughput	
Tank Roof Surface Solar Absorptance		0.42		Maximum Liquid Height	
Tank Shell Surface Solar Absorptance		0.42		Minimum Liquid Height	
Vapor Pressure at Maximum Liquid Surface Temperature		10.5484 psia		Working Loss Product Factor	
Vapor Pressure at Minimum Liquid Surface Temperature		8.7543 psia		Vent Setting Correction Factor	
Maximum Liquid Surface Temperature		535.861 °R		Annual Net Throughput Per Tank	
Minimum Liquid Surface Temperature		519.602 °R			

Results Properties : Scalar Data

Flashing Losses	0.0000 ton/yr	Standing Losses per Tank	0.686400 ton/yr
Working Losses	0.08774 ton/yr	Flashing Losses per Tank	0.00000 ton/yr
Standing Losses	0.68640 ton/yr	Working and Standing Losses	0.77414 ton/yr
Working Losses per Tank	0.08774 ton/yr	Working and Standing Losses per Tank	0.77414 ton/yr

Results Properties : Tabulated Data

Index	Flashing Losses Mass Flows ton/yr	Standing Losses Mass Flows ton/yr	Standing Losses Mass Flows ton/yr
H2S	0 2.6E-05	0.000202246	0.0002281
Nitrogen	0.000000 #####	0.00000000	0.0000000
Carbon Dioxide	0.00000 0.000467	0.003656	0.004124
Methane	0.00000 0.001375	0.010758	0.012133
Ethane	0.00000 0.006843	0.053532	0.060375
Propane	0.000000 #####	0.1740181	0.196264
Isobutane	0.00000 0.004276	0.033448	0.037724
n-Butane	0.000000 #####	0.1596819	0.180095
Isopentane	0.000000 #####	0.0646753	0.072943
n-Pentane	0.0000000 #####	0.08313271	0.0937599
2,3-Dimethylbutane	0.0000000 #####	0.00377896	0.0042620
Cyclopentane	0.000000 #####	0.0044354	0.0050024
n-Hexane	0.0000000 #####	0.02286775	0.0257910
Benzene	0.000000 #####	0.0040767	0.0045979
Cyclohexane	0.000000 #####	0.0110873	0.0125046
2-Methylhexane	0.0000000 #####	0.00318016	0.0035867
n-Heptane	0.0000000 #####	0.02471855	0.0278784
Methylcyclohexane	0.0000000 #####	0.01192403	0.01344832
2,3,4-Trimethylpentane	0.0000000 #####	0.00020586	0.00023218
Toluene	0.00000000 #####	0.002371347	0.002674485
n-Octane	0.00000000 #####	0.011033133	0.012443538
Ethylbenzene	0.00000000 #####	0.000377997	0.000426317
m-Xylene	0.00000000 #####	0.000267401	0.000301584
p-Xylene	0.0000000 #####	0.00028030	0.0003161
o-Xylene	0.0000000 #####	0.00016574	0.00018693
n-Nonane	0.00000000 #####	0.00211054	0.0023803
n-Decane	0.00000000 #####	0.000414417	0.000467394

Short Term Properties : Scalar Data

Maximum Battery Filling Rate	42.8571* bbl/hr	Worst-Case Flashing Losses per Tank	0.0000 lb/h
Short-Term Number of Storage Tanks	1	Short-Term Working Losses per Tank	23.3094 lb/h
Worst-Case Liquid Surface Temperature	95 °F	Short-Term Vapor Molecular Weight	44.9248 lb/lbmol
Worst-Case Flashing Losses	0.000 lb/h	Vapor Pressure at Worst-Case Temperature	13.0554 psia
Short-Term Working Losses	23.3094 lb/h		

Short Term Properties : Tabulated Data

Index	Worst-Case Flashing Losses Mass Flows lb/h	Working Losses Mass Flows lb/h
H2S	0	0.00569
Nitrogen	0.00000 0.000000	
Carbon Dioxide	0.0000 0.29569	
Methane	0.0000 1.89947	
Ethane	0.0000 1.9588	
Propane	0.00000 4.63827	
Isobutane	0.0000 0.96023	
n-Butane	0.00000 4.72733	
Isopentane	0.00000 2.06646	
n-Pentane	0.00000 2.735046	
2,3-Dimethylbutane	0.00000 0.131522	
Cyclopentane	0.00000 0.150015	
n-Hexane	0.00000 0.837519	
Benzene	0.00000 0.14665	
Cyclohexane	0.00000 0.409053	
2-Methylhexane	0.00000 0.122450	
n-Heptane	0.000000 0.991418	
Methylcyclohexane	0.000000 #####	
2,3,4-Trimethylpentane	0.000000 #####	
Toluene	0.0000000 #####	
n-Octane	0.0000000 #####	
Ethylbenzene	0.0000000 #####	
m-Xylene	0.0000000 #####	
p-Xylene	0.00000 0.012291	
o-Xylene	0.000000 0.007397	
n-Nonane	0.000000 0.103220	
n-Decane	0.0000000 #####	

Notes:



Bryan Research & Engineering, LLC

ProMax[®] 6.0

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Simulation Report

Project: CharlieBrownPW Tank.pmx

Licensed to Targa Resources, LLC and Affiliates

Client Name: Targa Resources

Location: Charlie Brown

Job:

T:\CorpData\Engineering & Operations\ES&H\Air\Permits\Texas\NSR and PBR Permits\SAOU Area\Charlie Brown CS\2024-06_CharlieBrownCS_NRSPRev_IncreaseThpt(2024-

ProMax Filename: 237)\05_WorkingFiles\ProMax\CharlieBrownPW Tank.pmx

ProMax Version: 6.0.23032.0

Simulation Initiated: 7/3/2024 9:17:53 AM

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Chemical Engineering Consultants

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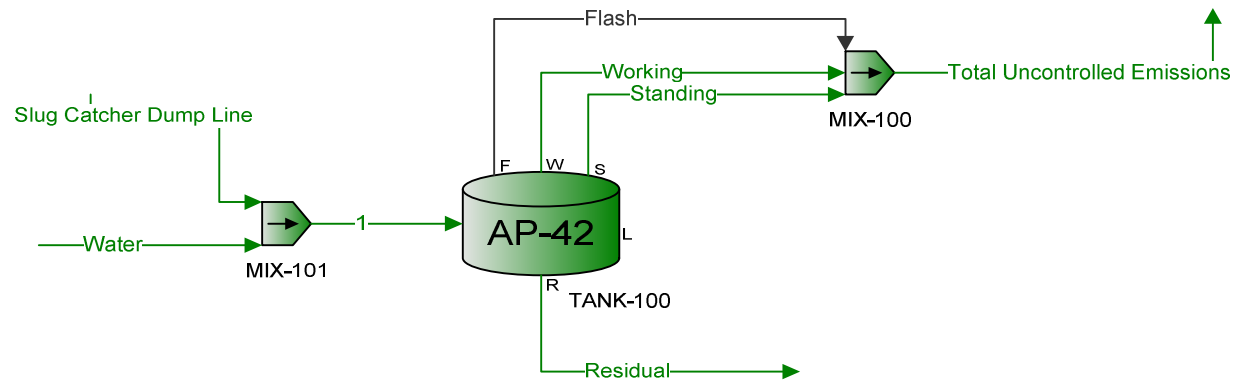
Report Navigator can be activated via the ProMax Navigator Toolbar.

An asterisk (*), throughout the report, denotes a user specified value.

A question mark (?) after a value, throughout the report, denotes an extrapolated or approximate value.

Charlie Brown – Produced Water Tank

"Total Uncontrolled Emissions" Component Sums		
BTEX	0.01462	ton/yr
GHGs	0.003907	ton/yr
HAPs	0.07104	ton/yr
VOCs	1.161	ton/yr



Process Streams	Flash	Residual	Slug Catcher	Dump Line	Standing	Total Uncontrolled Emissions	Water	Working	1
Composition	Status:	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved
Phase: Total	From Block:	TANK-100	TANK-100	--	TANK-100	MIX-100	--	TANK-100	MIX-101
	To Block:	MIX-100	--	MIX-101	MIX-100	--	MIX-101	MIX-100	TANK-100
Mole Fraction		%	%	%	%	%	%	%	%
H2S		8.15766E-07		0.001003613*	0.002791627		0.002791627	0*	0.002791627 1.25628E-06
Nitrogen		0		0.0000000*	0.0000000		0.0000000	0*	0.0000000 0.00000E+00
Carbon Dioxide		0		0.014051*	0.11143		0.11143	0*	0.11143 0.000017588
Methane		0		0.113408*	0.89936		0.89936	0*	0.89936 0.00014196
Ethane		0		0.30108*	2.3877		2.3877	0*	2.3877 0.00037688
Propane		0		1.607788*	12.75024		12.75024	0*	12.75024 0.002012565
Isobutane		0		0.59615*	4.7276		4.7276	0*	4.7276 0.00074623
n-Butane		0.000227577		4.24829*	32.24869		32.24869	0*	32.24869 0.00531784
Isopentane		0.002991345		3.75652*	10.8422		10.8422	0*	10.8422 0.00470227
n-Pentane		0.005947791		6.522481*	14.05002		14.05002	0*	14.05002 0.008164581
2,3-Dimethylbutane		0.000633796		0.573565*	0.53387		0.53387	0*	0.53387 0.000717966
Cyclopentane		0.00059952		0.57356*	0.75098		0.75098	0*	0.75098 0.00071797
n-Hexane		0.00628482		5.42854*	3.23992		3.23992	0*	3.23992 0.00679523
Benzene		0.00121877		1.02670*	0.42196		0.42196	0*	0.42196 0.00128518
Cyclohexane		0.00451657		3.80871*	1.59483		1.59483	0*	1.59483 0.00476759
2-Methylhexane		0.00170296		1.40907*	0.38729		0.38729	0*	0.38729 0.00176382
n-Heptane		0.02004565		16.39101*	3.010026		3.010026	0*	3.010026 0.02051761
Methylcyclohexane		0.009304162		7.618426*	1.480866		1.480866	0*	1.480866 0.009536441
2,3,4-Trimethylpentane		0.000255365		0.206744*	0.021983		0.021983	0*	0.021983 0.00025879
Toluene		0.002348500		1.911883*	0.2856563		0.2856563	0*	0.2856563 0.002393218
n-Octane		0.026841044		21.587716*	1.1773043		1.1773043	0*	1.1773043 0.027022639
Ethylbenzene		0.001099014		0.883179*	0.0423736		0.0423736	0*	0.0423736 0.001105529
m-Xylene		0.000863446		0.693497*	0.0302949		0.0302949	0*	0.0302949 0.000868091
p-Xylene		0.00086323		0.69350*	0.03168		0.03168	0*	0.03168 0.00086809
o-Xylene		0.00061025		0.48976*	0.018440		0.018440	0*	0.018440 0.00061307
n-Nonane		0.0154884		12.3966*	0.200250		0.200250	0*	0.200250 0.0155176
n-Decane		0.0089		7.146728222*	0.0354		0.0354	0*	0.0354 0.0089
Water		99.88921512		0.000000000*	8.71685711		8.71685711	100*	8.71685711 9.98748E+01
Molar Flow		lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h
H2S		0	2.38432E-07		3.67243E-07*	3.98821E-08		1.28812E-07	0* 8.89297E-08 3.67243E-07
Nitrogen		0	0		0.00000E+00*	0.00000E+00		0.00000E+00	0* 0.00000E+00 0.00000E+00
Carbon Dioxide		0	0		5.14141E-06*	1.59186E-06		5.14141E-06	0* 3.54955E-06 5.14141E-06
Methane		0	0		4.14985E-05*	1.28486E-05		4.14985E-05	0* 2.86499E-05 4.14985E-05
Ethane		0	0		0.000110173*	3.41112E-05		1.10173E-04	0* 7.60617E-05 0.000110173
Propane		0	0		5.88324E-04*	1.82154E-04		5.88324E-04	0* 4.06170E-04 5.88324E-04
Isobutane		0	0		0.000218143*	6.75402E-05		2.18143E-04	0* 1.50602E-04 0.000218143
n-Butane		0	6.65161E-05		1.55454E-03*	4.60715E-04		1.48802E-03	0* 1.02731E-03 1.55454E-03
Isopentane		0	0.000874308		0.001374592*	1.54895E-04		5.00283E-04	0* 3.45388E-04 0.001374592
n-Pentane		0	1.73842E-03		2.38671E-03*	2.00723E-04		6.48298E-04	0* 4.47575E-04 2.38671E-03
2,3-Dimethylbutane		0	1.85246E-04		2.09880E-04*	7.62706E-06		2.46340E-05	0* 1.70069E-05 2.09880E-04
Cyclopentane		0	1.75228E-04		0.000209880*	1.07288E-05		3.46519E-05	0* 2.39231E-05 0.000209880
n-Hexane		0	1.83692E-03		1.98642E-03*	4.62865E-05		1.49497E-04	0* 1.03210E-04 1.98642E-03
Benzene		0	3.56220E-04		0.000375690*	6.02825E-06		1.94701E-05	0* 1.34419E-05 0.000375690
Cyclohexane		0	0.001320099		0.001393688*	2.27843E-05		7.35890E-05	0* 5.08047E-05 0.001393688
2-Methylhexane		0	0.000497739		0.000515610*	5.53300E-06		1.78706E-05	0* 1.23376E-05 0.000515610
n-Heptane		0	5.85893E-03		5.99782E-03*	4.30022E-05		1.38889E-04	0* 9.58869E-05 5.99782E-03
Methylcyclohexane		0	2.71941E-03		2.78774E-03*	2.11561E-05		6.83304E-05	0* 4.71742E-05 2.78774E-03
2,3,4-Trimethylpentane		0	7.46378E-05		7.56521E-05*	3.14057E-07		1.01435E-06	0* 7.00290E-07 7.56521E-05
Toluene		0	6.86418E-04		6.99598E-04*	4.08098E-06		1.31808E-05	0* 9.09982E-06 6.99598E-04
n-Octane		0	7.84508E-03		7.89940E-03*	1.68193E-05		5.43234E-05	0* 3.75040E-05 7.89940E-03
Ethylbenzene		0	3.21219E-04		3.23174E-04*	6.05362E-07		1.95521E-06	0* 1.34985E-06 3.23174E-04
m-Xylene		0	2.52367E-04		2.53765E-04*	4.32803E-07		1.39787E-06	0* 9.65070E-07 2.53765E-04
p-Xylene		0	0.000252303		0.000253765*	4.52566E-07		1.46170E-06	0* 1.00914E-06 0.000253765
o-Xylene		0	0.000178364		0.000179215*	2.63440E-07		8.50862E-07	0* 5.87422E-07 0.000179215
n-Nonane		0	0.00452695		0.00453619*	2.86084E-06		9.23997E-06	0* 6.37914E-06 0.00453619
n-Decane		0	0.00261		0.002615139*	0.000000505		0.000001632	0.00000* 1.12656E-06 0.00262
Water		0	29.19554173		0.00000E+00*	1.24532E-04		4.02215E-04	29.195944* 2.77683E-04 2.91959E+01

Process Streams	Flash	Residual	Slug Catcher	Dump Line	Standing	Total Uncontrolled Emissions	Water	Working	1
Composition	Status: Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved
Phase: Total	From Block: TANK-100	TANK-100	--	TANK-100	MIX-100	--	TANK-100	MIX-101	
	To Block: MIX-100	--	MIX-101	MIX-100	--	MIX-101	MIX-100	TANK-100	
Mass Fraction	%	%	%	%	%	%	%	%	%
H2S	1.53489E-06		0.000336623*	0.001587401		0.001587401	0*	0.001587401	2.36288E-06
Nitrogen	0		0.0000000*	0.0000000		0.0000000	0*	0.0000000	0.00000E+00
Carbon Dioxide	0		0.0060857*	0.081818		0.081818	0*	0.081818	0.000042717
Methane	0		0.017905*	0.24073		0.24073	0*	0.24073	0.00012568
Ethane	0		0.089099*	1.19788		1.19788	0*	1.19788	0.00062542
Propane	0		0.697736*	9.38063		9.38063	0*	9.38063	0.00489766
Isobutane	0		0.34101*	4.5846		4.5846	0*	4.5846	0.0023936
n-Butane	0.000730252		2.430096*	31.27322		31.27322	0*	31.27322	0.01705774
Isopentane	0.011915096		2.66736*	13.0517		13.0517	0*	13.0517	0.0187232
n-Pentane	0.02369118		4.631360*	16.91314		16.91314	0*	16.91314	0.03250922
2,3-Dimethylbutane	0.00301533		0.486443*	0.76761		0.76761	0*	0.76761	0.00341453
Cyclopentane	0.00232128		0.39589*	0.87876		0.87876	0*	0.87876	0.0027789
n-Hexane	0.02990046		4.60398*	4.65838		4.65838	0*	4.65838	0.03231701
Benzene	0.0052558		0.78927*	0.5499		0.5499	0*	0.5499	0.0055402
Cyclohexane	0.0209852		3.15463*	2.23942		2.23942	0*	2.23942	0.0221435
2-Methylhexane	0.0094207		1.38956*	0.64749		0.64749	0*	0.64749	0.0097538
n-Heptane	0.1108915		16.16399*	5.03228		5.03228	0*	5.03228	0.1134610
Methylcyclohexane	0.05043466		7.361763*	2.425962		2.425962	0*	2.425962	0.05167493
2,3,4-Trimethylpentane	0.00161041		0.232421*	0.041897		0.041897	0*	0.041897	0.00163145
Toluene	0.01194630		1.733679*	0.4391399		0.4391399	0*	0.4391399	0.01216933
n-Octane	0.16926842		24.268783*	2.2437870		2.2437870	0*	2.2437870	0.17035153
Ethylbenzene	0.00644149		0.922778*	0.0750576		0.0750576	0*	0.0750576	0.00647732
m-Xylene	0.00506079		0.724590*	0.0536623		0.0536623	0*	0.0536623	0.00508617
p-Xylene	0.0050595		0.72459*	0.05611		0.05611	0*	0.05611	0.0050862
o-Xylene	0.0035768		0.51172*	0.032663		0.032663	0*	0.032663	0.0035920
n-Nonane	0.109669		15.6475*	0.42851		0.42851	0*	0.42851	0.109836
n-Decane	0.0702		10.00744021*	0.08395		0.08395	0*	0.08395	0.0702
Water	99.34856543		0.000000000*	2.62010868		2.62010868	100*	2.62010868	9.92981E+01
Mass Flow	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h
H2S	0	8.12596E-06	1.2516E-05*	1.35922E-06		4.39002E-06	0*	3.0308E-06	1.2516E-05
Nitrogen	0	0	0.00000E+00*	0.00000E+00		0.00000E+00	0*	0.00000E+00	0.00000E+00
Carbon Dioxide	0	0	0.000226271*	0.000070057		0.000226271	0*	0.000156214	0.000226271
Methane	0	0	0.00066574*	0.000206123		0.000665738	0*	0.000459615	0.00066574
Ethane	0	0	0.00331280*	0.00102569		0.00331280	0*	0.00228710	0.00331280
Propane	0	0	0.02594250*	0.008032193		0.025942499	0*	0.017910306	0.02594250
Isobutane	0	0	0.01267892*	0.00392559		0.01267892	0*	0.00875333	0.01267892
n-Butane	0	0.00386606	0.09035333*	0.02677778		0.08648727	0*	0.05970949	0.09035333
Isopentane	0	0.063080265	0.09917510*	0.01117551		0.03609484	0*	0.02491933	0.09917510
n-Pentane	0	0.12542456	0.17219850*	0.01448193		0.04677394	0*	0.032292016	0.17219850
2,3-Dimethylbutane	0	0.015963601	0.01808644*	0.00065726		0.00212284	0*	0.001465578	0.01808644
Cyclopentane	0	0.01228922	0.01471946*	0.00075244		0.00243024	0*	0.001677800	0.01471946
n-Hexane	0	0.15829743	0.17118036*	0.003988753		0.012882933	0*	0.008894181	0.17118036
Benzene	0	0.02782498	0.0293458*	0.00047088		0.00152085	0*	0.00104997	0.0293458
Cyclohexane	0	0.1110989	0.1172921*	0.00191751		0.00619321	0*	0.004275697	0.1172921
2-Methylhexane	0	0.0498744	0.0516651*	0.000554417		0.001790666	0*	0.001236248	0.0516651
n-Heptane	0	0.58707595	0.60099291*	0.004308902		0.013916958	0*	0.009608056	0.60099291
Methylcyclohexane	0	0.267008479	0.273717568*	0.002077236		0.006709089	0*	4.63185E-03	0.273717568
2,3,4-Trimethylpentane	0	0.00852576	0.00864163*	0.000035874		0.000115867	0*	7.99931E-05	0.00864163
Toluene	0	0.06324544	0.06445989*	3.76015E-04		1.21446E-03	0*	8.38443E-04	0.06445989
n-Octane	0	0.89613181	0.90233709*	1.92125E-03		6.20528E-03	0*	4.28403E-03	0.90233709
Ethylbenzene	0	0.03410220	0.03430978*	6.42683E-05		2.07575E-04	0*	1.43306E-04	0.03430978
m-Xylene	0	0.02679257	0.02694097*	4.59485E-05		1.48405E-04	0*	1.02457E-04	0.02694097
p-Xylene	0	0.0267858	0.0269410*	0.000048047		0.000155182	0*	0.000107135	0.0269410
o-Xylene	0	0.0189360	0.0190263*	0.000027968		0.000090332	0*	0.000062364	0.0190263
n-Nonane	0	0.580604	0.581789*	0.000366917		0.001185074	0*	0.000818157	0.581789
n-Decane	0	0.3719	0.372086418*	0.00007188		0.00023217	0*	0.00016029	0.372086418
Water	0	525.965859	0.00000E+00*	2.24348E-03		7.24601E-03	525.97311*	5.00254E-03	5.25973E+02

Process Streams		Flash	Residual	Slug Catcher	Dump Line	Standing	Total Uncontrolled Emissions	Water	Working	1
Composition		Status: Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved
Phase: Total		From Block: TANK-100	TANK-100	--	TANK-100	MIX-100	--	TANK-100	MIX-101	
		To Block: MIX-100	--	MIX-101	MIX-100	--	MIX-101	MIX-100	TANK-100	
Process Streams		Flash	Residual	Slug Catcher	Dump Line	Standing	Total Uncontrolled Emissions	Water	Working	1
Properties		Status: Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved
Phase: Total		From Block: TANK-100	TANK-100	--	TANK-100	MIX-100	--	TANK-100	MIX-101	
		To Block: MIX-100	--	MIX-101	MIX-100	--	MIX-101	MIX-100	TANK-100	
Property	Units									
Temperature	°F	#####	76.1907		100*	76.1907	76.1907	100*	76.1907	99.9963
Pressure	psig	#####	-1.43595		2.69*	-1.43595	-1.43595	2.69*	-1.43595	2.69
Mole Fraction Vapor	%		0		0	77.5912	77.5912	0	77.5912	0
Mole Fraction Light Liquid	%		0.1098778		100	16.2962	16.2962	100	16.2962	0.123332
Mole Fraction Heavy Liquid	%		99.8901		0	6.1126	6.1126	0	6.1126	99.8767
Phase Mole Fraction	%		100		100	100	100	100	100	100
Molecular Weight	lb/lbmol		18.1133		101.609	59.9352	59.9352	18.0153	59.9352	18.1199
Mass Density	lb/ft^3		62.0597		43.1703	0.182557	0.182557	61.9507	0.182557	61.7635
Molar Flow	lbmol/h	0	29.22792		0.03659212	0.001428632	0.004614217	29.19594	0.003185585	29.23254
Mass Flow	lb/h	0	529.4146		3.718098	0.0856253	0.2765538	525.973105	0.1909285	529.6912
Vapor Volumetric Flow	ft^3/h	0	8.53073		0.0861264	0.469033	1.514889	8.49019	1.0458560	8.57612
Liquid Volumetric Flow	gpm	0	1.063572		0.01073784	0.0584768	0.1888692	1.058517	0.13039243	1.069231
Std Vapor Volumetric Flow	MMSCFD	0	0.2661967		3.33267E-04	1.30114E-05	4.20245E-05	0.2659055	2.90131E-05	0.2662388
Std Liquid Volumetric Flow	sgpm	0	1.061068		0.01051458*	0.000280138	0.000904794	1.051458*	6.24656E-04	1.061973
Compressibility			0.000673002		0.0068132	0.757026	0.757026	0.00084178	0.757026	0.00084924
Specific Gravity			0.995045		0.692178			0.993297		0.990296
API Gravity			10.3570		67.3475			9.99793		10.3976
Enthalpy	Btu/h		-3591190?		-3269.504?	-91.9407?	-296.9515?	-3575961	-205.0108?	-3579231
Mass Enthalpy	Btu/lb		-6783.32?		-879.349?	-1073.76?	-1073.76?	-6798.75	-1073.76?	-6757.20
Mass Cp	Btu/(lb*°F)		0.975057214		0.520304606	0.437692536	0.437692536	0.977081	0.437692536	0.973907
Ideal Gas CpCv Ratio			1.32710		1.05235	1.09188	1.09188	1.32816	1.09188	1.32601
Dynamic Viscosity	cP		0.917984		0.393874			0.700611		0.697568
Kinematic Viscosity	cSt		0.923431		0.569576			0.706009		0.705072
Thermal Conductivity	Btu/(h*ft^2*°F)		0.347409		0.0691394			0.360083		0.357137
Surface Tension	lbf/ft		0.00495411		0.00130478?			0.00480959		0.00477463?
Net Ideal Gas Heating Value	Btu/ft^3		5.94598		5127.58	2999.48	2999.48	0	2999.48	6.41849
Net Liquid Heating Value	Btu/lb		-929.237		19003.1	18812.8	18812.8	-1059.76	18812.8	-918.930
Gross Ideal Gas Heating Value	Btu/ft^3		56.6529		5520.07	3249.11	3249.11	50.3100	3249.11	57.1568
Gross Liquid Heating Value	Btu/lb		133.103		20469.3	20393.9	20393.9	0	20393.9	143.682

Tank Losses Report
TANK-100

Client Name:

Targa Resources

Job:

Location:

Charlie Brown

Modified:

7/3/2024 9:16

Flowsheet:

Flowsheet1

Status:

Solved 9:16 AM, 7/3/2024

StreamConnections

Stream	Connection Type	Other Block	Stream	Connection Type	Other Block
1	Inlet	MIX-101	Flash	Flashing Losses Stream	MIX-100
Working	Working Losses Stream	MIX-100	Standing	Standing Losses Stream	MIX-100
Residual	Residual Liquid Stream				

Working and Standing Properties : Scalar Data

Tank Geometry	Vertical Cylinder*	Roof Type	Cone
Shell Length	15* ft	Slope of Coned Roof	0.0625*
Shell Diameter	10* ft	Breather Vent Pressure	0.03* psig
Number of Storage Tanks	1*	Breather Vacuum Pressure	-0.03* psig
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	66.18948 °F
Insulation	Uninsulated	Use AP 42 Raoult's Vapor Pressure?	FALSE
Bolted or Riveted Construction?	FALSE	Flashing Temperature	76.19065769 °F
Vapor Balanced Tank?	FALSE	Average Daily Maximum Ambient Tempera	76.7000 °F
Known Sum of Increases in Liquid Level?	FALSE	Average Daily Minimum Ambient Temperat	51.4 °F
Sum of Increases in Liquid Level	950.9373 ft/yr	Atmospheric Pressure at Tank Location	13.26 psia
Shell Color	Beige/Cream*	Daily Solar Insolation	1698 Btu/(day*ft^2)
Shell Paint Condition	Average	Average Wind Speed	11 mph
Roof Color	Beige/Cream*	Include Short Term Emissions	TRUE
Roof Paint Condition	Average		

Composition Subset Properties : Scalar Data

Component Subset	All Selected*	Species in Results	Selected Species
Atomic Basis	FALSE	Fraction Denominator	Selected Species

Composition Subset Properties : Tabulated Data

Index	Selected Components
H2S	TRUE
Nitrogen	TRUE
Carbon Dioxide	TRUE
Methane	TRUE
Ethane	TRUE
Propane	TRUE
Isobutane	TRUE
n-Butane	TRUE
Isopentane	TRUE
n-Pentane	TRUE
2,3-Dimethylbutane	TRUE
Cyclopentane	TRUE
n-Hexane	TRUE
Benzene	TRUE
Cyclohexane	TRUE
2-Methylhexane	TRUE
n-Heptane	TRUE
Methylcyclohexane	TRUE
2,3,4-Trimethylpentane	TRUE
Toluene	TRUE
n-Octane	TRUE
Ethylbenzene	TRUE
m-Xylene	TRUE
p-Xylene	TRUE
o-Xylene	TRUE
n-Nonane	TRUE
n-Decane	TRUE
Water	TRUE

Details Properties : Scalar Data

Vapor Space Volume	597.23 ft^3	Liquid Height	7.5 ft
Vapor Density	0.0552188 lb/ft^3	Roof Outage	0.104166667 ft
Vapor Space Expansion Factor	0.295556 1/day	Tank Roof Height	0.3125 ft
Vented Vapor Saturation Factor	0.283457	Tank Shell Radius	5 ft
Vapor Space Outage	7.604166667 ft	Vapor Molecular Weight	50.0350 lb/lbmol
Average Daily Vapor Temperature Range	32.5165 °R	Average Vapor Temperature	529.604 °R
Average Daily Vapor Pressure Range	1.69470 psi	Average Daily Ambient Temperature	523.72 °R
Breather Vent Pressure Setting Range	0.06 psi	Net Working Loss Throughput	74686.4 ft^3/yr
Vapor Pressure at Average Daily Liquid Surface Temperature	6.27231 psia	Working Loss Turnover (Saturation) Factor	0.545240513
Average Daily Liquid Surface Temperature	527.732 °R	Number of Turnovers per Year	79.24478
Average Daily Ambient Temperature Range	25.3 °R	Annual Net Throughput	13303.61 bbl/yr
Tank Roof Surface Solar Absorptance	0.42	Maximum Liquid Height	13.5 ft
Tank Shell Surface Solar Absorptance	0.42	Minimum Liquid Height	1.5 ft
Vapor Pressure at Maximum Liquid Surface Temperature	7.1689 psia	Working Loss Product Factor	1
Vapor Pressure at Minimum Liquid Surface Temperature	5.47422 psia	Vent Setting Correction Factor	1.000000
Maximum Liquid Surface Temperature	535.861 °R	Annual Net Throughput Per Tank	13303.61 bbl/yr
Minimum Liquid Surface Temperature	519.602 °R		

Results Properties : Scalar Data

Flashing Losses	0 ton/yr	Standing Losses per Tank	0.375039 ton/yr
Working Losses	0.8362670 ton/yr	Flashing Losses per Tank	0 ton/yr
Standing Losses	0.375039 ton/yr	Working and Standing Losses	1.211306 ton/yr
Working Losses per Tank	0.8362670 ton/yr	Working and Standing Losses per Tank	1.211306 ton/yr

Results Properties : Tabulated Data

Index	Flashing Losses Mass	Working Losses	Working and Standing	
	Flows ton/yr	Mass Flows ton/yr	Standing Losses Mass Flows ton/yr	Losses Mass Flows ton/yr
H2S	0	1.32749E-05	5.95337E-06	1.92283E-05
Nitrogen	0	0.00000E+00	0.000000000	0.000000000
Carbon Dioxide	0	0.000684217	0.00030685	0.00099107
Methane	0	0.00201311	0.00090282	0.00291593
Ethane	0	0.01001751	0.0044925	0.0145100
Propane	0	0.07844714	0.03518101	0.11362815
Isobutane	0	0.0383396	0.0171941	0.0555337
n-Butane	0	0.26152758	0.1172867	0.3788142
Isopentane	0	0.1091467	0.0489487	0.1580954
n-Pentane	0	0.14143903	0.06343083	0.20486986
2,3-Dimethylbutane	0	0.00641923	0.00287882	0.00929805
Cyclopentane	0	0.00734876	0.00329568	0.0106444
n-Hexane	0	0.03895651	0.01747074	0.05642725
Benzene	0	0.00459887	0.0020624	0.0066613
Cyclohexane	0	0.01872755	0.00839870	0.0271263
2-Methylhexane	0	0.00541477	0.00242835	0.00784312
n-Heptane	0	0.04208328	0.01887299	0.06095628
Methylcyclohexane	0	0.020287515	0.009098295	0.029385810
2,3,4-Trimethylpentane	0	0.000350370	0.000157129	0.00050750
Toluene	0	3.67238E-03	0.001646945	0.005319327
n-Octane	0	1.87640E-02	0.008415070	0.027179119
Ethylbenzene	0	6.27682E-04	0.000281495	0.000909177
m-Xylene	0	4.48760E-04	2.01254E-04	0.000650014
p-Xylene	0	0.00046925	0.00021044	0.00067970
o-Xylene	0	0.000273153	0.000122500	0.00039565
n-Nonane	0	0.00358353	0.00160710	0.00519062
n-Decane	0	0.00070207	0.00031485	0.0010169
Water	0	2.19111E-02	9.82642E-03	3.17375E-02

Short Term Properties : Scalar Data

Maximum Battery Filling Rate	107.14286* bbl/hr	Worst-Case Flashing Losses per Tank	0 lb/h
Short-Term Number of Storage Tanks	1	Short-Term Working Losses per Tank	32.814293 lb/h
Worst-Case Liquid Surface Temperature	95 °F	Short-Term Vapor Molecular Weight	51.9820 lb/lbmol
Worst-Case Flashing Losses	0 lb/h	Vapor Pressure at Worst-Case Temperatu	9.6836 psia
Short-Term Working Losses	32.814293 lb/h		

Short Term Properties : Tabulated Data

Index	Worst-Case Flashing	Short-Term Working
	Losses Mass Flows lb/h	Losses Mass Flows lb/h
H2S	0	0.000505111
Nitrogen	0	0.000000000
Carbon Dioxide	0	0.01597998
Methane	0	0.0470166
Ethane	0	0.2339605
Propane	0	1.8321441
Isobutane	0	0.895427
n-Butane	0	6.3810476
Isopentane	0	5.1417221
n-Pentane	0	6.8592839
2,3-Dimethylbutane	0	0.3297111
Cyclopentane	0	0.3658333
n-Hexane	0	2.1056042
Benzene	0	0.2384238
Cyclohexane	0	1.0180782
2-Methylhexane	0	0.3077298
n-Heptane	0	2.49151288
Methylcyclohexane	0	1.17949364
2,3,4-Trimethylpentane	0	0.02124808
Toluene	0	0.212284743
n-Octane	0	1.223425758
Ethylbenzene	0	0.040558816
m-Xylene	0	0.029111934
p-Xylene	0	0.0302043
o-Xylene	0	0.01785937
n-Nonane	0	0.2587594
n-Decane	0	0.0555935
Water	0	1.48177E+00

Notes:



Bryan Research & Engineering, LLC

ProMax[®] 6.0

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Simulation Report

Project: CharlieBrownMethanolTank.pmx

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Client Name: Targa
Location: Charlie Brown Compressor Station
Job:

T:\CorpData\Engineering & Operations\ES&H\Air\Permits\Texas\NSR and PBR Permits\SAOU Area\Charlie Brown CS\2024-06_CharlieBrownCS_NRSPRev_IncreaseThpt(2024-
ProMax Filename: 237)\05_WorkingFiles\ProMax\CharlieBrownMethanolTank.pmx
ProMax Version: 6.0.23032.0
Simulation Initiated: 7/24/2024 4:46:31 PM

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<http://www.bre.com/>

Report Navigator can be activated via the ProMax Navigator Toolbar.

An asterisk (*), throughout the report, denotes a user specified value.

A question mark (?) after a value, throughout the report, denotes an extrapolated or approximate value.

Targa Midstream Services LLC

Charlie Brown CS

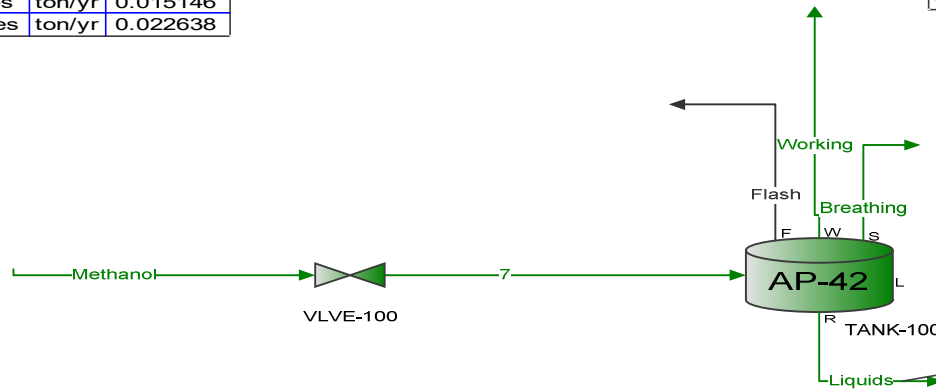
Methanol Working/Breathing/Flash Losses

Annual Emissions

Names	Units	TANK-100
Working Losses	ton/yr	0.015146
Standing Losses	ton/yr	0.022638

Hourly Emissions

Names	Units	TANK-100
Short-Term Working Losses	lb/h	6.0043



Properties	Liquids
Std Liquid Volumetric Flow (Total)	1.56 bbl/d

Names	Units	Methanol	Breathing	Flash	Working	7	Liquids
Temperature	°F	52*	73.464	73.464	73.464	52.072	73.464
Pressure	psia	29.196*	13.26	13.26	13.26	14.696*	13.26
Std Vapor Volumetric Flow	MMSCFD	0.0051677	1.4691e-06	0	9.8292e-07	0.0051677	0.0051653
Std Liquid Volumetric Flow	bbl/d	1.5656*	0.00044505	0	0.00029777	1.5656	1.5648
Gross Ideal Gas Heating Value	Btu/ft^3	866.7	866.7		866.7	866.7	866.7
Net Ideal Gas Heating Value	Btu/ft^3	766.1	766.1		766.1	766.1	766.1

Process Streams		Breathing	Flash	Liquids	Methanol	Working	7
Composition		Status:	Solved	Solved	Solved	Solved	Solved
Phase: Total	From Block:	TANK-100	TANK-100	TANK-100	--	TANK-100	VLVE-100
	To Block:	--	--	--	VLVE-100	--	TANK-100
Mole Fraction		%		%	%	%	%
MeOH		100		100	100*	100	100
Molar Flow		lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h
MeOH		0.000161301	0	0.567139	0.567408*	0.000107923	0.567408
Mass Fraction		%		%	%	%	%
MeOH		100		100	100*	100	100
Mass Flow		lb/h	lb/h	lb/h	lb/h	lb/h	lb/h
MeOH		0.00516840	0	18.1722	18.1808*	0.00345804	18.1808

Process Streams		Breathing	Flash	Liquids	Methanol	Working	7
Properties		Status:	Solved	Solved	Solved	Solved	Solved
Phase: Total	From Block:	TANK-100	TANK-100	TANK-100	--	TANK-100	VLVE-100
	To Block:	--	--	--	VLVE-100	--	TANK-100
Property	Units						
Temperature	°F	73.4642	73.4642	73.4642	52*	73.4642	52.0716
Pressure	psia	13.26	13.26	13.26	29.1959*	13.26	14.6959*
Mole Fraction Vapor	%	0		0	0	0	0
Mole Fraction Light Liquid	%	100		100	100	100	100
Mole Fraction Heavy Liquid	%	0		0	0	0	0
Phase Mole Fraction	%	100		100	100	100	100
Molecular Weight	lb/lbmol	32.0419		32.0419	32.0419	32.0419	32.0419
Mass Density	lb/ft^3	50.3071		50.3071	51.1794	50.3071	51.1747
Molar Flow	lbmol/h	0.000161301	0	0.567139	0.567408	0.000107923	0.567408
Mass Flow	lb/h	0.00516840	0	18.1722	18.1808	0.00345804	18.1808
Vapor Volumetric Flow	ft^3/h	0.000102737	0	0.361226	0.355237	6.87387E-05	0.355269
Liquid Volumetric Flow	gpm	1.28088E-05	0	0.0450359	0.0442893	8.57002E-06	0.0442933
Std Vapor Volumetric Flow	MMSCFD	1.46907E-06	0	0.00516529	0.00516774	9.82918E-07	0.00516774
Std Liquid Volumetric Flow	sgpm	1.29807E-05	0	0.0456404	0.0456621*	8.68506E-06	0.0456621
Compressibility		0.00147616		0.00147616	0.00332883	0.00147616	0.00167550
Specific Gravity		0.806607		0.806607	0.820593	0.806607	0.820519
API Gravity		42.0370		42.0370	42.0304	42.0370	42.0364
Enthalpy	Btu/h	-16.6511		-58545.6	-58824.5	-11.1408	-58824.5
Mass Enthalpy	Btu/lb	-3221.71		-3221.71	-3235.52	-3221.71	-3235.52
Mass Cp	Btu/(lb*°F)	0.649932		0.649932	0.642047	0.649932	0.642136
Ideal Gas CpCv Ratio		1.23329		1.23329	1.23829	1.23329	1.23828
Dynamic Viscosity	cP	0.560510		0.560510	0.666453	0.560510	0.665752
Kinematic Viscosity	cSt	0.695559		0.695559	0.812931	0.695559	0.812150
Thermal Conductivity	Btu/(h*ft*°F)	0.115830		0.115830	0.117767	0.115830	0.117760
Surface Tension	lbf/ft	0.00154059		0.00154059	0.00162107	0.00154059	0.00162080
Net Ideal Gas Heating Value	Btu/ft^3	766.100		766.100	766.100	766.100	766.100
Net Liquid Heating Value	Btu/lb	8557		8557	8557	8557	8557
Gross Ideal Gas Heating Value	Btu/ft^3	866.700		866.700	866.700	866.700	866.700
Gross Liquid Heating Value	Btu/lb	9749		9749	9749	9749	9749

Process Streams		Breathing	Flash	Liquids	Methanol	Working	7
Composition		Status:	Solved	Solved	Solved	Solved	Solved
Phase: Aqueous Liquid	From Block:	TANK-100	TANK-100	TANK-100	--	TANK-100	VLVE-100
	To Block:	--	--	--	VLVE-100	--	TANK-100
Mole Fraction		%		%	%	%	%
MeOH		100		100	100	100	100
Molar Flow		lbmol/h		lbmol/h	lbmol/h	lbmol/h	lbmol/h
MeOH		0.000161301		0.567139	0.567408	0.000107923	0.567408
Mass Fraction		%		%	%	%	%
MeOH		100		100	100	100	100
Mass Flow		lb/h		lb/h	lb/h	lb/h	lb/h
MeOH		0.00516840		18.1722	18.1808	0.00345804	18.1808

Process Streams		Breathing	Flash	Liquids	Methanol	Working	7
Properties		Status:	Solved	Solved	Solved	Solved	Solved
Phase: Aqueous Liquid	From Block:	TANK-100	TANK-100	TANK-100	--	TANK-100	VLVE-100
	To Block:	--	--	--	VLVE-100	--	TANK-100
Property	Units						
Temperature	°F	73.4642		73.4642	52	73.4642	52.0716
Pressure	psia	13.26		13.26	29.1959	13.26	14.6959
Mole Fraction Vapor	%	0		0	0	0	0
Mole Fraction Light Liquid	%	100		100	100	100	100
Mole Fraction Heavy Liquid	%	0		0	0	0	0
Phase Mole Fraction	%	100		100	100	100	100
Molecular Weight	lb/lbmol	32.0419		32.0419	32.0419	32.0419	32.0419
Mass Density	lb/ft^3	50.3071		50.3071	51.1794	50.3071	51.1747
Molar Flow	lbmol/h	0.000161301		0.567139	0.567408	0.000107923	0.567408
Mass Flow	lb/h	0.00516840		18.1722	18.1808	0.00345804	18.1808
Vapor Volumetric Flow	ft^3/h	0.000102737		0.361226	0.355237	6.87387E-05	0.355269
Liquid Volumetric Flow	gpm	1.28088E-05		0.0450359	0.0442893	8.57002E-06	0.0442933
Std Vapor Volumetric Flow	MMSCFD	1.46907E-06		0.00516529	0.00516774	9.82918E-07	0.00516774
Std Liquid Volumetric Flow	sgpm	1.29807E-05		0.0456404	0.0456621	8.68506E-06	0.0456621
Compressibility		0.00147616		0.00147616	0.00332883	0.00147616	0.00167550
Specific Gravity		0.806607		0.806607	0.820593	0.806607	0.820519
API Gravity		42.0370		42.0370	42.0304	42.0370	42.0364
Enthalpy	Btu/h	-16.6511		-58545.6	-58824.5	-11.1408	-58824.5
Mass Enthalpy	Btu/lb	-3221.71		-3221.71	-3235.52	-3221.71	-3235.52
Mass Cp	Btu/(lb*°F)	0.649932		0.649932	0.642047	0.649932	0.642136
Ideal Gas CpCv Ratio		1.23329		1.23329	1.23829	1.23329	1.23828
Dynamic Viscosity	cP	0.560510		0.560510	0.666453	0.560510	0.665752
Kinematic Viscosity	cSt	0.695559		0.695559	0.812931	0.695559	0.812150
Thermal Conductivity	Btu/(h*ft*°F)	0.115830		0.115830	0.117767	0.115830	0.117760
Surface Tension	lbf/ft	0.00154059		0.00154059	0.00162107	0.00154059	0.00162080
Net Ideal Gas Heating Value	Btu/ft^3	766.100		766.100	766.100	766.100	766.100
Net Liquid Heating Value	Btu/lb	8557		8557	8557	8557	8557
Gross Ideal Gas Heating Value	Btu/ft^3	866.700		866.700	866.700	866.700	866.700
Gross Liquid Heating Value	Btu/lb	9749		9749	9749	9749	9749

Tank Losses Report
TANK-100

Client Name:	Targa	Job:	
Location:	Charlie Brown Compressor Station	Modified:	7/24/2024 16:45
Flowsheet:	MeOH	Status:	Solved 4:46 PM, 7/24/

Stream Connections

Stream	Connection Type	Other Block	Stream	Connection Type	Other Block
7	Inlet	VLVE-100	Flash	Flashing Losses Stream	
Working	Working Losses Stream		Breathing	Standing Losses Stream	
Liquids	Residual Liquid Stream				

Working and Standing Properties : Scalar Data

Tank Geometry	Horizontal Cylinder*	Shell Paint Condition	Average
Shell Length	12" ft	Breather Vent Pressure	0.0300000 psig
Shell Diameter	5" ft	Breather Vacuum Pressure	-0.0300000 psig
Number of Storage Tanks	1	Location	Midland, TX*
Maximum Fraction Fill of Tank	90 %	Time Frame	Year
Average Fraction Fill of Tank	50 %	Known Liquid Bulk Temperature?	FALSE
Minimum Fraction Fill of Tank	10 %	Liquid Bulk Temperature	65.3235 °F
Material Category	Light Organics*	Use AP 42 Raoult's Vapor Pressure?	FALSE
Insulation	Uninsulated	Flashing Temperature	73.4642 °F
Underground Tank?	FALSE	Average Daily Maximum Ambient Temperature	76.7 °F
Bolted or Riveted Construction?	FALSE	Average Daily Minimum Ambient Temperature	51.4 °F
Vapor Balanced Tank?	FALSE	Atmospheric Pressure at Tank Location	13.26 psia
Known Sum of Increases in Liquid Level?	FALSE	Daily Solar Insolation	1698 Btu/(day*ft^2)
Sum of Increases in Liquid Level	160.287 ft/yr	Average Wind Speed	11 mph
Shell Color	White	Include Short Term Emissions	TRUE

Composition Subset Properties : Scalar Data

Component Subset	VOCs*	Species in Results	Selected Species
Atomic Basis	FALSE	Fraction Denominator	Selected Species

Composition Subset Properties : Tabulated Data

Selected Components	
Index	
MeOH	TRUE

Details Properties : Scalar Data

Vapor Space Volume	117.810 ft^3	Minimum Liquid Surface Temperature	518.807 °R
Vapor Density	0.0105155 lb/ft^3	Effective Height	3.92699 ft
Vapor Space Expansion Factor	0.119466 1/day	Liquid Height	2.5 ft
Vented Vapor Saturation Factor	0.838131	Roof Outage	0 ft
Effective Shell Diameter	8.74039 ft	Vapor Molecular Weight	32.0419 lb/lbmol
Vapor Space Outage	1.96350 ft	Average Vapor Temperature	526.948 °R
Average Daily Vapor Temperature Range	28.6535 °R	Average Daily Ambient Temperature	523.72 °R
Average Daily Vapor Pressure Range	0.801135 psi	Net Working Loss Throughput	3147.24 ft^3/yr
Breather Vent Pressure Setting Range	0.0600000 psi	Working Loss Turnover (Saturation) Factor	0.915322
Vapor Pressure at Average Daily Liquid Surface Temperature	1.85586 psia	Number of Turnovers per Year	40.0718
Average Daily Liquid Surface Temperature	525.971 °R	Annual Net Throughput	560.605 bbl/yr
Average Daily Ambient Temperature Range	25.3 °R	Maximum Liquid Height	4.5 ft
Tank Roof Surface Solar Absorptance	0.25	Minimum Liquid Height	0.5 ft
Tank Shell Surface Solar Absorptance	0.25	Working Loss Product Factor	1
Vapor Pressure at Maximum Liquid Surface Temperature	2.29310 psia	Vent Setting Correction Factor	1
Vapor Pressure at Minimum Liquid Surface Temperature	1.49196 psia	Annual Net Throughput Per Tank	560.605 bbl/yr
Maximum Liquid Surface Temperature	533.134 °R		

Results Properties : Scalar Data

Flashing Losses	0 ton/yr	Standing Losses per Tank	0.0226376 ton/yr
Working Losses	0.0151462 ton/yr	Flashing Losses per Tank	0 ton/yr
Standing Losses	0.0226376 ton/yr	Working and Standing Losses	0.0377838 ton/yr
Working Losses per Tank	0.0151462 ton/yr	Working and Standing Losses per Tank	0.0377838 ton/yr

Results Properties : Tabulated Data

Index	Flashing Losses Mass Flows ton/yr	Working Losses Mass Flows ton/yr	Standing Losses Mass Flows ton/yr	Working and Standing Losses Mass Flows ton/yr
MeOH	0	0.0151462	0.0226376	0.0377838

Short Term Properties : Scalar Data

Maximum Battery Filling Rate	47.6190* bbl/hr	Worst-Case Flashing Losses per Tank	0 lb/h
Short-Term Number of Storage Tanks	1	Short-Term Working Losses per Tank	6.00433 lb/h
Worst-Case Liquid Surface Temperature	95 °F	Short-Term Vapor Molecular Weight	32.0419 lb/lbmol
Worst-Case Flashing Losses	0 lb/h	Vapor Pressure at Worst-Case Temperature	4.17203 psia
Short-Term Working Losses	6.00433 lb/h		

Short Term Properties : Tabulated Data

Index	Worst-Case Flashing Losses Mass Flows lb/h	Short-Term Working Losses Mass Flows lb/h
MeOH	0	6.00433

Notes:

ProMax Dehydration Emissions Report

Case Name: Charlie Brown 22 MMSCFD

File Name: C:\Users\ls1559\OneDrive - Targa Resources\Desktop\ProMax_Dehydration_Tool.pmx

Date:

Description:

Dry Gas Flow Rate	21.81 MMSCFD
Dry Gas Water Content	2.66 lb/MMSCF
Glycol Circulation Rate	4.30 sgpm
Glycol Circulation Ratio	4.81 gal/lb
Annual Operating Hours	8760 hrs

INPUT SUMMARY:

Feed Stream Specifications

Fraction of Water Saturaton (%)	100.00
Water Content (lbm/MMSCF)	58.86
Temperature (°F)	100.00
Pressure (psig)	950.00
Flow Rate (MMSCFD)	21.99

Lean Glycol Specifications

Glycol Circulation Ratio (gal/lb)	4.30
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Regenerator Specifications

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

Flash Tank Specifications

Is Flash Tank Present?	Flash Tank Present
Temperature (°F)	80.00
Pressure (psig)	40.00
Flash Gas	To Flare

Stripping Gas Specifications

Nitrogen (scfm)	Not In Use
Dry gas (scfm)	Not In Use

Kimray Pump Specifications

Type	Gas Injection
Gas Injection Volume Ratio (acfm/gpm)	0.080

Methanol Specifications

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

BTEx Condenser Specifications

Temperature (°F)	80.00
Pressure (psig)	-0.30
BTEx Emissions	To Flare

General Specifications

Atmospheric Pressure (psia)	14.400
Flash Gas Flare Destruction Efficiency (%)	100.000
Regenerator Flare Destruction Efficiency (%)	98.000

Feed Composition Data (mol %)

Carbon Dioxide	0.86
Hydrogen Sulfide	0.00
Nitrogen	1.81
Methane	76.50
Ethane	10.53
Propane	6.58
i-Butane	0.48
n-Butane	1.80
i-Pentane	0.34
n-Pentane	0.40
Cyclopentane	0.04
n-Hexane	0.11
Cyclohexane	0.04
n-Heptane	0.40
Methylcyclohexane	0.05
2,2,4-Trimethylpentane	0.03
Benzene	0.01
Toluene	0.01
Ethylbenzene	0.00
o-Xylene	0.00
m-Xylene	0.00
p-Xylene	0.00
Triethylene Glycol	0.00
Ethylene Glycol	0.00
Water	0.00
Methanol	0.00
O2	0.00
SO2	0.00
Total	100.00

EMISSIONS REPORTS:

CONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Carbon Dioxide	14.35	344.40	62.85
Hydrogen Sulfide	0.00	0.00	0.00
Nitrogen	150.46	3611.10	659.03
Methane	0.01	0.20	0.04
Ethane	0.01	0.27	0.05
Propane	0.02	0.57	0.10
i-Butane	0.00	0.07	0.01
n-Butane	0.02	0.41	0.08
i-Pentane	0.00	0.11	0.02
n-Pentane	0.01	0.14	0.03
Cyclopentane	0.00	0.07	0.01
n-Hexane	0.00	0.03	0.01
Cyclohexane	0.00	0.05	0.01
n-Heptane	0.00	0.10	0.02
Methylcyclohexane	0.00	0.03	0.01
2,2,4-Trimethylpentane	0.00	0.01	0.00
Benzene	0.01	0.14	0.03
Toluene	0.00	0.04	0.01
Ethylbenzene	0.00	0.00	0.00
o-Xylene	0.00	0.00	0.00
m-Xylene	0.00	0.00	0.00
p-Xylene	0.00	0.00	0.00
Triethylene Glycol	0.00	0.00	0.00
Ethylene Glycol	0.00	0.00	0.00
Water	7.30	175.20	31.97
Methanol	0.00	0.00	0.00
O2	29.10	698.48	127.47
SO2	0.01	0.15	0.03
Total Emissions	201.32	4831.61	881.77
Total HC Emissions	0.09	2.26	0.41
Total VOC Emissions	0.07	1.79	0.33
Total HAP Emissions	0.01	0.24	0.04
Total GHG Emissions	14.36	344.61	62.89

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Carbon Dioxide	0.38	9.10	1.66
Hydrogen Sulfide	0.00	0.09	0.02
Nitrogen	0.00	0.08	0.01
Methane	0.42	10.19	1.86
Ethane	0.59	14.11	2.57
Propane	1.33	31.97	5.83
i-Butane	0.19	4.57	0.83
n-Butane	1.26	30.23	5.52
i-Pentane	0.50	12.08	2.20
n-Pentane	0.79	18.89	3.45
Cyclopentane	0.63	15.05	2.75
n-Hexane	0.47	11.33	2.07
Cyclohexane	0.96	23.06	4.21
n-Heptane	4.13	99.02	18.07
Methylcyclohexane	1.21	28.96	5.29
2,2,4-Trimethylpentane	0.32	7.67	1.40
Benzene	2.73	65.50	11.95
Toluene	2.66	63.85	11.65
Ethylbenzene	0.68	16.32	2.98
o-Xylene	0.43	10.42	1.90
m-Xylene	0.34	8.21	1.50
p-Xylene	0.32	7.77	1.42
Triethylene Glycol	0.01	0.28	0.05
Ethylene Glycol	0.00	0.00	0.00
Water	51.17	1228.00	224.11
Methanol	0.00	0.00	0.00
O2	0.00	0.00	0.00
SO2	0.00	0.00	0.00
Total Emissions	71.53	1716.75	313.31
Total HC Emissions	19.98	479.48	87.51
Total VOC Emissions	18.97	455.18	83.07
Total HAP Emissions	7.96	191.07	34.87
Total GHG Emissions	0.80	19.30	3.52

CONTROLLED FLASH TANK EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Carbon Dioxide	341.56	8197.44	1496.03
Hydrogen Sulfide	0.00	0.00	0.00
Nitrogen	4005.54	96132.99	17544.27
Methane	0.00	0.00	0.00
Ethane	0.00	0.00	0.00
Propane	0.00	0.00	0.00
i-Butane	0.00	0.00	0.00
n-Butane	0.00	0.00	0.00
i-Pentane	0.00	0.00	0.00
n-Pentane	0.00	0.00	0.00
Cyclopentane	0.00	0.00	0.00
n-Hexane	0.00	0.00	0.00
Cyclohexane	0.00	0.00	0.00
n-Heptane	0.00	0.00	0.00
Methylcyclohexane	0.00	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00	0.00
Benzene	0.00	0.00	0.00
Toluene	0.00	0.00	0.00
Ethylbenzene	0.00	0.00	0.00
o-Xylene	0.00	0.00	0.00
m-Xylene	0.00	0.00	0.00
p-Xylene	0.00	0.00	0.00
Triethylene Glycol	0.00	0.00	0.00
Ethylene Glycol	0.00	0.00	0.00
Water	230.43	5530.31	1009.28
Methanol	0.00	0.00	0.00
O2	765.35	18368.28	3352.21
SO2	0.01	0.32	0.06
Total Emissions	5342.89	128229.34	23401.86
Total HC Emissions	0.00	0.00	0.00
Total VOC Emissions	0.00	0.00	0.00
Total HAP Emissions	0.00	0.00	0.00
Total GHG Emissions	341.56	8197.44	1496.03

UNCONTROLLED FLASH TANK OFF GAS

Component	lbs/hr	lbs/day	tons/yr
Carbon Dioxide	3.70	88.91	16.23
Hydrogen Sulfide	0.01	0.17	0.03
Nitrogen	2.30	55.13	10.06
Methane	60.76	1458.13	266.11
Ethane	18.79	450.96	82.30
Propane	19.36	464.65	84.80
i-Butane	1.90	45.57	8.32
n-Butane	7.98	191.54	34.96
i-Pentane	1.86	44.73	8.16
n-Pentane	2.34	56.10	10.24
Cyclopentane	0.39	9.34	1.70
n-Hexane	0.74	17.65	3.22
Cyclohexane	0.39	9.40	1.71
n-Heptane	2.65	63.70	11.63
Methylcyclohexane	0.37	8.78	1.60
2,2,4-Trimethylpentane	0.21	5.03	0.92
Benzene	0.15	3.61	0.66
Toluene	0.07	1.67	0.30
Ethylbenzene	0.01	0.24	0.04
o-Xylene	0.00	0.10	0.02
m-Xylene	0.00	0.11	0.02
p-Xylene	0.00	0.12	0.02
Triethylene Glycol	0.00	0.00	0.00
Ethylene Glycol	0.00	0.00	0.00
Water	0.11	2.69	0.49
Methanol	0.00	0.00	0.00
O2	0.00	0.00	0.00
SO2	0.00	0.00	0.00
Total Emissions	124.10	2978.33	543.55
Total HC Emissions	117.98	2831.44	516.74
Total VOC Emissions	38.43	922.34	168.33
Total HAP Emissions	1.19	28.53	5.21
Total GHG Emissions	64.46	1547.04	282.33

COMBINED REGENERATOR VENT/FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Carbon Dioxide	355.91	8541.85	1558.89
Hydrogen Sulfide	0.00	0.00	0.00
Nitrogen	4156.00	99744.09	18203.30
Methane	0.01	0.20	0.04
Ethane	0.01	0.27	0.05
Propane	0.02	0.57	0.10
i-Butane	0.00	0.07	0.01
n-Butane	0.02	0.41	0.08
i-Pentane	0.00	0.11	0.02
n-Pentane	0.01	0.14	0.03
Cyclopentane	0.00	0.07	0.01
n-Hexane	0.00	0.03	0.01
Cyclohexane	0.00	0.05	0.01
n-Heptane	0.00	0.10	0.02
Methylcyclohexane	0.00	0.03	0.01
2,2,4-Trimethylpentane	0.00	0.01	0.00
Benzene	0.01	0.14	0.03
Toluene	0.00	0.04	0.01
Ethylbenzene	0.00	0.00	0.00
o-Xylene	0.00	0.00	0.00
m-Xylene	0.00	0.00	0.00
p-Xylene	0.00	0.00	0.00
Triethylene Glycol	0.00	0.00	0.00
Ethylene Glycol	0.00	0.00	0.00
Water	237.73	5705.51	1041.26
Methanol	0.00	0.00	0.00
O2	794.45	19066.76	3479.68
SO2	0.02	0.47	0.09
Total Emissions	5544.21	133060.95	24283.62
Total HC Emissions	0.09	2.26	0.41
Total VOC Emissions	0.07	1.79	0.33
Total HAP Emissions	0.01	0.24	0.04
Total GHG Emissions	355.92	8542.05	1558.92

EQUIPMENT REPORTS:

BTX CONDENSER

Condenser Outlet Temperature: 80.00 deg. F
 Condenser Pressure: 14.10 psia
 Condenser Duty: -0.06 MMBTU/hr
 Hydrocarbon Recovery: 1.37 bbls/day
 Produced Water: 3.50 bbls/day
 VOC Control Efficiency: 80.33 %
 HAP Control Efficiency: 93.75 %
 BTEX Control Efficiency: 94.35 %
 Dissolved Hydrocarbons in Water: 540.65 mg/L

Component	Emitted (wt. %)	Condensed (wt. %)
Carbon Dioxide	97.21	2.79
Hydrogen Sulfide	91.29	8.71
Nitrogen	99.83	0.17
Methane	99.40	0.60
Ethane	96.38	3.62
Propane	89.02	10.98
i-Butane	77.15	22.85
n-Butane	68.34	31.66
i-Pentane	44.16	55.84
n-Pentane	36.69	63.31
Cyclopentane	24.79	75.21
n-Hexane	15.01	84.99
Cyclohexane	10.63	89.37
n-Heptane	5.15	94.85
Methylcyclohexane	5.02	94.98
2,2,4-Trimethylpentane	5.70	94.30
Benzene	10.72	89.28
Toluene	3.52	96.48
Ethylbenzene	1.05	98.95
o-Xylene	1.00	99.00
m-Xylene	1.05	98.95
p-Xylene	1.09	98.91
Triethylene Glycol	0.00	100.00
Ethylene Glycol	0.00	0.00
Water	0.15	99.85
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00

ABSORBER

Absorber Stages: 3.00
 Dry Gas Dew Point: 2.66 lb H2O/MMSCF
 Temperature: 110.00 deg. F
 Pressure: 969.40 psia
 Dry Gas Flow Rate: 21.81 MMSCFD
 TEG Losses with Dry Gas: 0.20 lb/hr
 Wet Gas Water Content: 58.86 lb H2O/MMSCF
 Lean Glycol Recirc. Ratio: 4.81 gal/lb H2O

Component	In Dry Gas (%)	Absorbed in Glycol (%)
Carbon Dioxide	99.73	0.27
Hydrogen Sulfide	98.85	1.15
Nitrogen	99.99	0.01
Methane	99.97	0.03
Ethane	99.93	0.07
Propane	99.88	0.12
i-Butane	99.87	0.13
n-Butane	99.80	0.20
i-Pentane	99.76	0.24
n-Pentane	99.70	0.30
Cyclopentane	98.55	1.45
n-Hexane	99.56	0.44
Cyclohexane	98.41	1.59
n-Heptane	99.28	0.72
Methylcyclohexane	98.35	1.65
2,2,4-Trimethylpentane	99.31	0.69
Benzene	88.51	11.49
Toluene	82.04	17.96
Ethylbenzene	77.43	22.57
o-Xylene	68.65	31.35
m-Xylene	76.51	23.49
p-Xylene	78.02	21.98
Triethylene Glycol	0.01	99.99
Ethylene Glycol	-	-
Water	3.24	96.76
Methanol	-	-
O2	-	-
SO2	-	-

FLASH TANK

Flash Temperature: 80 deg. F

Flash Pressure: 40 psig

Component	Flashed (wt. %)	Left in Glycol (wt. %)
Carbon Dioxide	90.71	9.29
Hydrogen Sulfide	65.36	34.64
Nitrogen	99.86	0.14
Methane	99.31	0.69
Ethane	96.97	3.03
Propane	93.56	6.44
i-Butane	90.88	9.12
n-Butane	86.37	13.63
i-Pentane	78.74	21.26
n-Pentane	74.81	25.19
Cyclopentane	38.29	61.71
n-Hexane	60.91	39.09
Cyclohexane	28.95	71.05
n-Heptane	39.15	60.85
Methylcyclohexane	23.25	76.75
2,2,4-Trimethylpentane	39.63	60.37
Benzene	5.21	94.79
Toluene	2.52	97.48
Ethylbenzene	1.37	98.63
o-Xylene	0.92	99.08
m-Xylene	1.32	98.68
p-Xylene	1.45	98.55
Triethylene Glycol	0.00	100.00
Ethylene Glycol	0.00	0.00
Water	0.15	99.85
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00

REGENERATOR

Component	Recovered in Glycol (%)	Distilled Overhead (%)
Carbon Dioxide	0.00	100.00
Hydrogen Sulfide	0.00	100.00
Nitrogen	0.00	100.00
Methane	0.00	100.00
Ethane	0.00	100.00
Propane	0.00	100.00
i-Butane	0.00	100.00
n-Butane	0.00	100.00
i-Pentane	0.00	100.00
n-Pentane	0.00	100.00
Cyclopentane	0.00	100.00
n-Hexane	0.00	100.00
Cyclohexane	0.01	99.99
n-Heptane	0.00	100.00
Methylcyclohexane	0.01	99.99
2,2,4-Trimethylpentane	0.00	100.00
Benzene	0.24	99.76
Toluene	1.02	98.98
Ethylbenzene	3.52	96.48
o-Xylene	7.07	92.93
m-Xylene	3.70	96.30
p-Xylene	3.32	96.68
Triethylene Glycol	100.00	0.00
Ethylene Glycol	-	-
Water	29.19	70.81
Methanol	-	-
O2	-	-
SO2	-	-

STREAM REPORTS:**WET GAS STREAM**

Temperature: 100.00 deg F
Pressure: 964.40 psia
Flow Rate: 21.85 MMSCFD

Component	Conc. (mol%)	Mass Flow (lb/h)
Carbon Dioxide	0.87	913.88
Hydrogen Sulfide	0.00	0.82
Nitrogen	1.81	1218.58
Methane	76.65	29503.30
Ethane	10.51	7585.39
Propane	6.53	6910.66
i-Butane	0.48	664.77
n-Butane	1.76	2451.57
i-Pentane	0.32	561.76
n-Pentane	0.38	650.62
Cyclopentane	0.04	62.28
n-Hexane	0.09	193.29
Cyclohexane	0.04	76.34
n-Heptane	0.31	749.78
Methylcyclohexane	0.04	85.68
2,2,4-Trimethylpentane	0.02	60.67
Benzene	0.01	24.71
Toluene	0.01	15.17
Ethylbenzene	0.00	3.12
o-Xylene	0.00	1.46
m-Xylene	0.00	1.51
p-Xylene	0.00	1.52
Triethylene Glycol	0.00	0.00
Ethylene Glycol	0.00	0.00
Water	0.12	53.61
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	51790.47

DRY GAS STREAM

Temperature: 101.77 deg F
Pressure: 959.40 psia
Flow Rate: 21.81 MMSCFD

Component	Conc. (mol%)	Mass Flow (lb/h)
Carbon Dioxide	0.86	911.46
Hydrogen Sulfide	0.00	0.81
Nitrogen	1.82	1218.49
Methane	76.76	29495.75
Ethane	10.52	7579.80
Propane	6.54	6902.53
i-Butane	0.48	663.88
n-Butane	1.76	2446.79
i-Pentane	0.32	560.42
n-Pentane	0.38	648.68
Cyclopentane	0.04	61.38
n-Hexane	0.09	192.43
Cyclohexane	0.04	75.12
n-Heptane	0.31	744.36
Methylcyclohexane	0.04	84.26
2,2,4-Trimethylpentane	0.02	60.25
Benzene	0.01	21.88
Toluene	0.01	12.47
Ethylbenzene	0.00	2.43
o-Xylene	0.00	1.03
m-Xylene	0.00	1.16
p-Xylene	0.00	1.20
Triethylene Glycol	0.00	0.20
Ethylene Glycol	0.00	0.00
Water	0.01	2.42
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	51689.21

LEAN GLYCOL STREAM

Temperature: 110.00 deg F
Pressure: 969.40 psia
Flow Rate: 4.30 sgpm

Component	Conc. (wt%)	Mass Flow (lb/h)
Carbon Dioxide	0.00	0.00
Hydrogen Sulfide	0.00	0.00
Nitrogen	0.00	0.00
Methane	0.00	0.00
Ethane	0.00	0.00
Propane	0.00	0.00
i-Butane	0.00	0.00
n-Butane	0.00	0.00
i-Pentane	0.00	0.00
n-Pentane	0.00	0.00
Cyclopentane	0.00	0.00
n-Hexane	0.00	0.00
Cyclohexane	0.00	0.00
n-Heptane	0.00	0.00
Methylcyclohexane	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00
Benzene	0.00	0.01
Toluene	0.00	0.03
Ethylbenzene	0.00	0.03
o-Xylene	0.00	0.03
m-Xylene	0.00	0.01
p-Xylene	0.00	0.01
Triethylene Glycol	99.13	2405.78
Ethylene Glycol	0.00	0.00
Water	0.87	21.09
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	2426.99

RICH GLYCOL STREAM

Temperature: 101.54 deg F
Pressure: 964.40 psia
Flow Rate: 5.12 sgpm

Component	Conc. (wt%)	Mass Flow (lb/h)
Carbon Dioxide	0.16	4.08
Hydrogen Sulfide	0.00	0.01
Nitrogen	0.09	2.30
Methane	2.33	61.18
Ethane	0.74	19.38
Propane	0.79	20.69
i-Butane	0.08	2.09
n-Butane	0.35	9.24
i-Pentane	0.09	2.37
n-Pentane	0.12	3.12
Cyclopentane	0.04	1.02
n-Hexane	0.05	1.21
Cyclohexane	0.05	1.35
n-Heptane	0.26	6.78
Methylcyclohexane	0.06	1.57
2,2,4-Trimethylpentane	0.02	0.53
Benzene	0.11	2.89
Toluene	0.11	2.76
Ethylbenzene	0.03	0.71
o-Xylene	0.02	0.47
m-Xylene	0.01	0.36
p-Xylene	0.01	0.34
Triethylene Glycol	91.73	2405.58
Ethylene Glycol	0.00	0.00
Water	2.76	72.37
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	2622.41

FLASH TANK OFF GAS STREAM

Temperature: 80.00 deg F
Pressure: 54.40 psia
Flow Rate: 2013.40 scfh
btu value: 1215.86 btu/scf

Component	Conc. (mol%)	Mass Flow (lb/h)
Carbon Dioxide	1.59	3.70
Hydrogen Sulfide	0.00	0.01
Nitrogen	1.55	2.30
Methane	71.38	60.76
Ethane	11.78	18.79
Propane	8.28	19.36
i-Butane	0.62	1.90
n-Butane	2.59	7.98
i-Pentane	0.49	1.86
n-Pentane	0.61	2.34
Cyclopentane	0.10	0.39
n-Hexane	0.16	0.74
Cyclohexane	0.09	0.39
n-Heptane	0.50	2.65
Methylcyclohexane	0.07	0.37
2,2,4-Trimethylpentane	0.03	0.21
Benzene	0.04	0.15
Toluene	0.01	0.07
Ethylbenzene	0.00	0.01
o-Xylene	0.00	0.00
m-Xylene	0.00	0.00
p-Xylene	0.00	0.00
Triethylene Glycol	0.00	0.00
Ethylene Glycol	0.00	0.00
Water	0.12	0.11
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	124.10

FLASH TANK GLYCOL STREAM

Temperature: 80.00 deg F
Pressure: 54.40 psia
Flow Rate: 4.46 sgpm

Component	Conc. (wt%)	Mass Flow (lb/h)
Carbon Dioxide	0.02	0.38
Hydrogen Sulfide	0.00	0.00
Nitrogen	0.00	0.00
Methane	0.02	0.42
Ethane	0.02	0.59
Propane	0.05	1.33
i-Butane	0.01	0.19
n-Butane	0.05	1.26
i-Pentane	0.02	0.50
n-Pentane	0.03	0.79
Cyclopentane	0.03	0.63
n-Hexane	0.02	0.47
Cyclohexane	0.04	0.96
n-Heptane	0.17	4.13
Methylcyclohexane	0.05	1.21
2,2,4-Trimethylpentane	0.01	0.32
Benzene	0.11	2.74
Toluene	0.11	2.69
Ethylbenzene	0.03	0.70
o-Xylene	0.02	0.47
m-Xylene	0.01	0.36
p-Xylene	0.01	0.34
Triethylene Glycol	96.29	2405.58
Ethylene Glycol	0.00	0.00
Water	2.89	72.26
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	2498.31

REGENERATOR OVERHEADS STREAM

Temperature: 207.20 deg F
Pressure: 14.10 psia
Flow Rate: 1188.11 scfh
btu value: 315.61 btu/scf

Component	Conc. (mol%)	Mass Flow (lb/h)
Carbon Dioxide	0.28	0.38
Hydrogen Sulfide	0.00	0.00
Nitrogen	0.00	0.00
Methane	0.85	0.42
Ethane	0.62	0.59
Propane	0.96	1.33
i-Butane	0.10	0.19
n-Butane	0.69	1.26
i-Pentane	0.22	0.50
n-Pentane	0.35	0.79
Cyclopentane	0.29	0.63
n-Hexane	0.17	0.47
Cyclohexane	0.36	0.96
n-Heptane	1.32	4.13
Methylcyclohexane	0.39	1.21
2,2,4-Trimethylpentane	0.09	0.32
Benzene	1.12	2.73
Toluene	0.92	2.66
Ethylbenzene	0.20	0.68
o-Xylene	0.13	0.43
m-Xylene	0.10	0.34
p-Xylene	0.10	0.32
Triethylene Glycol	0.00	0.01
Ethylene Glycol	0.00	0.00
Water	90.72	51.17
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	71.53

BTEX CONDENSER VENT GAS STREAM

Temperature: 80.00 deg F
Pressure: 14.10 psia
Flow Rate: 46.12 scfh

Component	Conc. (mol%)	Mass Flow (lb/h)
Carbon Dioxide	6.89	0.37
Hydrogen Sulfide	0.08	0.00
Nitrogen	0.10	0.00
Methane	21.65	0.42
Ethane	15.50	0.57
Propane	22.13	1.19
i-Butane	2.08	0.15
n-Butane	12.19	0.86
i-Pentane	2.53	0.22
n-Pentane	3.29	0.29
Cyclopentane	1.82	0.16
n-Hexane	0.68	0.07
Cyclohexane	1.00	0.10
n-Heptane	1.74	0.21
Methylcyclohexane	0.51	0.06
2,2,4-Trimethylpentane	0.13	0.02
Benzene	3.08	0.29
Toluene	0.84	0.09
Ethylbenzene	0.06	0.01
o-Xylene	0.03	0.00
m-Xylene	0.03	0.00
p-Xylene	0.03	0.00
Triethylene Glycol	0.00	0.00
Ethylene Glycol	0.00	0.00
Water	3.60	0.08
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	5.17

BTEX CONDENSER RECOVERED OIL STREAM

Temperature: 80.00 deg F
Pressure: 14.10 psia
Flow Rate: 0.04 sgpm

Component	Conc. (mol%)	Mass Flow (lb/h)
Carbon Dioxide	0.09	0.01
Hydrogen Sulfide	0.00	0.00
Nitrogen	0.00	0.00
Methane	0.08	0.00
Ethane	0.40	0.02
Propane	1.91	0.15
i-Butane	0.43	0.04
n-Butane	3.96	0.40
i-Pentane	2.25	0.28
n-Pentane	3.99	0.50
Cyclopentane	3.88	0.47
n-Hexane	2.69	0.40
Cyclohexane	5.89	0.86
n-Heptane	22.55	3.91
Methylcyclohexane	6.74	1.15
2,2,4-Trimethylpentane	1.52	0.30
Benzene	17.87	2.42
Toluene	16.06	2.56
Ethylbenzene	3.66	0.67
o-Xylene	2.34	0.43
m-Xylene	1.84	0.34
p-Xylene	1.74	0.32
Triethylene Glycol	0.00	0.00
Ethylene Glycol	0.00	0.00
Water	0.11	0.00
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	15.23

BTEX CONDENSER PRODUCED WATER STREAM

Temperature: 80.00 deg F
Pressure: 14.10 psia
Flow Rate: 0.10 sgpm

Component	Conc. (mol%)	Mass Flow (lb/h)
Carbon Dioxide	0.00	0.00
Hydrogen Sulfide	0.00	0.00
Nitrogen	0.00	0.00
Methane	0.00	0.00
Ethane	0.00	0.00
Propane	0.00	0.00
i-Butane	0.00	0.00
n-Butane	0.00	0.00
i-Pentane	0.00	0.00
n-Pentane	0.00	0.00
Cyclopentane	0.00	0.00
n-Hexane	0.00	0.00
Cyclohexane	0.00	0.00
n-Heptane	0.00	0.00
Methylcyclohexane	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00
Benzene	0.01	0.02
Toluene	0.00	0.00
Ethylbenzene	0.00	0.00
o-Xylene	0.00	0.00
m-Xylene	0.00	0.00
p-Xylene	0.00	0.00
Triethylene Glycol	0.00	0.01
Ethylene Glycol	0.00	0.00
Water	99.98	51.08
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	51.13

ProMax Dehydration Emissions Report

Case Name: Charlie Brown 2.5 MMSCFD

File Name: C:\Users\ls1559\OneDrive - Targa Resources\Desktop\ProMax_Dehydration_Tool.pmx

Date:

Description:

Dry Gas Flow Rate	2.43 MMSCFD
Dry Gas Water Content	2.83 lb/MMSCF
Glycol Circulation Rate	4.30 sgpm
Glycol Circulation Ratio	42.97 gal/lb
Annual Operating Hours	8760 hrs

INPUT SUMMARY:

Feed Stream Specifications

Fraction of Water Saturaton (%)	100.00
Water Content (lbm/MMSCF)	58.86
Temperature (°F)	100.00
Pressure (psig)	950.00
Flow Rate (MMSCFD)	2.50

Lean Glycol Specifications

Glycol Circulation Rate (sgpm)	4.30
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Regenerator Specifications

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

Flash Tank Specifications

Is Flash Tank Present?	Flash Tank Present
Temperature (°F)	80.00
Pressure (psig)	40.00
Flash Gas	To Flare

Stripping Gas Specifications

Nitrogen (scfm)	Not In Use
Dry gas (scfm)	Not In Use

Kimray Pump Specifications

Type	Gas Injection
Gas Injection Volume Ratio (acfm/gpm)	0.080

Methanol Specifications

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

BTEx Condenser Specifications

Temperature (°F)	80.00
Pressure (psig)	-0.30
BTEx Emissions	To Flare

General Specifications

Atmospheric Pressure (psia)	14.400
Flash Gas Flare Destruction Efficiency (%)	100.000
Regenerator Flare Destruction Efficiency (%)	98.000

Feed Composition Data (mol %)

Carbon Dioxide	0.86
Hydrogen Sulfide	0.00
Nitrogen	1.81
Methane	76.50
Ethane	10.53
Propane	6.58
i-Butane	0.48
n-Butane	1.80
i-Pentane	0.34
n-Pentane	0.40
Cyclopentane	0.04
n-Hexane	0.11
Cyclohexane	0.04
n-Heptane	0.40
Methylcyclohexane	0.05
2,2,4-Trimethylpentane	0.03
Benzene	0.01
Toluene	0.01
Ethylbenzene	0.00
o-Xylene	0.00
m-Xylene	0.00
p-Xylene	0.00
Triethylene Glycol	0.00
Ethylene Glycol	0.00
Water	0.00
Methanol	0.00
O2	0.00
SO2	0.00
Total	100.00

EMISSIONS REPORTS:

CONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Carbon Dioxide	14.67	352.00	64.24
Hydrogen Sulfide	0.00	0.00	0.00
Nitrogen	154.12	3698.80	675.03
Methane	0.01	0.19	0.03
Ethane	0.01	0.26	0.05
Propane	0.02	0.56	0.10
i-Butane	0.00	0.07	0.01
n-Butane	0.02	0.43	0.08
i-Pentane	0.00	0.12	0.02
n-Pentane	0.01	0.16	0.03
Cyclopentane	0.00	0.09	0.02
n-Hexane	0.00	0.04	0.01
Cyclohexane	0.00	0.06	0.01
n-Heptane	0.01	0.13	0.02
Methylcyclohexane	0.00	0.04	0.01
2,2,4-Trimethylpentane	0.00	0.01	0.00
Benzene	0.01	0.13	0.02
Toluene	0.00	0.03	0.01
Ethylbenzene	0.00	0.00	0.00
o-Xylene	0.00	0.00	0.00
m-Xylene	0.00	0.00	0.00
p-Xylene	0.00	0.00	0.00
Triethylene Glycol	0.00	0.00	0.00
Ethylene Glycol	0.00	0.00	0.00
Water	7.47	179.35	32.73
Methanol	0.00	0.00	0.00
O2	29.81	715.45	130.57
SO2	0.01	0.15	0.03
Total Emissions	206.17	4948.07	903.02
Total HC Emissions	0.10	2.32	0.42
Total VOC Emissions	0.08	1.87	0.34
Total HAP Emissions	0.01	0.22	0.04
Total GHG Emissions	14.67	352.19	64.28

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Carbon Dioxide	0.35	8.37	1.53
Hydrogen Sulfide	0.00	0.08	0.02
Nitrogen	0.00	0.07	0.01
Methane	0.40	9.61	1.75
Ethane	0.56	13.50	2.46
Propane	1.30	31.15	5.68
i-Butane	0.19	4.50	0.82
n-Butane	1.24	29.86	5.45
i-Pentane	0.50	12.11	2.21
n-Pentane	0.81	19.45	3.55
Cyclopentane	0.63	15.20	2.77
n-Hexane	0.49	11.84	2.16
Cyclohexane	0.97	23.27	4.25
n-Heptane	4.35	104.44	19.06
Methylcyclohexane	1.23	29.56	5.40
2,2,4-Trimethylpentane	0.33	8.00	1.46
Benzene	1.94	46.66	8.51
Toluene	1.35	32.49	5.93
Ethylbenzene	0.26	6.32	1.15
o-Xylene	0.12	2.98	0.54
m-Xylene	0.13	3.09	0.56
p-Xylene	0.13	3.09	0.56
Triethylene Glycol	0.00	0.02	0.00
Ethylene Glycol	0.00	0.00	0.00
Water	5.77	138.54	25.28
Methanol	0.00	0.00	0.00
O2	0.00	0.00	0.00
SO2	0.00	0.00	0.00
Total Emissions	23.09	554.20	101.14
Total HC Emissions	16.96	407.14	74.30
Total VOC Emissions	16.00	384.03	70.09
Total HAP Emissions	4.77	114.46	20.89
Total GHG Emissions	0.75	17.98	3.28

CONTROLLED FLASH TANK EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Carbon Dioxide	339.85	8156.32	1488.53
Hydrogen Sulfide	0.00	0.00	0.00
Nitrogen	3988.07	95713.70	17467.75
Methane	0.00	0.00	0.00
Ethane	0.00	0.00	0.00
Propane	0.00	0.00	0.00
i-Butane	0.00	0.00	0.00
n-Butane	0.00	0.00	0.00
i-Pentane	0.00	0.00	0.00
n-Pentane	0.00	0.00	0.00
Cyclopentane	0.00	0.00	0.00
n-Hexane	0.00	0.00	0.00
Cyclohexane	0.00	0.00	0.00
n-Heptane	0.00	0.00	0.00
Methylcyclohexane	0.00	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00	0.00
Benzene	0.00	0.00	0.00
Toluene	0.00	0.00	0.00
Ethylbenzene	0.00	0.00	0.00
o-Xylene	0.00	0.00	0.00
m-Xylene	0.00	0.00	0.00
p-Xylene	0.00	0.00	0.00
Triethylene Glycol	0.00	0.00	0.00
Ethylene Glycol	0.00	0.00	0.00
Water	229.46	5507.14	1005.05
Methanol	0.00	0.00	0.00
O2	762.00	18288.09	3337.58
SO2	0.01	0.31	0.06
Total Emissions	5319.40	127665.57	23298.97
Total HC Emissions	0.00	0.00	0.00
Total VOC Emissions	0.00	0.00	0.00
Total HAP Emissions	0.00	0.00	0.00
Total GHG Emissions	339.85	8156.32	1488.53

UNCONTROLLED FLASH TANK OFF GAS

Component	lbs/hr	lbs/day	tons/yr
Carbon Dioxide	3.60	86.34	15.76
Hydrogen Sulfide	0.01	0.17	0.03
Nitrogen	2.30	55.28	10.09
Methane	60.63	1455.15	265.56
Ethane	18.66	447.75	81.71
Propane	19.24	461.70	84.26
i-Butane	1.89	45.39	8.28
n-Butane	7.93	190.42	34.75
i-Pentane	1.86	44.61	8.14
n-Pentane	2.34	56.19	10.26
Cyclopentane	0.39	9.27	1.69
n-Hexane	0.74	17.71	3.23
Cyclohexane	0.39	9.29	1.70
n-Heptane	2.64	63.37	11.57
Methylcyclohexane	0.36	8.66	1.58
2,2,4-Trimethylpentane	0.21	5.02	0.92
Benzene	0.11	2.68	0.49
Toluene	0.04	0.98	0.18
Ethylbenzene	0.01	0.13	0.02
o-Xylene	0.00	0.05	0.01
m-Xylene	0.00	0.06	0.01
p-Xylene	0.00	0.07	0.01
Triethylene Glycol	0.00	0.00	0.00
Ethylene Glycol	0.00	0.00	0.00
Water	0.04	1.07	0.19
Methanol	0.00	0.00	0.00
O2	0.00	0.00	0.00
SO2	0.00	0.00	0.00
Total Emissions	123.39	2961.35	540.45
Total HC Emissions	117.44	2818.50	514.38
Total VOC Emissions	38.15	915.61	167.10
Total HAP Emissions	1.11	26.70	4.87
Total GHG Emissions	64.23	1541.48	281.32

COMBINED REGENERATOR VENT/FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Carbon Dioxide	354.51	8508.32	1552.77
Hydrogen Sulfide	0.00	0.00	0.00
Nitrogen	4142.19	99412.51	18142.78
Methane	0.01	0.19	0.03
Ethane	0.01	0.26	0.05
Propane	0.02	0.56	0.10
i-Butane	0.00	0.07	0.01
n-Butane	0.02	0.43	0.08
i-Pentane	0.00	0.12	0.02
n-Pentane	0.01	0.16	0.03
Cyclopentane	0.00	0.09	0.02
n-Hexane	0.00	0.04	0.01
Cyclohexane	0.00	0.06	0.01
n-Heptane	0.01	0.13	0.02
Methylcyclohexane	0.00	0.04	0.01
2,2,4-Trimethylpentane	0.00	0.01	0.00
Benzene	0.01	0.13	0.02
Toluene	0.00	0.03	0.01
Ethylbenzene	0.00	0.00	0.00
o-Xylene	0.00	0.00	0.00
m-Xylene	0.00	0.00	0.00
p-Xylene	0.00	0.00	0.00
Triethylene Glycol	0.00	0.00	0.00
Ethylene Glycol	0.00	0.00	0.00
Water	236.94	5686.50	1037.79
Methanol	0.00	0.00	0.00
O2	791.81	19003.54	3468.15
SO2	0.02	0.46	0.08
Total Emissions	5525.57	132613.65	24201.99
Total HC Emissions	0.10	2.32	0.42
Total VOC Emissions	0.08	1.87	0.34
Total HAP Emissions	0.01	0.22	0.04
Total GHG Emissions	354.52	8508.51	1552.80

EQUIPMENT REPORTS:

BTX CONDENSER

Condenser Outlet Temperature: 80.00 deg. F
 Condenser Pressure: 14.10 psia
 Condenser Duty: -0.01 MMBTU/hr
 Hydrocarbon Recovery: 1.13 bbls/day
 Produced Water: 0.39 bbls/day
 VOC Control Efficiency: 75.69 %
 HAP Control Efficiency: 90.50 %
 BTEX Control Efficiency: 91.32 %
 Dissolved Hydrocarbons in Water: 476.87 mg/L

Component	Emitted (wt. %)	Condensed (wt. %)
Carbon Dioxide	98.42	1.58
Hydrogen Sulfide	95.07	4.93
Nitrogen	99.86	0.14
Methane	99.52	0.48
Ethane	96.99	3.01
Propane	90.58	9.42
i-Butane	79.36	20.64
n-Butane	71.56	28.44
i-Pentane	48.78	51.22
n-Pentane	41.04	58.96
Cyclopentane	29.40	70.60
n-Hexane	17.30	82.70
Cyclohexane	12.82	87.18
n-Heptane	6.01	93.99
Methylcyclohexane	5.96	94.04
2,2,4-Trimethylpentane	6.68	93.32
Benzene	13.93	86.07
Toluene	4.62	95.38
Ethylbenzene	1.41	98.59
o-Xylene	1.30	98.70
m-Xylene	1.39	98.61
p-Xylene	1.45	98.55
Triethylene Glycol	0.00	100.00
Ethylene Glycol	0.00	0.00
Water	1.36	98.64
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00

ABSORBER

Absorber Stages: 3.00
 Dry Gas Dew Point: 2.83 lb H2O/MMSCF
 Temperature: 110.00 deg. F
 Pressure: 969.40 psia
 Dry Gas Flow Rate: 2.43 MMSCFD
 TEG Losses with Dry Gas: 0.03 lb/hr
 Wet Gas Water Content: 58.86 lb H2O/MMSCF
 Lean Glycol Recirc. Ratio: 42.97 gal/lb H2O

Component	In Dry Gas (%)	Absorbed in Glycol (%)
Carbon Dioxide	97.78	2.22
Hydrogen Sulfide	90.22	9.78
Nitrogen	99.94	0.06
Methane	99.79	0.21
Ethane	99.37	0.63
Propane	98.98	1.02
i-Butane	98.84	1.16
n-Butane	98.29	1.71
i-Pentane	97.88	2.12
n-Pentane	97.31	2.69
Cyclopentane	87.01	12.99
n-Hexane	95.95	4.05
Cyclohexane	85.74	14.26
n-Heptane	93.30	6.70
Methylcyclohexane	85.00	15.00
2,2,4-Trimethylpentane	93.65	6.35
Benzene	26.45	73.55
Toluene	16.39	83.61
Ethylbenzene	18.84	81.16
o-Xylene	17.02	82.98
m-Xylene	18.25	81.75
p-Xylene	18.89	81.11
Triethylene Glycol	0.00	100.00
Ethylene Glycol	-	-
Water	1.07	98.93
Methanol	-	-
O2	-	-
SO2	-	-

FLASH TANK

Flash Temperature: 80 deg. F

Flash Pressure: 40 psig

Component	Flashed (wt. %)	Left in Glycol (wt. %)
Carbon Dioxide	91.16	8.84
Hydrogen Sulfide	66.26	33.74
Nitrogen	99.87	0.13
Methane	99.34	0.66
Ethane	97.07	2.93
Propane	93.68	6.32
i-Butane	90.97	9.03
n-Butane	86.45	13.55
i-Pentane	78.65	21.35
n-Pentane	74.29	25.71
Cyclopentane	37.85	62.15
n-Hexane	59.92	40.08
Cyclohexane	28.49	71.51
n-Heptane	37.76	62.24
Methylcyclohexane	22.59	77.41
2,2,4-Trimethylpentane	38.54	61.46
Benzene	5.20	94.80
Toluene	2.48	97.52
Ethylbenzene	1.34	98.66
o-Xylene	0.89	99.11
m-Xylene	1.28	98.72
p-Xylene	1.41	98.59
Triethylene Glycol	0.00	100.00
Ethylene Glycol	0.00	0.00
Water	0.17	99.83
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00

REGENERATOR

Component	Recovered in Glycol (%)	Distilled Overhead (%)
Carbon Dioxide	0.00	100.00
Hydrogen Sulfide	0.01	99.99
Nitrogen	0.00	100.00
Methane	0.00	100.00
Ethane	0.00	100.00
Propane	0.00	100.00
i-Butane	0.00	100.00
n-Butane	0.00	100.00
i-Pentane	0.00	100.00
n-Pentane	0.00	100.00
Cyclopentane	0.10	99.90
n-Hexane	0.04	99.96
Cyclohexane	0.24	99.76
n-Heptane	0.04	99.96
Methylcyclohexane	0.35	99.65
2,2,4-Trimethylpentane	0.03	99.97
Benzene	4.47	95.53
Toluene	15.32	84.68
Ethylbenzene	35.76	64.24
o-Xylene	50.41	49.59
m-Xylene	36.54	63.46
p-Xylene	34.43	65.57
Triethylene Glycol	100.00	0.00
Ethylene Glycol	-	-
Water	78.31	21.69
Methanol	-	-
O2	-	-
SO2	-	-

STREAM REPORTS:

WET GAS STREAM

Temperature: 100.00 deg F
 Pressure: 964.40 psia
 Flow Rate: 2.45 MMSCFD

Component	Conc. (mol%)	Mass Flow (lb/h)
Carbon Dioxide	0.87	102.36
Hydrogen Sulfide	0.00	0.09
Nitrogen	1.81	136.49
Methane	76.65	3304.54
Ethane	10.51	849.61
Propane	6.53	774.03
i-Butane	0.48	74.46
n-Butane	1.76	274.59
i-Pentane	0.32	62.92
n-Pentane	0.38	72.87
Cyclopentane	0.04	6.98
n-Hexane	0.09	21.65
Cyclohexane	0.04	8.55
n-Heptane	0.31	83.98
Methylcyclohexane	0.04	9.60
2,2,4-Trimethylpentane	0.02	6.80
Benzene	0.01	2.77
Toluene	0.01	1.70
Ethylbenzene	0.00	0.35
o-Xylene	0.00	0.16
m-Xylene	0.00	0.17
p-Xylene	0.00	0.17
Triethylene Glycol	0.00	0.00
Ethylene Glycol	0.00	0.00
Water	0.12	6.00
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	5800.83

DRY GAS STREAM

Temperature: 104.65 deg F
 Pressure: 959.40 psia
 Flow Rate: 2.43 MMSCFD

Component	Conc. (mol%)	Mass Flow (lb/h)
Carbon Dioxide	0.85	100.08
Hydrogen Sulfide	0.00	0.08
Nitrogen	1.82	136.41
Methane	76.91	3297.43
Ethane	10.51	844.25
Propane	6.50	766.13
i-Butane	0.47	73.59
n-Butane	1.74	269.89
i-Pentane	0.32	61.58
n-Pentane	0.37	70.91
Cyclopentane	0.03	6.07
n-Hexane	0.09	20.77
Cyclohexane	0.03	7.33
n-Heptane	0.29	78.36
Methylcyclohexane	0.03	8.16
2,2,4-Trimethylpentane	0.02	6.36
Benzene	0.00	0.76
Toluene	0.00	0.32
Ethylbenzene	0.00	0.10
o-Xylene	0.00	0.05
m-Xylene	0.00	0.05
p-Xylene	0.00	0.05
Triethylene Glycol	0.00	0.03
Ethylene Glycol	0.00	0.00
Water	0.01	0.29
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	5749.05

LEAN GLYCOL STREAM

Temperature: 110.00 deg F
Pressure: 969.40 psia
Flow Rate: 4.30 sgpm

Component	Conc. (wt%)	Mass Flow (lb/h)
Carbon Dioxide	0.00	0.00
Hydrogen Sulfide	0.00	0.00
Nitrogen	0.00	0.00
Methane	0.00	0.00
Ethane	0.00	0.00
Propane	0.00	0.00
i-Butane	0.00	0.00
n-Butane	0.00	0.00
i-Pentane	0.00	0.00
n-Pentane	0.00	0.00
Cyclopentane	0.00	0.00
n-Hexane	0.00	0.00
Cyclohexane	0.00	0.00
n-Heptane	0.00	0.00
Methylcyclohexane	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00
Benzene	0.00	0.09
Toluene	0.01	0.23
Ethylbenzene	0.01	0.16
o-Xylene	0.01	0.14
m-Xylene	0.00	0.08
p-Xylene	0.00	0.07
Triethylene Glycol	99.11	2405.21
Ethylene Glycol	0.00	0.00
Water	0.86	20.85
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	2426.83

RICH GLYCOL STREAM

Temperature: 101.96 deg F
Pressure: 964.40 psia
Flow Rate: 5.02 sgpm

Component	Conc. (wt%)	Mass Flow (lb/h)
Carbon Dioxide	0.15	3.95
Hydrogen Sulfide	0.00	0.01
Nitrogen	0.09	2.31
Methane	2.37	61.03
Ethane	0.75	19.22
Propane	0.80	20.54
i-Butane	0.08	2.08
n-Butane	0.36	9.18
i-Pentane	0.09	2.36
n-Pentane	0.12	3.15
Cyclopentane	0.04	1.02
n-Hexane	0.05	1.23
Cyclohexane	0.05	1.36
n-Heptane	0.27	6.99
Methylcyclohexane	0.06	1.60
2,2,4-Trimethylpentane	0.02	0.54
Benzene	0.08	2.15
Toluene	0.06	1.64
Ethylbenzene	0.02	0.42
o-Xylene	0.01	0.25
m-Xylene	0.01	0.21
p-Xylene	0.01	0.20
Triethylene Glycol	93.47	2405.18
Ethylene Glycol	0.00	0.00
Water	1.04	26.66
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	2573.27

FLASH TANK OFF GAS STREAM

Temperature: 80.00 deg F
 Pressure: 54.40 psia
 Flow Rate: 2004.64 scfh
 btu value: 1215.80 btu/scf

Component	Conc. (mol%)	Mass Flow (lb/h)
Carbon Dioxide	1.55	3.60
Hydrogen Sulfide	0.00	0.01
Nitrogen	1.56	2.30
Methane	71.55	60.63
Ethane	11.75	18.66
Propane	8.26	19.24
i-Butane	0.62	1.89
n-Butane	2.58	7.93
i-Pentane	0.49	1.86
n-Pentane	0.61	2.34
Cyclopentane	0.10	0.39
n-Hexane	0.16	0.74
Cyclohexane	0.09	0.39
n-Heptane	0.50	2.64
Methylcyclohexane	0.07	0.36
2,2,4-Trimethylpentane	0.03	0.21
Benzene	0.03	0.11
Toluene	0.01	0.04
Ethylbenzene	0.00	0.01
o-Xylene	0.00	0.00
m-Xylene	0.00	0.00
p-Xylene	0.00	0.00
Triethylene Glycol	0.00	0.00
Ethylene Glycol	0.00	0.00
Water	0.05	0.04
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	123.39

FLASH TANK GLYCOL STREAM

Temperature: 80.00 deg F
 Pressure: 54.40 psia
 Flow Rate: 4.36 sgpm

Component	Conc. (wt%)	Mass Flow (lb/h)
Carbon Dioxide	0.01	0.35
Hydrogen Sulfide	0.00	0.00
Nitrogen	0.00	0.00
Methane	0.02	0.40
Ethane	0.02	0.56
Propane	0.05	1.30
i-Butane	0.01	0.19
n-Butane	0.05	1.24
i-Pentane	0.02	0.50
n-Pentane	0.03	0.81
Cyclopentane	0.03	0.63
n-Hexane	0.02	0.49
Cyclohexane	0.04	0.97
n-Heptane	0.18	4.35
Methylcyclohexane	0.05	1.24
2,2,4-Trimethylpentane	0.01	0.33
Benzene	0.08	2.03
Toluene	0.07	1.60
Ethylbenzene	0.02	0.41
o-Xylene	0.01	0.25
m-Xylene	0.01	0.20
p-Xylene	0.01	0.20
Triethylene Glycol	98.18	2405.18
Ethylene Glycol	0.00	0.00
Water	1.09	26.62
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	2449.88

REGENERATOR OVERHEADS STREAM

Temperature: 185.29 deg F
Pressure: 14.10 psia
Flow Rate: 218.33 scfh
btu value: 1476.25 btu/scf

Component	Conc. (mol%)	Mass Flow (lb/h)
Carbon Dioxide	1.38	0.35
Hydrogen Sulfide	0.02	0.00
Nitrogen	0.02	0.00
Methane	4.34	0.40
Ethane	3.25	0.56
Propane	5.12	1.30
i-Butane	0.56	0.19
n-Butane	3.72	1.24
i-Pentane	1.22	0.50
n-Pentane	1.95	0.81
Cyclopentane	1.57	0.63
n-Hexane	0.99	0.49
Cyclohexane	2.00	0.97
n-Heptane	7.55	4.35
Methylcyclohexane	2.18	1.23
2,2,4-Trimethylpentane	0.51	0.33
Benzene	4.33	1.94
Toluene	2.55	1.35
Ethylbenzene	0.43	0.26
o-Xylene	0.20	0.12
m-Xylene	0.21	0.13
p-Xylene	0.21	0.13
Triethylene Glycol	0.00	0.00
Ethylene Glycol	0.00	0.00
Water	55.69	5.77
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	23.09

BTEX CONDENSER VENT GAS STREAM

Temperature: 80.00 deg F
Pressure: 14.10 psia
Flow Rate: 45.84 scfh

Component	Conc. (mol%)	Mass Flow (lb/h)
Carbon Dioxide	6.45	0.34
Hydrogen Sulfide	0.08	0.00
Nitrogen	0.09	0.00
Methane	20.56	0.40
Ethane	15.02	0.55
Propane	22.07	1.18
i-Butane	2.12	0.15
n-Butane	12.68	0.89
i-Pentane	2.82	0.25
n-Pentane	3.82	0.33
Cyclopentane	2.20	0.19
n-Hexane	0.82	0.09
Cyclohexane	1.22	0.12
n-Heptane	2.16	0.26
Methylcyclohexane	0.62	0.07
2,2,4-Trimethylpentane	0.16	0.02
Benzene	2.87	0.27
Toluene	0.56	0.06
Ethylbenzene	0.03	0.00
o-Xylene	0.01	0.00
m-Xylene	0.01	0.00
p-Xylene	0.01	0.00
Triethylene Glycol	0.00	0.00
Ethylene Glycol	0.00	0.00
Water	3.60	0.08
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	5.26

BTEX CONDENSER RECOVERED OIL STREAM

Temperature: 80.00 deg F
Pressure: 14.10 psia
Flow Rate: 0.03 sgpm

Component	Conc. (mol%)	Mass Flow (lb/h)
Carbon Dioxide	0.08	0.01
Hydrogen Sulfide	0.00	0.00
Nitrogen	0.00	0.00
Methane	0.09	0.00
Ethane	0.41	0.02
Propane	2.00	0.12
i-Butane	0.48	0.04
n-Butane	4.39	0.35
i-Pentane	2.59	0.26
n-Pentane	4.78	0.48
Cyclopentane	4.60	0.45
n-Hexane	3.42	0.41
Cyclohexane	7.25	0.85
n-Heptane	29.46	4.09
Methylcyclohexane	8.52	1.16
2,2,4-Trimethylpentane	1.97	0.31
Benzene	15.44	1.67
Toluene	10.11	1.29
Ethylbenzene	1.76	0.26
o-Xylene	0.83	0.12
m-Xylene	0.86	0.13
p-Xylene	0.86	0.13
Triethylene Glycol	0.00	0.00
Ethylene Glycol	0.00	0.00
Water	0.09	0.00
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	12.13

BTEX CONDENSER PRODUCED WATER STREAM

Temperature: 80.00 deg F
Pressure: 14.10 psia
Flow Rate: 0.01 sgpm

Component	Conc. (mol%)	Mass Flow (lb/h)
Carbon Dioxide	0.00	0.00
Hydrogen Sulfide	0.00	0.00
Nitrogen	0.00	0.00
Methane	0.00	0.00
Ethane	0.00	0.00
Propane	0.00	0.00
i-Butane	0.00	0.00
n-Butane	0.00	0.00
i-Pentane	0.00	0.00
n-Pentane	0.00	0.00
Cyclopentane	0.00	0.00
n-Hexane	0.00	0.00
Cyclohexane	0.00	0.00
n-Heptane	0.00	0.00
Methylcyclohexane	0.00	0.00
2,2,4-Trimethylpentane	0.00	0.00
Benzene	0.01	0.00
Toluene	0.00	0.00
Ethylbenzene	0.00	0.00
o-Xylene	0.00	0.00
m-Xylene	0.00	0.00
p-Xylene	0.00	0.00
Triethylene Glycol	0.00	0.00
Ethylene Glycol	0.00	0.00
Water	99.98	5.69
Methanol	0.00	0.00
O2	0.00	0.00
SO2	0.00	0.00
Total Components	100.00	5.70