Denbury

August 2, 2024

Mississippi Department of Environmental Quality
Office of Pollution Control
Environmental Permits Division
515 E. Amite Street
Jackson, MS 39201

RE: Notice of Intent for Coverage Under the Oil Production General Permit
Denbury Onshore, LLC
Cranfield Central Facility
AI No.: 222; Permit No.: 0040-00019
Adams County, MS

In accordance with MAC Title 11, Part 2, submitted with this are two (2) bound sets of the referenced material. An electronic copy has also been submitted through the EPD Electronic Application Submittal webpage. Request is hereby made for coverage under the Oil Production General Permit (OPGP).

The facility functions as an oil & gas production site and operates controls such that criteria pollutant emissions will not exceed emission rates restricted in the Oil Production General Permit, nor will hazardous air pollutant (HAP) emissions exceed any HAP emission rates restricted in the Oil Production General Permit. Details of the operations, emission estimates, and associated emission programs are included herein and verify that the facility should be classified as a synthetic minor source under the State and Federal air permitting programs. All measures should be taken in the review process to assure that the minor classification is federally recognized.

A copy of the public notice is enclosed and will be published in the Natchez Democrat. Additionally, a copy of the public notice and the complete OPGP NOI will be provided to the Judge George W Armstrong Library. The public notice, notarized proof of publication, and library proof of receipt will be submitted to MDEQ when available.

If any other information is required regarding these matters, please do not hesitate to contact HLP Engineering, Inc. at (337) 839-1075. All written correspondence should be directed to my attention at: **Denbury Onshore, LLC, 5851 Legacy Circle, Suite 1200, Plano, TX 75024**. Thank you in advance for your assistance with this matter.

Sincerely,
DENBURY ONSHORE, LLC

Kevin Hendricks
Enclosures

Notice of Intent for Oil Production General Permit

Denbury Onshore, LLC

Cranfield Central Facility
Adams County, MS

August 2024

Table of Contents

AI: 222 rec'd 8/6/2024 via email MSOPGP0040-00019

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Facility (Agency Interest) Information | **Section OPGP - A**

1. Name, Address, and Location of Facility

A. Owner/Company Name: Denbury Onshore, LLC

B. Facility Name (*if different than A. above*) : Cranfield Central Facility

C. Facility Air Permit/Coverage No. *(if known)* : 0040-00019

D. Agency Interest No. *(if known)* : 222

E. Physical Address

1. Street Address: See driving directions below

This facility is located approximately 2 miles northeasterly of Cranfield, MS. From the intersection of Cranfield Road and Old Highway 84, travel northeast on Old Highway 84 approximately 1.9 miles to Tate Road. Travel northeast on Tate Road approximately 0.1 mile to US Highway 84. Travel east on US Highway 84 approximately 0.2 mile to the facility located on the north side of the road.

2. City: Cranfield 3. State: MS
4. County: Adams 5. Zip Code: 39661
6. Telephone No.: 972-673-2529 7. Fax No.:
8. Are facility records kept at this location? ☐ Yes ☑ No. Please complete Item 10.

F. Mailing Address

1. Street Address or P.O. Box: 5851 Legacy Circle, Suite 1200
2. City: Plano 3. State: TX
4. Zip Code: 75024

G. Latitude/Longitude Data

1. Collection Point (*check one*):
   ☑ Site Entrance ☐ Other:
2. Method of Collection (*check one*):
   ☐ GPS Specify coordinate system (NAD 83, etc.)
   ☑ Map Interpolation (Google Earth, etc.) ☐ Other:
3. Latitude (*degrees/minutes/seconds)* : 31 33 16.14
4. Longitude (*degrees/minutes/seconds*): 91 10 21.45
5. Elevation (*feet*): 375±

H. SIC Code: 1311

2. Name and Address of Facility Contact

A. Name: Kevin Hendricks Title: Environmental Compliance Coordinator

B. Mailing Address

1. Street Address or P.O. Box: 5851 Legacy Circle, Suite 1200
2. City: Plano 3. State: TX
4. Zip Code: 75024 5. Fax No.:
6. Telephone No.: 972-673-2529
7. Email: kevin.hendricks@exxonmobil.com

TRM

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Facility (Agency Interest) Information | **Section OPGP - A**

3. Name and Address of Air Contact (*if different from Facility Contact*)

A. Name: _____ Title: _____

B. Mailing Address
1. Street Address or P.O. Box: _____
2. City: _____ 3. State: _____
4. Zip Code: _____ 5. Fax No.: _____
6. Telephone No.: _____
7. Email: _____

4. Name and Address of Responsible Official for the Facility

The Form must be signed by a Responsible Official as defined in 11 Miss. Admin. Code Pt.2, R. 2.1.C(24).

A. Name: Rusty Shaw Title: Director of Regulatory Affairs

B. Mailing Address
1. Street Address or P.O. Box: 5851 Legacy Circle, Suite 1200
2. City: Plano 3. State: TX
4. Zip Code: 75024 5. Fax No.: _____
6. Telephone No.: 972-673-2777
7. Email: rusty.shaw@exxonmobil.com

C. Is the person above a duly authorized representative and not a corporate officer?
☑ Yes ☐ No
If yes, has written notification of such authorization been submitted to MDEQ?
☑ Yes ☐ No ☐ Request for authorization is attached

5. Type of Oil Production Notice of Intent (*Check all that apply*)

☑ Initial Coverage
☐ Re-Coverage for existing Coverage
☐ Modification with Public Notice
☐ Modification without Public Notice
☐ Update Compliance Plan

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Facility (Agency Interest) Information | **Section OPGP - A**

6. Equipment List (*Check all that apply*)

Complete supporting emission calculations must be included for each potential emission unit selected below.

- ☐ Heater Treater. Include a completed Section OPGP-C Form for each unit.
- ☑ Condensation Storage Vessel. Include a completed Section OPGP-E Form for each unit.
- ☑ Water Storage Vessel. Include a completed Section OPGP-E Form for each unit.
- ☐ Internal Combustion Engine. Include a completed Section OPGP-D Form for each unit.
- ☑ Flare. Include a completed Section OPGP-F Form for each unit.
- ☐ Oil Truck Loading (Section OPGP-B Form)
- ☑ Component Fugitive Emissions (Section OPGP-B Form)
- ☑ Other: Compressor Blowdowns, Heater Treater Flash Gas, & Water Flash Drum Flash Gas

7. Process/Product Details

Maximum Anticipated Well(s) Production for Facilty:

Produced Material	Throughput	Units
Gas		MMCF/day
Oil	3,000	barrels/day
Water	10,000	barrels/day
Other (Specify)		

Maximum Anticipated Throughput for Principal Product(s) (*as applicable*):

Produced Material	Throughput	Units
Flared Gas	0.33	MMCF/day
Oil	3,000	barrels/day
Water	10,000	barrels/day
Other (Specify)		

8. Zoning

A. Is the facility (either existing or proposed) located in accordance with any applicable city and/or county zoning ordinances? If no, please explain
Yes

B. Is the facility (either existing or proposed) required to obtain any zoning variance to locate/expand the facility at this site? If yes, please explain.
No

C. Is the required USGS quadrangle map or equivalent attached? ☑ Yes ☐ No

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Facility (Agency Interest) Information | **Section OPGP - A**

9. MS Secretary of State Registration / Certificate of Good Standing

No permit will be issued to a company that is not authorized to conduct business in Mississippi. If the company applying for the permit is a corporation, limited liability company, a partnership or a business trust, the application package should include proof of registration with the Mississippi Secretary of State and/or a copy of the company's Certificate of Good Standing. The name listed on the permit will include the company name as it is registered with the Mississippi Secretary of State.

It should be noted that for an application submitted in accordance with 11 Miss. Admin. Code Pt. 2, R. 2.8.B. to renew a State Permit to Operate or in accordance with 11 Miss. Admin. Code Pt. 2, R. 6.2.A(1)(c). to renew a Title V Permit to be considered timely and complete, the applicant shall be registered and in good standing with the Mississippi Secretary of State to conduct business in Mississippi.

10. Address and Location of Facility Records

Physical Address

1. Street Address: 5851 Legacy Circle, Suite 1200
2. City: Plano
3. State: TX
4. County: Collin
5. Zip Code: 75024
6. Telephone No.: 972-673-2529
7. Fax No.:

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Facility (Agency Interest) Information | **Section OPGP - A**

11. Certification

The Form must be signed by a Responsible Official as defined in 11 Miss. Admin. Code Pt. 2, R. 2.1.C.(24).

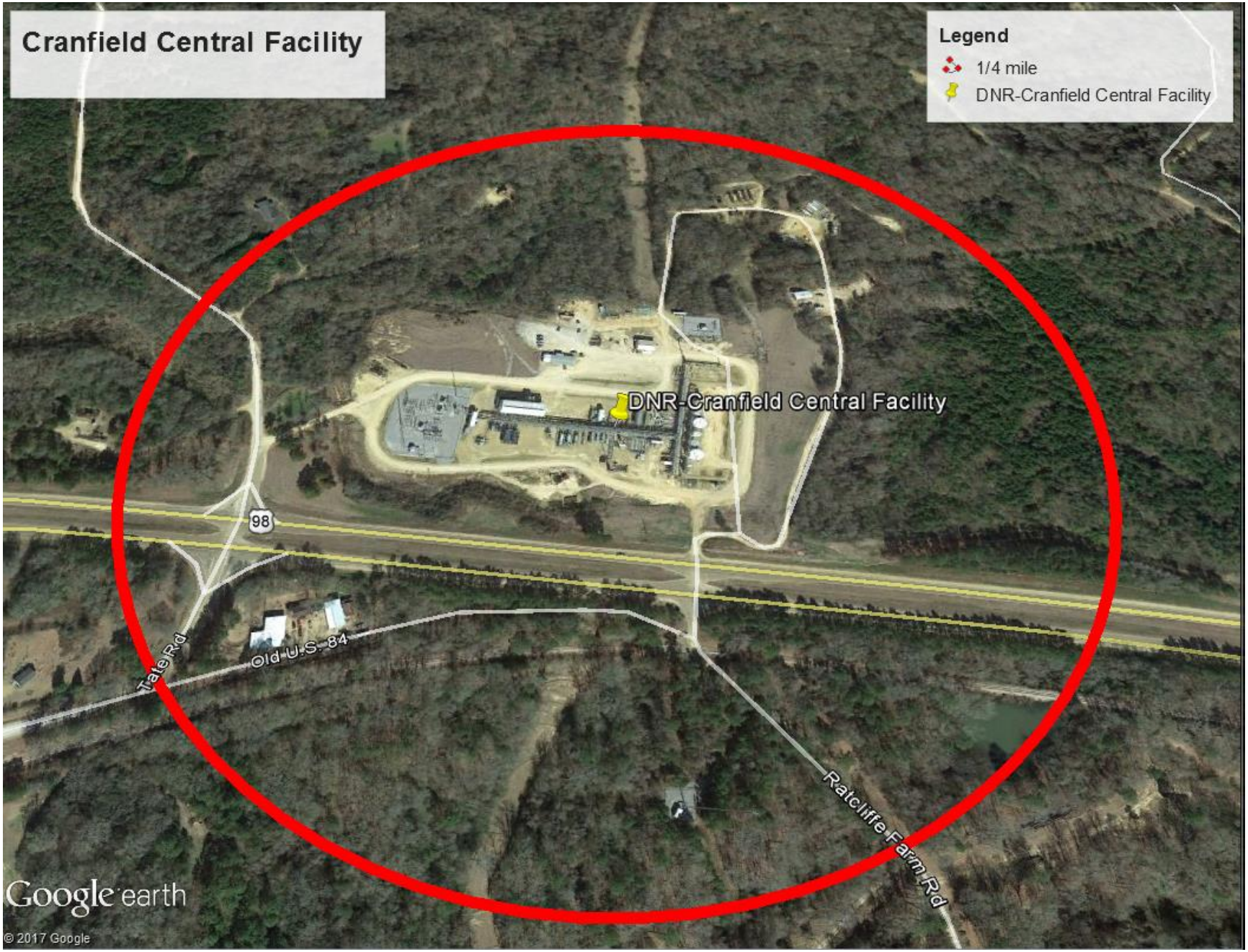
I certify that to the best of my knowledge and belief formed after reasonable inquiry, the statements and information in this application are true, complete, and accurate, and that as a responsible official, my signature shall constitute an agreement that the applicant assumes the responsibility for any alteration, additions, or changes in operation that may be necessary to achieve and maintain compliance with all applicable Rules and Regulations. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Rusty Shaw — **Signature of Responsible Official/DAR**

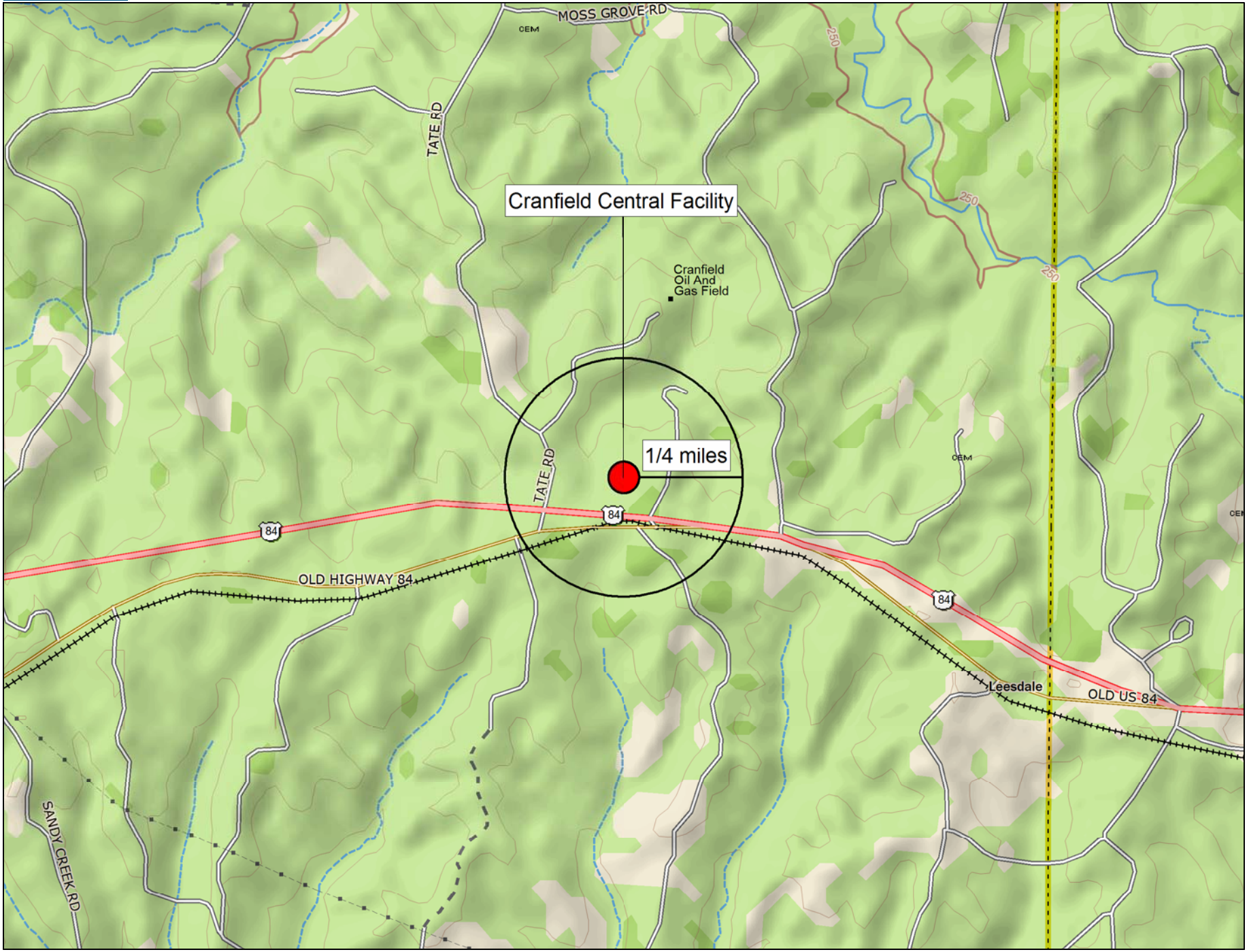
7/30/24 — **Date**

Rusty Shaw — **Printed Name**

7/30/24 — **Date**


Cranfield Central Facility
Legend
1/4 mile
DNR-Cranfield Central Facility
DNR-Cranfield Central Facility
98
Tate Rd
Old U.S. 84
Ratcliffe Farm Rd
Google earth
© 2017 Google


DNR-Cranfield Central Facility



TN

MN (0.3°W)

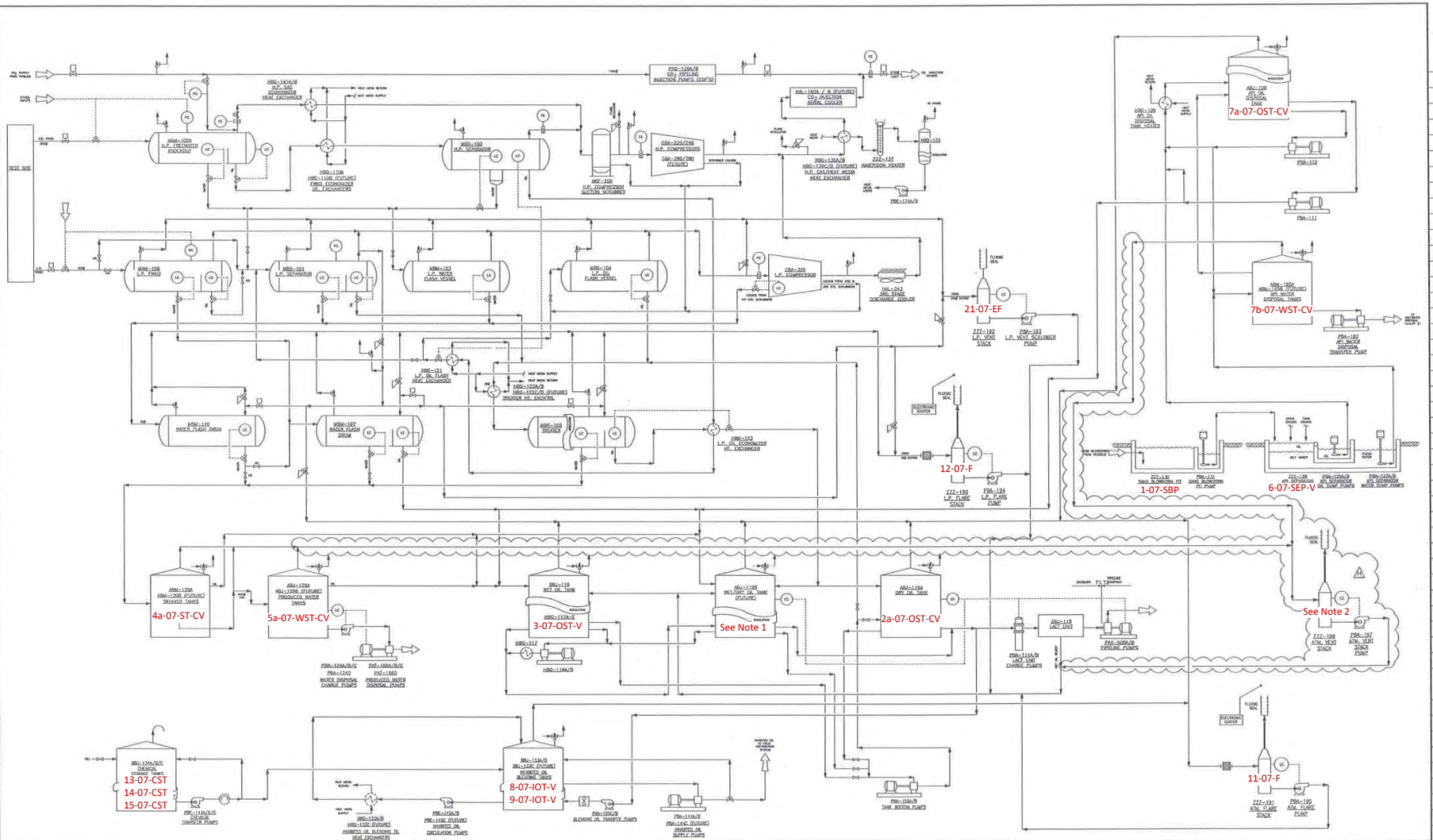
Scale 1 : 20,000

0 600 1200 1800 2400 3000 ft

0 180 360 540 720 900 m

1" = 1,666.7 ft

Data Zoom 13-1



NOTES:

NOTES:
1) Source ABJ-119B has been removed.
2) Source ZZZ-196 has not been installed.

No.	DRN. BY	CHK'D.	APP.	DATE	REVISION DESCRIPTION
	ZEN		JH	1/2/13	TANK VENT RE-ROUTE – ISSUED FOR APPROVAL
	MAK			8/13/10	WATER HANDLING UPGRADE
	EXC			2/6/08	PHASE 2 REVISIONS
	LJS			5/2/07	ISSUED FOR DISCUSSION
-	RT			10/20/06	ISSUED FOR DISCUSSION
C	LE			9/26/06	ISSUED FOR DISCUSSION
B	LE			9/19/06	ISSUED FOR DISCUSSION
A	JT			5/18/06	ISSUED FOR DISCUSSION

W. H. LINDER
& Associates, Inc.
Consulting Engineers

METAIRIE, LA.
3330 W. ESPLANADE AVENUE, Suite 300
METAIRIE, LOUISIANA 70002
Tel: (504) 835-2577 Fax: (504) 837-5924

HOUSTON, TX.
653 N. SAM HOUSTON PKWY E., Suite 350
HOUSTON, TEXAS 77060
Tel: (281) 448-9665 Fax: (281) 448-9724

DATE:

Denbury Onshore, LLC

PROJECT MANAGER: J. HANSON	DESCRIPTION: CRANFIELD CENTRAL FACILITY
AREA:	
SITE No.:	DATE: 5/18/06
DRN. BY: JT	SCALE: NTS
CADD. FILE:	CHANGED DATE: 1/2/13
DWG. No.: C-SPFD-CF	
DRAWING TITLE: SIMPLIFIED PROCESS FLOW DIAGRAM CENTRAL FACILITY	REV. No.: 1 REV. DATE: 1/2/13

DWG: C:\TEMP0\WSU\LUM\WSYDenburyCranfield\GENERAL\C010065\00001\C\C-SPFD-CF.dwg USER: malleyaa
DATE: Jan 28, 2013 3:07pm

Section OPGP-B.1: Maximum Uncontrolled Emissions (under normal operating conditions)

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Maximum Uncontrolled Emissions are the emissions at maximum capacity and prior to (in the absence of) pollution control, emission-reducing process equipment, or any other emission reduction. Calculate the hourly emissions using the worst case hourly emissions for each pollutant. For each pollutant, calculate the annual emissions as if the facility were operating at maximum plant capacity without pollution controls for 8760 hours per year, unless otherwise approved by the Department. List Hazardous Air Pollutants (HAP) in Section OGP-B.3 and GHGs in Section OGP-B.4. Emission Point numbering must be consistent throughout the application package. Fill all cells in this table with the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected. Emissions > 0.01 TPY must be included. Please do not change the column widths on this table.

Emission Point ID	TSP[1] (PM)		PM-10[1]		PM-2.5[1]		SO_2		NOx		CO		VOC		TRS[2]		Lead		Total HAPs	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
1-07-SBP	-	-	-	-	-	-	-	-	-	-	-	-	5.16	1.88	0.00	0.00	-	-	0.34	0.12
2a-07-OST-CV	-	-	-	-	-	-	-	-	-	-	-	-	77.62	339.99	0.02	0.07	-	-	4.46	19.54
3-07-OST-V	-	-	-	-	-	-	-	-	-	-	-	-	0.45	1.98	0.00	0.00	-	-	0.04	0.18
4a-07-ST-CV	-	-	-	-	-	-	-	-	-	-	-	-	8.13	35.64	0.00	0.01	-	-	0.57	2.54
5a-07-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	6.36	27.84	0.00	0.01	-	-	0.42	1.87
6-07-SEP-V	-	-	-	-	-	-	-	-	-	-	-	-	0.63	2.75	0.00	0.00	-	-	0.06	0.25
7a-07-OST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.26	1.17	0.00	0.00	-	-	0.02	0.10
7b-07-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.26	1.13	0.00	0.00	-	-	0.01	0.08
8-07-IOT-V	-	-	-	-	-	-	-	-	-	-	-	-	4.81	21.09	0.00	0.00	-	-	0.44	1.94
9-07-IOT-V	-	-	-	-	-	-	-	-	-	-	-	-	4.81	21.09	0.00	0.00	-	-	0.44	1.94
11-07-F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12-07-F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13-07-CST	-	-	-	-	-	-	-	-	-	-	-	-	0.01	0.04	0.00	0.00	-	-	0.00	0.00
14-07-CST	-	-	-	-	-	-	-	-	-	-	-	-	0.01	0.04	0.00	0.00	-	-	0.00	0.00
15-07-CST	-	-	-	-	-	-	-	-	-	-	-	-	0.04	0.16	0.00	0.00	-	-	0.00	0.00
16-07-CB	-	-	-	-	-	-	-	-	-	-	-	-	58.38	1.40	0.03	0.00	-	-	3.82	0.09
17-07-CB	-	-	-	-	-	-	-	-	-	-	-	-	58.38	0.35	0.03	0.00	-	-	3.82	0.02
18-07-HT-WG	-	-	-	-	-	-	-	-	-	-	-	-	94.01	411.76	0.02	0.11	-	-	7.83	34.29
19-07-WFD-WG	-	-	-	-	-	-	-	-	-	-	-	-	1.78	7.81	0.00	0.01	-	-	0.12	0.51
20-07-FE	-	-	-	-	-	-	-	-	-	-	-	-	0.34	1.47	0.00	0.00	-	-	0.01	0.07
21-07-EF	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22-17-GST	-	-	-	-	-	-	-	-	-	-	-	-	0.10	0.44	0.00	0.00	-	-	0.00	0.01
23-17-DST	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00
Totals	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**321.75**	**878.95**	**0.10**	**0.21**	**0.00**	**0.00**	**22.41**	**63.59**

[1] **Condensables:** Include condensable particulate matter emissions in particulate matter calculations for PM-10 and PM-2.5, but not for TSP (PM).

[2] **TRS:** Total reduced sulfur (TRS) is the sum of the sulfur compounds hydrogen sulfide (H_2S), methyl mercaptan (CH_4S), dimethyl sulfide (C_2H_6S), and dimethyl disulfide ($C_2H_6S_2$).

Section OPGP-B.2: Proposed Allowable Emissions

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Proposed Allowable Emissions (Potential to Emit) are those emissions the facility is currently permitted to emit as limited by a specific permit requirement or federal/state standard (e.g., a MACT standard); or the emission rate at which the facility proposes to emit considering emissions control devices, restrictions to operating rates/hours, or other requested permit limits that reduce the maximum emission rates. Emission Point numbering must be consistent throughout the application package. Fill all cells in this table with the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected. Additional columns may be added if there are regulated pollutants (other than HAPs and GHGs) emitted at the facility.

Emission Point ID	TSP[1]		PM10[1]		PM2.5[1]		SO_2		NOx		CO		VOC		TRS		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
1-07-SBP	-	-	-	-	-	-	-	-	-	-	-	-	5.16	1.88	0.00	0.00	-	-
2a-07-OST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.20	0.89	0.00	0.00	-	-
3-07-OST-V	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.01	0.00	0.00	-	-
4a-07-ST-CV	-	-	-	-	-	-	-	-	-	-	-	-	8.13	35.64	0.00	0.01	-	-
5a-07-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	6.36	27.84	0.00	0.01	-	-
6-07-SEP-V	-	-	-	-	-	-	-	-	-	-	-	-	0.63	2.75	0.00	0.00	-	-
7a-07-OST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	-	-
7b-07-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.26	1.13	0.00	0.00	-	-
8-07-IOT-V	-	-	-	-	-	-	-	-	-	-	-	-	0.01	0.02	0.00	0.00	-	-
9-07-IOT-V	-	-	-	-	-	-	-	-	-	-	-	-	0.01	0.02	0.00	0.00	-	-
11-07-F	0.04	0.18	0.04	0.18	0.04	0.18	0.03	0.14	0.17	0.76	1.49	6.52	2.26	9.89	0.00	0.00	-	-
12-07-F	0.11	0.48	0.11	0.48	0.11	0.48	0.05	0.21	0.13	0.57	1.12	4.89	1.51	6.64	0.00	0.00	-	-
13-07-CST	-	-	-	-	-	-	-	-	-	-	-	-	0.01	0.04	0.00	0.00	-	-
14-07-CST	-	-	-	-	-	-	-	-		-	-	-	0.01	0.04	0.00	0.00	-	-
15-07-CST	-	-	-	-	-	-	-	-	-	-	-	-	0.04	0.16	0.00	0.00	-	-
16-07-CB	-	-	-	-	-	-	-	-	-	-	-	-	58.38	1.40	0.03	0.00	-	-
17-07-CB	-	-	-	-	-	-	-	-	-	-	-	-	58.38	0.35	0.03	0.00	-	-
18-07-HT-WG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19-07-WFD-WG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20-07-FE	-	-	-	-	-	-	-	-	-	-	-	-	0.34	1.47	0.00	0.00	-	-
21-07-EF	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22-17-GST	-	-	-	-	-	-	-	-	-	-	-	-	0.10	0.44	0.00	0.00	-	-
23-17-DST	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	-	-
Totals	**0.15**	**0.66**	**0.15**	**0.66**	**0.15**	**0.66**	**0.08**	**0.35**	**0.30**	**1.33**	**2.61**	**11.41**	**141.79**	**90.61**	**0.06**	**0.02**	**0.00**	**0.00**

[1] **Condensables:** Include condensable particulate matter emissions in particulate matter calculations for PM-10 and PM-2.5, but not for TSP (PM).

[2] **TRS:** Total reduced sulfur (TRS) is the sum of the sulfur compounds hydrogen sulfide (H_2S), methyl mercaptan (CH_4S), dimethyl sulfide (C_2H_6S), and dimethyl disulfide ($C_2H_6S_2$).

Section OPGP-B.3: Proposed Allowable Hazardous Air Pollutants (HAPs)

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

In the table below, report the Proposed Allowable Emissions (Potential to Emit) for each HAP from each regulated emission unit if the HAP > 0.01 tpy. Each facility-wide Individual HAP total and the facility-wide Total HAPs shall be the sum of all HAP sources. Use the HAP nomenclature as it appears in the Instructions. Emission Point numbering must be consistent throughout the application package. For each HAP listed, fill all cells in this table with the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected or the pollutant is emitted in a quantity less than the threshold amounts described above. Additional columns may be added as necessary to address each HAP.

Emission Point ID	Total HAPs		1,3-Butadiene		2,2,4-Trimethyl-pentane		Acetaldehyde		Acrolein		Benzene		Ethylbenzene		Formaldehyde		Hydrogen Sulfide		n-Hexane		Methanol		Toluene		Xylenes	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
1-07-SBP	0.34	0.12	-	-	0.00	0.00	-	-	-	-	0.09	0.03	0.00	0.00	-	-	0.00	0.00	0.18	0.07	-	-	0.04	0.01	0.03	0.01
2a-07-OST-CV	0.01	0.03			0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.01	0.03	-	-	0.00	0.00	0.00	0.00
3-07-OST-V	0.00	0.00	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00
4a-07-ST-CV	0.57	2.54	-	-	0.00	0.00	-	-	-	-	0.10	0.45	0.00	0.01	-	-	0.00	0.01	0.40	1.75	-	-	0.04	0.19	0.03	0.13
5a-07-WST-CV	0.42	1.87	-	-	0.00	0.00	-	-	-	-	0.10	0.44	0.00	0.01	-	-	0.00	0.01	0.25	1.09	-	-	0.04	0.19	0.03	0.13
6-07-SEP-V	0.06	0.25	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.06	0.25	-	-	0.00	0.00	0.00	0.00
7a-07-OST-CV	0.00	0.00	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00
7b-07-WST-CV	0.01	0.08	-	-	0.00	0.00	-	-	-	-	0.00	0.02	0.00	0.00	-	-	0.00	0.00	0.01	0.05	-	-	0.00	0.01	0.00	0.00
8-07-IOT-V	0.00	0.00	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00
9-07-IOT-V	0.00	0.00	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00
11-07-F	0.06	0.25	-	-	0.00	0.00	-	-	-	-	0.01	0.03	0.00	0.00	-	-	0.00	0.00	0.05	0.22	-	-	0.00	0.00	0.00	0.00
12-07-F	0.05	0.18	-	-	0.02	0.07	-	-	-	-	0.01	0.03	0.00	0.00	-	-	0.00	0.00	0.02	0.08	-	-	0.00	0.00	0.00	0.00
13-07-CST	0.00	0.00	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00
14-07-CST	0.00	0.00	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00
15-07-CST	0.00	0.00	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00
16-07-CB	3.82	0.09	-	-	0.00	0.00	-	-	-	-	0.99	0.02	0.03	0.00	-	-	0.03	0.00	2.05	0.05	-	-	0.43	0.01	0.29	0.01
17-07-CB	3.82	0.02	-	-	0.00	0.00	-	-	-	-	0.99	0.01	0.03	0.00	-	-	0.03	0.00	2.05	0.01	-	-	0.43	0.00	0.29	0.00
18-07-HT-WG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19-07-WFD-WG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20-07-FE	0.01	0.07	-	-	0.00	0.00	-	-	-	-	0.00	0.02	0.00	0.00	-	-	0.00	0.00	0.01	0.03	-	-	0.00	0.01	0.00	0.01
21-07-EF	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22-17-GST	0.00	0.01	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.01	-	-	0.00	0.00	0.00	0.00
23-17-DST	0.00	0.00	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00
Totals:	**9.17**	**5.51**	**0.00**	**0.00**	**0.02**	**0.07**	**0.00**	**0.00**	**0.00**	**0.00**	**2.29**	**1.05**	**0.06**	**0.02**	**0.00**	**0.00**	**0.06**	**0.02**	**5.09**	**3.64**	**0.00**	**0.00**	**0.98**	**0.42**	**0.67**	**0.29**

Section OPGP-B.4: Greenhouse Gas Emissions

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Applicants must report potential emission rates in SHORT TONS per year, as opposed to metric tons required by Part 98. Emission Point numbering must be consistent throughout the application package and, for existing emission points, should match any MDEQ ID's in the current permit.

		CO_2 (non-biogenic) ton/yr	CO_2 (biogenic)[2] ton/yr	N_2O ton/yr	CH_4 ton/yr	SF_6 ton/yr	PFC/HFC[3] ton/yr					Total GHG Mass Basis ton/yr[5]	Total CO_2e ton/yr[6]
Emission Point ID	**GWPs [1]**	**1**	**1**	**265**	**28**	**22,800**	**footnote 4**						
1-07-SBP	**mass GHG**	74.81	0.00	0.00	3.35	0.00	0.00					78.16	
	CO_2e	74.81	0.00	0.00	93.80	0.00	0.00						168.61
2a-07-OST-CV	**mass GHG**	4.78	0.00	0.00	0.08	0.00	0.00					4.86	
	CO_2e	4.78	0.00	0.00	2.24	0.00	0.00						7.02
3-07-OST-V	**mass GHG**	0.00	0.00	0.00	0.00	0.00	0.00					0.00	
	CO_2e	0.00	0.00	0.00	0.00	0.00	0.00						0.00
4a-07-ST-CV	**mass GHG**	1024.38	0.00	0.00	46.44	0.00	0.00					1070.82	
	CO_2e	1024.38	0.00	0.00	1300.32	0.00	0.00						2324.70
5a-07-WST-CV	**mass GHG**	1024.65	0.00	0.00	46.10	0.00	0.00					1070.75	
	CO_2e	1024.65	0.00	0.00	1290.80	0.00	0.00						2315.45
6-07-SEP-V	**mass GHG**	0.00	0.00	0.00	0.20	0.00	0.00					0.20	
	CO_2e	0.00	0.00	0.00	5.60	0.00	0.00						5.60
7a-07-OST-CV	**mass GHG**	0.01	0.00	0.00	0.00	0.00	0.00					0.01	
	CO_2e	0.01	0.00	0.00	0.00	0.00	0.00						0.01
7b-07-WST-CV	**mass GHG**	40.99	0.00	0.00	1.84	0.00	0.00					42.83	
	CO_2e	40.99	0.00	0.00	51.52	0.00	0.00						92.51
8-07-IOT-V	**mass GHG**	0.04	0.00	0.00	0.00	0.00	0.00					0.04	
	CO_2e	0.04	0.00	0.00	0.00	0.00	0.00						0.04
9-07-IOT-V	**mass GHG**	0.04	0.00	0.00	0.00	0.00	0.00					0.04	
	CO_2e	0.04	0.00	0.00	0.00	0.00	0.00						0.04
11-07-F	**mass GHG**	1397.30	0.00	0.00	26.33	0.00	0.00					1423.63	
	CO_2e	1397.30	0.00	0.00	737.24	0.00	0.00						2134.54
12-07-F	**mass GHG**	5447.17	0.00	0.00	0.95	0.00	0.00					5448.12	
	CO_2e	5447.17	0.00	0.00	26.60	0.00	0.00						5473.77
13-07-CST	**mass GHG**	0.00	0.00	0.00	0.00	0.00	0.00					0.00	
	CO_2e	0.00	0.00	0.00	0.00	0.00	0.00						0.00
14-07-CST	**mass GHG**	0.00	0.00	0.00	0.00	0.00	0.00					0.00	
	CO_2e	0.00	0.00	0.00	0.00	0.00	0.00						0.00
15-07-CST	**mass GHG**	0.00	0.00	0.00	0.00	0.00	0.00					0.00	
	CO_2e	0.00	0.00	0.00	0.00	0.00	0.00						0.00
16-07-CB	**mass GHG**	55.68	0.00	0.00	2.49	0.00	0.00					58.17	
	CO_2e	55.68	0.00	0.00	69.72	0.00	0.00						125.40
17-07-CB	**mass GHG**	13.92	0.00	0.00	0.63	0.00	0.00					14.55	
	CO_2e	13.92	0.00	0.00	17.64	0.00	0.00						31.56
18-07-HT-WG	**mass GHG**	0.00	0.00	0.00	0.00	0.00	0.00					0.00	
	CO_2e	0.00	0.00	0.00	0.00	0.00	0.00						0.00
19-07-WFD-WG	**mass GHG**	0.00	0.00	0.00	0.00	0.00	0.00					0.00	
	CO_2e	0.00	0.00	0.00	0.00	0.00	0.00						0.00
20-07-FE	**mass GHG**	33.09	0.00	0.00	1.49	0.00	0.00					34.58	
	CO_2e	33.09	0.00	0.00	41.72	0.00	0.00						74.81
21-07-EF	**mass GHG**	0.00	0.00	0.00	0.00	0.00	0.00					0.00	
	CO_2e	0.00	0.00	0.00	0.00	0.00	0.00						0.00

		CO_2 (non-biogenic) ton/yr	CO_2 (biogenic)[2] ton/yr	N_2O ton/yr	CH_4 ton/yr	SF_6 ton/yr	PFC/HFC[3] ton/yr					Total GHG Mass Basis ton/yr[5]	Total CO_2e ton/yr[6]
Emission Point ID	**GWPs [1]**	**1**	**1**	**265**	**28**	**22,800**	**footnote 4**						
22-17-GST	**mass GHG**	0.00	0.00	0.00	0.00	0.00	0.00					0.00	
	CO_2e	0.00	0.00	0.00	0.00	0.00	0.00						0.00
23-17-DST	**mass GHG**	0.00	0.00	0.00	0.00	0.00	0.00					0.00	
	CO_2e	0.00	0.00	0.00	0.00	0.00	0.00						0.00
FACILITY TOTAL	**mass GHG**	**9116.86**	**0.00**	**0.00**	**129.90**	**0.00**	**0.00**					**9246.76**	
	CO_2e	**9116.86**	**0.00**	**0.00**	**3637.20**	**0.00**	**0.00**						**12754.06**

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

[2] Biogenic CO2 is defined as carbon dioxide emissions resulting from the combustion or decomposition of non-fossilized and biodegradable organic material originating from plants, animals, or micro-organisms.

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

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

[5] Greenhouse gas emissions on a **mass basis** is the ton per year greenhouse gas emission before adjustment with its GWP. Do not include biogenic CO_2 in this total.

[6] **CO_2e** means Carbon Dioxide Equivalent and is calculated by multiplying the TPY mass emissions of the greenhouse gas by its GWP. Do not include biogenic CO_2e in this total.

Section OPGP-B.5: Stack Parameters and Exit Conditions
MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Emission Point numbering must be consistent throughout the application package.

Emission Point ID	Orientation (H-Horizontal V=Vertical)	Rain Caps (Yes or No)	Height Above Ground (ft)	Base Elevation (ft)	Exit Temp. (^{o}F)	Inside Diameter or Dimensions (ft)	Velocity (ft/sec)	Moisture by Volume (%)	Geographic Position (degrees/minutes/seconds)	
									Latitude	Longitude
2a-07-OST-CV	V	No	24	375±	80	0.5	0.02	0	31 33 16.14	91 10 21.45
3-07-OST-V	V	No	24	375±	80	0.5	<0.01	0	31 33 16.14	91 10 21.45
4a-07-ST-CV	V	No	32	375±	80	0.5	3.33	0	31 33 16.14	91 10 21.45
5a-07-WST-CV	V	No	24	375±	80	0.5	3.32	0	31 33 16.14	91 10 21.45
6-07-SEP-V	H	No	40	375±	80	0.5	0.01	0	31 33 16.14	91 10 21.45
7a-07-OST-CV	V	No	20	375±	80	0.5	<0.01	0	31 33 16.14	91 10 21.45
7b-07-WST-CV	V	No	20	375±	80	0.5	0.13	0	31 33 16.14	91 10 21.45
8-07-IOT-V	V	No	24	375±	80	0.6	<0.01	0	31 33 16.14	91 10 21.45
9-07-IOT-V	V	No	24	375±	80	0.6	<0.01	0	31 33 16.14	91 10 21.45
11-07-F	V	No	25	375±	1500	0.3	1167	0	31 33 16.14	91 10 21.45
12-07-F	V	No	25	375±	1500	0.5	754	0	31 33 16.14	91 10 21.45
13-07-CST	H	No	6	375±	80	0.1	<0.01	0	31 33 16.14	91 10 21.45
14-07-CST	H	No	5	375±	80	0.1	<0.01	0	31 33 16.14	91 10 21.45
15-07-CST	H	No	5	375±	80	0.1	<0.01	0	31 33 16.14	91 10 21.45
22-17-GST	H	No	7	375±	80	0.1	0.18	0	31 33 16.14	91 10 21.45
23-17-DST	H	No	7	375±	80	0.1	<0.01	0	31 33 16.14	91 10 21.45

[1] A WAAS-capable GPS receiver should be used and in the WGS84 or NAD83 coordinate system.

Denbury Onshore, LLC
Cranfield Central Facility
Adams County, MS

Section B.6: EMISSION POINT SOURCE LIST

Facility Ref. No.:	MDEQ EPN:	Footnote:	Emission Point Description:	Routes To:	Operating Rate/Capacity	Operating Schedule:		
						Hrs/Day or (Hrs/Yr)	Days/Wk	Wks/Yr
1-07-SBP	AA-005		Sand Blowdown Pit (ZZZ-130)		250 BBLs/Hr Brine	(730)	-	-
2a-07-OST-CV	AA-007	a	5000 BBL Dry Oil Tank-Common Vent (ABJ-119A)	11-07-F	1,095,000 BOPY	24	7	52.143
3-07-OST-V	AA-009	a	1500 BBL Wet Oil Tank-Common Vent (BBJ-118)	11-07-F	3,650 BOPY	24	7	52.143
4a-07-ST-CV	AA-008		2000 BBL Skimmer Tank-Common Vent (ABJ-120A)		3,650,000 BWPY & 3,650 BOPY	24	7	52.143
5a-07-WST-CV	AA-010		5000 BBL Produced Water Tank-Common Vent (ABJ-129A)		3,650,000 BWPY	24	7	52.143
6-07-SEP-V	AA-014		API Separator-Vent (ZZZ-128)		7,300 BOPY	24	7	52.143
7a-07-OST-CV	AA-012	a	400 BBL API Oil Disposal Tank-Common Vent (ABJ-108)	11-07-F	7,300 BOPY	24	7	52.143
7b-07-WST-CV	AA-013		400 BBL API Water Disposal Tank-Common Vent (ABM-165A)		146,000 BWPY	24	7	52.143
8-07-IOT-V	AA-015	a	1500 BBL Inhibitor Oil Blending Tank-Vent (BBJ-133A)	11-07-F	45,625 BOPY	24	7	52.143
9-07-IOT-V	AA-016	a	1500 BBL Inhibitor Oil Blending Tank-Vent (BBJ-133B)	11-07-F	45,625 BOPY	24	7	52.143
11-07-F	AA-002	b	Atmospheric Control Flare (ZZZ-191)		32.7 MMSCF/Yr	24	7	52.143
12-07-F	AA-003	c	Emergency LP Control Flare (ZZZ-190)		87.8 MMSCF/Yr	24	7	52.143
13-07-CST	AA-017		500 Gallon Chemical Storage Tank (BBJ-134A)		1,500 Gallons/Yr	24	7	52.143
14-07-CST	AA-018		500 Gallon Chemical Storage Tank (BBJ-134B)		2,000 Gallons/Yr	24	7	52.143
15-07-CST	AA-019		2000 Gallon Chemical Storage Tank (BBJ-134C)		12,000 Gallons/Yr	24	7	52.143
16-07-CB	AA-021		High Pressure Compressor Blowdowns		1.11 MMSCF/Yr	(48)	-	-
17-07-CB	AA-020		Low Pressure Compressor Blowdowns		278 MSCF/Yr	(12)	-	-
18-07-HT-WG	AA-001	d	Heater Treater-Flash Gas	12-07-F	78.2 MMSCF/Yr	24	7	52.143
19-07-WFD-WG	AA-022	d	Water Flash Drum-Flash Gas	12-07-F	6.2 MMSCF/Yr	24	7	52.143
20-07-FE	AA-023		Fugitive Emissions		N/A	24	7	52.143
21-07-EF	AA-004	e	Emergency Vent Stack (ZZZ-192)		N/A	-	-	-
22-17-GST	AA-024		1000 Gallon Gasoline Storage Tank		10,000 Gallons/Yr	24	7	52.143
23-17-DST	AA-025		1000 Gallon Diesel Storage Tank		10,000 Gallons/Yr	24	7	52.143

Footnotes:

a *Vapors from this source are routed to the atmospheric control flare (EPN: 11-07-F) for combustion, except during brief intervals when thief hatches are opened for purposes of sampling, gauging, etc.*

b *Routine emission limits for this source account for vapors from the oil storage tanks (EPNs: 2a-07-OST-CV, 3-07-OST-V, 7a-07-OST-CV, 8-07-IOT-V, & 9-07-IOT-V). This source*

c *Routine emission limits for this source account for off-gas from the heater treater & water flash drums and assist gas. This source may also combust gas from the facility's pressure*

d *Off-gas from this source is utilized in the facility blanket gas supply with any relief routed to the emergency LP control flare (EPN: 12-07-F) for combustion. For purposes of permitting,*

e *Designed to control non-routine emissions due to LP relief from the compressors during malfunctions.*

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-007 (2a-07-OST-CV)

B. Product(s) Stored: Produced Oil

C. Status: ☒ Operating ☐ Proposed ☐ Under Construction

D. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction: July 2007

2. Tank Data

A. Tank Specifications:

1.	Design capacity	210,000	gallons		
2.	True vapor pressure at storage temperature:	4.671	psia @	70.60	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	5.405	psia @	78.86	ºF
4.	Reid vapor pressure at storage temperature:	6.18	psia @	70.60	ºF
5.	Density of product at storage temperature:	N/A	lb/gal		
6.	Molecular weight of product vapor at storage temp.	50	lb/lbmol		

B. Tank Orientation: ☒ Vertical ☐ Horizontal

C. Type of Tank:

☒ Fixed Roof ☐ External Floating Roof ☐ Internal Floating Roof

☐ Pressure ☐ Variable Vapor Space ☐ Other: _____

D. Is the tank equipped with a Vapor Recovery System and/or flare? ☒ Yes ☐ No

If yes, describe below and include the efficiency of each.

Vapors from these sources are routed to the control flare (EPN: 11-07-F) for combustion with a combustion efficiency of 98%.

E. Closest City:

☒ Jackson, MS ☐ Meridian, MS ☐ Tupelo, MS ☐ Mobile, AL

☐ New Orleans, LA ☐ Memphis, TN ☐ Baton Rouge, LA

F. Is an E&P or similar report described in Condition 5.4(5) of the General Permit included for this tank in the Notice of Intent? ☒ Yes ☐ No

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

3. Horizontal Fixed Roof Tank

A. Shell Length: _____ feet
B. Shell Diameter: _____ feet
C. Working Volume: _____ gal
D. Maximum Throughput: _____ gal/yr
E. Is the tank heated? ☐ Yes ☐ No
F. Is the tank underground? ☐ Yes ☐ No
G. Shell Color/Shade:
☐ ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
H. Shell Condition: ☐ Good ☐ Poor

4. Vertical Fixed Roof Tank

A. Dimensions:
1. Shell Height: 24 feet
2. Shell Diameter: 38.7 feet
3. Maximum Liquid Height: 23 feet
4. Average Liquid Height: 11.5 feet
5. Working Volume: 210,000 gal
6. Turnovers per year: 227.22
7. Maximum throughput: 1,095,000 BBLs/yr
8. Is the tank heated? ☐ Yes ☒ No

B. Shell Characteristics:
1. Shell Color/Shade:
☐ White/White ☐ Aluminum/Specular ☒ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
2. Shell Condition: ☒ Good ☐ Poor

C. Roof Characteristics:
1. Roof Color/Shade:
☐ White/White ☐ Aluminum/Specular ☒ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
2. Roof Condition: ☒ Good ☐ Poor
3. Type: ☒ Cone ☐ Dome
4. Height: 1.21 feet

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

5. Internal Floating Roof Tank

A. Tank Characteristics:

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Number of Columns: _____
6. Self-Supporting Roof? ☐ Yes ☐ No
7. Effective Column Diameter:
   ☐ 9"x7" Built-up Column ☐ 8" Diameter Pipe ☐ Unknown
8. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining
9. External Shell Color/Shade:
   ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
10. External Shell Condition: ☐ Good ☐ Poor
11. Roof Color/Shade:
    ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
    ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
12. Roof Condition: ☐ Good ☐ Poor

B. Rim Seal System:

1. Primary Seal: ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted
2. Secondary Seal: ☐ Shoe-mounted ☐ Rim-mounted ☐ None

C. Deck Characteristics:

1. Deck Type: ☐ Bolted ☐ Welded
2. Deck Fitting Category: ☐ Typical ☐ Detail

6. External Floating Roof Tank

A. Tank Characteristics

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

6. External Floating Roof Tank (continued)

A. Tank Characteristics (continued):

6. Paint Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

7. Paint Condition: ☐ Good ☐ Poor

B. Roof Characteristics

1. Roof Type: ☐ Pontoon ☐ Double Deck

2. Roof Fitting Category: ☐ Typical ☐ Detail

C. Tank Construction and Rim-Seal System:

1. Tank Construction: ☐ Welded ☐ Riveted

2. Primary Seal:
☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted

3. Secondary Seal
☐ None ☐ Shoe-mounted ☐ Rim-mounted ☐ Weather shield

7. Pollutant Emissions

A. Fixed Roof Emissions:

Pollutant[1]	Working Loss (tons/yr)	Breathing Loss (tons/yr)	Total Emissions (tons/yr)
VOC	94.09*	5.47*	99.56*

**It should be noted that the emissions listed above represent the fixed roof emissions prior to emissions being routed to the control flare for combustion.*

B. Floating Roof Emissions:

Pollutant[1]	Rim Seal Loss (tons/yr)	Withdrawal Loss (tons/yr)	Deck Fitting Loss (tons/yr)	Deck Seam Loss (tons/yr)	Landing Loss[2] (tons/yr)	Total Emissions (tons/yr)

1. All regulated air pollutants including hazardous air pollutants emitted from this source should be listed in accordance with the OGP Application Instructions. A list of regulated air pollutants and a link to EPA's list of hazardous air pollutants is provided in the OGP Application Instructions.
2. Landing losses should be determined according to the procedures in *Organic Liquid Storage Tanks* chapter of EPA's AP-42 emission factors. If the roof is not landed at least once/yr, enter "NA".

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-009 (3-07-OST-V)

B. Product(s) Stored: Produced Oil

C. Status: ☒ Operating ☐ Proposed ☐ Under Construction

D. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction: July 2007

2. Tank Data

A. Tank Specifications:

1.	Design capacity	63,000	gallons		
2.	True vapor pressure at storage temperature:	4.635	psia @	70.17	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	5.365	psia @	78.43	ºF
4.	Reid vapor pressure at storage temperature:	6.18	psia @	70.17	ºF
5.	Density of product at storage temperature:	N/A	lb/gal		
6.	Molecular weight of product vapor at storage temp.	50	lb/lbmol		

B. Tank Orientation: ☒ Vertical ☐ Horizontal

C. Type of Tank:

☒ Fixed Roof ☐ External Floating Roof ☐ Internal Floating Roof

☐ Pressure ☐ Variable Vapor Space ☐ Other: _____

D. Is the tank equipped with a Vapor Recovery System and/or flare? ☒ Yes ☐ No

If yes, describe below and include the efficiency of each.

Vapors from these sources are routed to the control flare (EPN: 11-07-F) for combustion with a combustion efficiency of 98%.

E. Closest City:

☒ Jackson, MS ☐ Meridian, MS ☐ Tupelo, MS ☐ Mobile, AL

☐ New Orleans, LA ☐ Memphis, TN ☐ Baton Rouge, LA

F. Is an E&P or similar report described in Condition 5.4(5) of the General Permit included for this tank in the Notice of Intent? ☒ Yes ☐ No

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

3. Horizontal Fixed Roof Tank

A. Shell Length: _____ feet
B. Shell Diameter: _____ feet
C. Working Volume: _____ gal
D. Maximum Throughput: _____ gal/yr
E. Is the tank heated? ☐ Yes ☐ No
F. Is the tank underground? ☐ Yes ☐ No
G. Shell Color/Shade:
☐ ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
H. Shell Condition: ☐ Good ☐ Poor

4. Vertical Fixed Roof Tank

A. Dimensions:
1. Shell Height: 24 feet
2. Shell Diameter: 21.5 feet
3. Maximum Liquid Height: 23 feet
4. Average Liquid Height: 11.5 feet
5. Working Volume: 63,000 gal
6. Turnovers per year: 2.45
7. Maximum throughput: 3,650 BBLs/yr
8. Is the tank heated? ☐ Yes ☒ No

B. Shell Characteristics:
1. Shell Color/Shade:
☐ White/White ☐ Aluminum/Specular ☒ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
2. Shell Condition: ☒ Good ☐ Poor

C. Roof Characteristics:
1. Roof Color/Shade:
☐ White/White ☐ Aluminum/Specular ☒ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
2. Roof Condition: ☒ Good ☐ Poor
3. Type: ☒ Cone ☐ Dome
4. Height: 0.67 feet

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

5. Internal Floating Roof Tank

A. Tank Characteristics:

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Number of Columns: _____
6. Self-Supporting Roof? ☐ Yes ☐ No
7. Effective Column Diameter:
   ☐ 9"x7" Built-up Column ☐ 8" Diameter Pipe ☐ Unknown
8. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining
9. External Shell Color/Shade:
   ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
10. External Shell Condition: ☐ Good ☐ Poor
11. Roof Color/Shade:
    ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
    ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
12. Roof Condition: ☐ Good ☐ Poor

B. Rim Seal System:

1. Primary Seal: ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted
2. Secondary Seal: ☐ Shoe-mounted ☐ Rim-mounted ☐ None

C. Deck Characteristics:

1. Deck Type: ☐ Bolted ☐ Welded
2. Deck Fitting Category: ☐ Typical ☐ Detail

6. External Floating Roof Tank

A. Tank Characteristics

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

6. External Floating Roof Tank (continued)

A. Tank Characteristics (continued):

6. Paint Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

7. Paint Condition: ☐ Good ☐ Poor

B. Roof Characteristics

1. Roof Type: ☐ Pontoon ☐ Double Deck

2. Roof Fitting Category: ☐ Typical ☐ Detail

C. Tank Construction and Rim-Seal System:

1. Tank Construction: ☐ Welded ☐ Riveted

2. Primary Seal:
☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted

3. Secondary Seal
☐ None ☐ Shoe-mounted ☐ Rim-mounted ☐ Weather shield

7. Pollutant Emissions

A. Fixed Roof Emissions:

Pollutant[1]	Working Loss (tons/yr)	Breathing Loss (tons/yr)	Total Emissions (tons/yr)
VOC	0.31*	1.67*	1.98*

**It should be noted that the emissions listed above represent the fixed roof emissions prior to emissions being routed to the control flare for combustion.*

B. Floating Roof Emissions:

Pollutant[1]	Rim Seal Loss (tons/yr)	Withdrawal Loss (tons/yr)	Deck Fitting Loss (tons/yr)	Deck Seam Loss (tons/yr)	Landing Loss[2] (tons/yr)	Total Emissions (tons/yr)

1. All regulated air pollutants including hazardous air pollutants emitted from this source should be listed in accordance with the OGP Application Instructions. A list of regulated air pollutants and a link to EPA's list of hazardous air pollutants is provided in the OGP Application Instructions.
2. Landing losses should be determined according to the procedures in *Organic Liquid Storage Tanks* chapter of EPA's AP-42 emission factors. If the roof is not landed at least once/yr, enter "NA".

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-008 (4a-07-ST-CV)

B. Product(s) Stored: Produced Water & Oil

C. Status: ☒ Operating ☐ Proposed ☐ Under Construction

D. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction: July 2007

2. Tank Data

A. Tank Specifications:

1.	Design capacity	84,000	gallons		
2.	True vapor pressure at storage temperature:	0.367	psia @	69.97	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	0.483	psia @	78.23	ºF
4.	Reid vapor pressure at storage temperature:	6.18	psia @	69.97	ºF
5.	Density of product at storage temperature:	N/A	lb/gal		
6.	Molecular weight of product vapor at storage temp.	18.40	lb/lbmol		

B. Tank Orientation: ☒ Vertical ☐ Horizontal

C. Type of Tank:

☒ Fixed Roof ☐ External Floating Roof ☐ Internal Floating Roof

☐ Pressure ☐ Variable Vapor Space ☐ Other: _____

D. Is the tank equipped with a Vapor Recovery System and/or flare? ☐ Yes ☒ No

If yes, describe below and include the efficiency of each.

E. Closest City:

☒ Jackson, MS ☐ Meridian, MS ☐ Tupelo, MS ☐ Mobile, AL

☐ New Orleans, LA ☐ Memphis, TN ☐ Baton Rouge, LA

F. Is an E&P or similar report described in Condition 5.4(5) of the General Permit included for this tank in the Notice of Intent? ☒ Yes ☐ No

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

3. Horizontal Fixed Roof Tank

A. Shell Length: _____ feet
B. Shell Diameter: _____ feet
C. Working Volume: _____ gal
D. Maximum Throughput: _____ gal/yr
E. Is the tank heated? ☐ Yes ☐ No
F. Is the tank underground? ☐ Yes ☐ No
G. Shell Color/Shade:
☐ ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
H. Shell Condition: ☐ Good ☐ Poor

4. Vertical Fixed Roof Tank

A. Dimensions:
1. Shell Height: 32 feet
2. Shell Diameter: 21.5 feet
3. Maximum Liquid Height: 31 feet
4. Average Liquid Height: 15.5 feet
5. Working Volume: 84,000 gal
6. Turnovers per year: 1,822.51
7. Maximum throughput: 3,653,650 BBLs/yr
8. Is the tank heated? ☐ Yes ☒ No

B. Shell Characteristics:
1. Shell Color/Shade:
☐ White/White ☐ Aluminum/Specular ☒ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
2. Shell Condition: ☒ Good ☐ Poor

C. Roof Characteristics:
1. Roof Color/Shade:
☐ White/White ☐ Aluminum/Specular ☒ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
2. Roof Condition: ☒ Good ☐ Poor
3. Type: ☒ Cone ☐ Dome
4. Height: 0.67 feet

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

5. Internal Floating Roof Tank

A. Tank Characteristics:

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Number of Columns: _____
6. Self-Supporting Roof? ☐ Yes ☐ No
7. Effective Column Diameter:
   ☐ 9"x7" Built-up Column ☐ 8" Diameter Pipe ☐ Unknown
8. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining
9. External Shell Color/Shade:
   ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
10. External Shell Condition: ☐ Good ☐ Poor
11. Roof Color/Shade:
    ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
    ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
12. Roof Condition: ☐ Good ☐ Poor

B. Rim Seal System:

1. Primary Seal: ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted
2. Secondary Seal: ☐ Shoe-mounted ☐ Rim-mounted ☐ None

C. Deck Characteristics:

1. Deck Type: ☐ Bolted ☐ Welded
2. Deck Fitting Category: ☐ Typical ☐ Detail

6. External Floating Roof Tank

A. Tank Characteristics

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

6. External Floating Roof Tank (continued)

A. Tank Characteristics (continued):

6. Paint Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

7. Paint Condition: ☐ Good ☐ Poor

B. Roof Characteristics

1. Roof Type: ☐ Pontoon ☐ Double Deck

2. Roof Fitting Category: ☐ Typical ☐ Detail

C. Tank Construction and Rim-Seal System:

1. Tank Construction: ☐ Welded ☐ Riveted

2. Primary Seal:
☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted

3. Secondary Seal
☐ None ☐ Shoe-mounted ☐ Rim-mounted ☐ Weather shield

7. Pollutant Emissions

A. Fixed Roof Emissions:

Pollutant[1]	Working Loss (tons/yr)	Breathing Loss (tons/yr)	Total Emissions (tons/yr)
VOC	9.10	0.08	9.18

B. Floating Roof Emissions:

Pollutant[1]	Rim Seal Loss (tons/yr)	Withdrawal Loss (tons/yr)	Deck Fitting Loss (tons/yr)	Deck Seam Loss (tons/yr)	Landing Loss[2] (tons/yr)	Total Emissions (tons/yr)

1. All regulated air pollutants including hazardous air pollutants emitted from this source should be listed in accordance with the OGP Application Instructions. A list of regulated air pollutants and a link to EPA's list of hazardous air pollutants is provided in the OGP Application Instructions.
2. Landing losses should be determined according to the procedures in *Organic Liquid Storage Tanks* chapter of EPA's AP-42 emission factors. If the roof is not landed at least once/yr, enter "NA".

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-010 (5a-07-WST-CV)

B. Product(s) Stored: Produced Water

C. Status: ☒ Operating ☐ Proposed ☐ Under Construction

D. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction: July 2007

2. Tank Data

A. Tank Specifications:

1.	Design capacity	210,000	gallons		
2.	True vapor pressure at storage temperature:	0.371	psia @	70.60	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	0.489	psia @	78.86	ºF
4.	Reid vapor pressure at storage temperature:	0.371	psia @	70.60	ºF
5.	Density of product at storage temperature:	N/A	lb/gal		
6.	Molecular weight of product vapor at storage temp.	18.02	lb/lbmol		

B. Tank Orientation: ☒ Vertical ☐ Horizontal

C. Type of Tank:

☒ Fixed Roof ☐ External Floating Roof ☐ Internal Floating Roof

☐ Pressure ☐ Variable Vapor Space ☐ Other: _____

D. Is the tank equipped with a Vapor Recovery System and/or flare? ☐ Yes ☒ No

If yes, describe below and include the efficiency of each.

E. Closest City:

☒ Jackson, MS ☐ Meridian, MS ☐ Tupelo, MS ☐ Mobile, AL

☐ New Orleans, LA ☐ Memphis, TN ☐ Baton Rouge, LA

F. Is an E&P or similar report described in Condition 5.4(5) of the General Permit included for this tank in the Notice of Intent? ☒ Yes ☐ No

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

3. Horizontal Fixed Roof Tank

A. Shell Length: _____ feet
B. Shell Diameter: _____ feet
C. Working Volume: _____ gal
D. Maximum Throughput: _____ gal/yr
E. Is the tank heated? ☐ Yes ☐ No
F. Is the tank underground? ☐ Yes ☐ No
G. Shell Color/Shade:
☐ ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
H. Shell Condition: ☐ Good ☐ Poor

4. Vertical Fixed Roof Tank

A. Dimensions:
1. Shell Height: 24 feet
2. Shell Diameter: 38.7 feet
3. Maximum Liquid Height: 23 feet
4. Average Liquid Height: 11.5 feet
5. Working Volume: 210,000 gal
6. Turnovers per year: 757.4
7. Maximum throughput: 3,650,000 BBLs/yr
8. Is the tank heated? ☐ Yes ☒ No

B. Shell Characteristics:
1. Shell Color/Shade:
☐ White/White ☐ Aluminum/Specular ☒ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
2. Shell Condition: ☒ Good ☐ Poor

C. Roof Characteristics:
1. Roof Color/Shade:
☐ White/White ☐ Aluminum/Specular ☒ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
2. Roof Condition: ☒ Good ☐ Poor
3. Type: ☒ Cone ☐ Dome
4. Height: 1.21 feet

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

5. Internal Floating Roof Tank

A. Tank Characteristics:

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Number of Columns: _____
6. Self-Supporting Roof? ☐ Yes ☐ No
7. Effective Column Diameter:
   ☐ 9"x7" Built-up Column ☐ 8" Diameter Pipe ☐ Unknown
8. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining
9. External Shell Color/Shade:
   ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
10. External Shell Condition: ☐ Good ☐ Poor
11. Roof Color/Shade:
    ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
    ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
12. Roof Condition: ☐ Good ☐ Poor

B. Rim Seal System:

1. Primary Seal: ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted
2. Secondary Seal: ☐ Shoe-mounted ☐ Rim-mounted ☐ None

C. Deck Characteristics:

1. Deck Type: ☐ Bolted ☐ Welded
2. Deck Fitting Category: ☐ Typical ☐ Detail

6. External Floating Roof Tank

A. Tank Characteristics

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

6. External Floating Roof Tank (continued)

A. Tank Characteristics (continued):

6. Paint Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

7. Paint Condition: ☐ Good ☐ Poor

B. Roof Characteristics

1. Roof Type: ☐ Pontoon ☐ Double Deck

2. Roof Fitting Category: ☐ Typical ☐ Detail

C. Tank Construction and Rim-Seal System:

1. Tank Construction: ☐ Welded ☐ Riveted

2. Primary Seal:
☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted

3. Secondary Seal
☐ None ☐ Shoe-mounted ☐ Rim-mounted ☐ Weather shield

7. Pollutant Emissions

A. Fixed Roof Emissions:

Pollutant[1]	Working Loss (tons/yr)	Breathing Loss (tons/yr)	Total Emissions (tons/yr)
VOC	1.85	0.20	2.05

B. Floating Roof Emissions:

Pollutant[1]	Rim Seal Loss (tons/yr)	Withdrawal Loss (tons/yr)	Deck Fitting Loss (tons/yr)	Deck Seam Loss (tons/yr)	Landing Loss[2] (tons/yr)	Total Emissions (tons/yr)

1. All regulated air pollutants including hazardous air pollutants emitted from this source should be listed in accordance with the OGP Application Instructions. A list of regulated air pollutants and a link to EPA's list of hazardous air pollutants is provided in the OGP Application Instructions.
2. Landing losses should be determined according to the procedures in *Organic Liquid Storage Tanks* chapter of EPA's AP-42 emission factors. If the roof is not landed at least once/yr, enter "NA".

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-014 (6-07-SEP-V)

B. Product(s) Stored: Produced Oil

C. Status: ☒ Operating ☐ Proposed ☐ Under Construction

D. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction: July 2007

2. Tank Data

A. Tank Specifications:

1.	Design capacity	48,000	gallons		
2.	True vapor pressure at storage temperature:	4.629	psia @	70.10	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	5.406	psia @	78.87	ºF
4.	Reid vapor pressure at storage temperature:	6.18	psia @	70.10	ºF
5.	Density of product at storage temperature:	N/A	lb/gal		
6.	Molecular weight of product vapor at storage temp.	50	lb/lbmol		

B. Tank Orientation: ☐ Vertical ☒ Horizontal

C. Type of Tank:

☒ Fixed Roof ☐ External Floating Roof ☐ Internal Floating Roof

☐ Pressure ☐ Variable Vapor Space ☐ Other: _____

D. Is the tank equipped with a Vapor Recovery System and/or flare? ☐ Yes ☒ No

If yes, describe below and include the efficiency of each.

E. Closest City:

☒ Jackson, MS ☐ Meridian, MS ☐ Tupelo, MS ☐ Mobile, AL

☐ New Orleans, LA ☐ Memphis, TN ☐ Baton Rouge, LA

F. Is an E&P or similar report described in Condition 5.4(5) of the General Permit included for this tank in the Notice of Intent? ☒ Yes ☐ No

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary — Section OPGP-E

3. Horizontal Fixed Roof Tank

A. Shell Length: 40 feet
B. Shell Diameter: 14.27 feet
C. Working Volume: 47,872 gal
D. Maximum Throughput: 306,600 gal/yr
E. Is the tank heated? ☐ Yes ☒ No
F. Is the tank underground? ☐ Yes ☒ No
G. Shell Color/Shade:

☐ ☐ Aluminum/Specular ☐ Aluminum/Diffuse

☐ Gray/Light ☒ Gray/Medium ☐ Red/Primer

H. Shell Condition: ☒ Good ☐ Poor

4. Vertical Fixed Roof Tank

A. Dimensions:
1. Shell Height: _____ feet
2. Shell Diameter: _____ feet
3. Maximum Liquid Height: _____ feet
4. Average Liquid Height: _____ feet
5. Working Volume: _____ gal
6. Turnovers per year: _____
7. Maximum throughput: _____ BBLs/yr
8. Is the tank heated? ☐ Yes ☐ No

B. Shell Characteristics:
1. Shell Color/Shade:

☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse

☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

2. Shell Condition: ☐ Good ☐ Poor

C. Roof Characteristics:
1. Roof Color/Shade:

☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse

☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

2. Roof Condition: ☐ Good ☐ Poor

3. Type: ☐ Cone ☐ Dome

4. Height: _____ feet

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

5. Internal Floating Roof Tank

A. Tank Characteristics:

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Number of Columns: _____
6. Self-Supporting Roof? ☐ Yes ☐ No
7. Effective Column Diameter:
   ☐ 9"x7" Built-up Column ☐ 8" Diameter Pipe ☐ Unknown
8. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining
9. External Shell Color/Shade:
   ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
10. External Shell Condition: ☐ Good ☐ Poor
11. Roof Color/Shade:
    ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
    ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
12. Roof Condition: ☐ Good ☐ Poor

B. Rim Seal System:

1. Primary Seal: ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted
2. Secondary Seal: ☐ Shoe-mounted ☐ Rim-mounted ☐ None

C. Deck Characteristics:

1. Deck Type: ☐ Bolted ☐ Welded
2. Deck Fitting Category: ☐ Typical ☐ Detail

6. External Floating Roof Tank

A. Tank Characteristics

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

6. External Floating Roof Tank (continued)

A. Tank Characteristics (continued):

6. Paint Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

7. Paint Condition: ☐ Good ☐ Poor

B. Roof Characteristics

1. Roof Type: ☐ Pontoon ☐ Double Deck

2. Roof Fitting Category: ☐ Typical ☐ Detail

C. Tank Construction and Rim-Seal System:

1. Tank Construction: ☐ Welded ☐ Riveted

2. Primary Seal:
☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted

3. Secondary Seal
☐ None ☐ Shoe-mounted ☐ Rim-mounted ☐ Weather shield

7. Pollutant Emissions

A. Fixed Roof Emissions:

Pollutant[1]	Working Loss (tons/yr)	Breathing Loss (tons/yr)	Total Emissions (tons/yr)
VOC	0.62	2.13	2.75

B. Floating Roof Emissions:

Pollutant[1]	Rim Seal Loss (tons/yr)	Withdrawal Loss (tons/yr)	Deck Fitting Loss (tons/yr)	Deck Seam Loss (tons/yr)	Landing Loss[2] (tons/yr)	Total Emissions (tons/yr)

1. All regulated air pollutants including hazardous air pollutants emitted from this source should be listed in accordance with the OGP Application Instructions. A list of regulated air pollutants and a link to EPA's list of hazardous air pollutants is provided in the OGP Application Instructions.
2. Landing losses should be determined according to the procedures in *Organic Liquid Storage Tanks* chapter of EPA's AP-42 emission factors. If the roof is not landed at least once/yr, enter "NA".

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-012 (7a-07-OST-CV)

B. Product(s) Stored: Produced Oil

C. Status: ☒ Operating ☐ Proposed ☐ Under Construction

D. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction: July 2007

2. Tank Data

A. Tank Specifications:

1.	Design capacity	16,800	gallons		
2.	True vapor pressure at storage temperature:	4.612	psia @	69.89	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	5.339	psia @	78.16	ºF
4.	Reid vapor pressure at storage temperature:	6.18	psia @	69.89	ºF
5.	Density of product at storage temperature:	N/A	lb/gal		
6.	Molecular weight of product vapor at storage temp.	50	lb/lbmol		

B. Tank Orientation: ☒ Vertical ☐ Horizontal

C. Type of Tank:

☒ Fixed Roof ☐ External Floating Roof ☐ Internal Floating Roof

☐ Pressure ☐ Variable Vapor Space ☐ Other: _____

D. Is the tank equipped with a Vapor Recovery System and/or flare? ☒ Yes ☐ No

If yes, describe below and include the efficiency of each.

Vapors from these sources are routed to the control flare (EPN: 11-07-F) for combustion with a combustion efficiency of 98%.

E. Closest City:

☒ Jackson, MS ☐ Meridian, MS ☐ Tupelo, MS ☐ Mobile, AL

☐ New Orleans, LA ☐ Memphis, TN ☐ Baton Rouge, LA

F. Is an E&P or similar report described in Condition 5.4(5) of the General Permit included for this tank in the Notice of Intent? ☒ Yes ☐ No

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

3. Horizontal Fixed Roof Tank

A. Shell Length: _____ feet
B. Shell Diameter: _____ feet
C. Working Volume: _____ gal
D. Maximum Throughput: _____ gal/yr
E. Is the tank heated? ☐ Yes ☐ No
F. Is the tank underground? ☐ Yes ☐ No
G. Shell Color/Shade:
☐ ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
H. Shell Condition: ☐ Good ☐ Poor

4. Vertical Fixed Roof Tank

A. Dimensions:
1. Shell Height: 20 feet
2. Shell Diameter: 12 feet
3. Maximum Liquid Height: 19 feet
4. Average Liquid Height: 9.5 feet
5. Working Volume: 16,800 gal
6. Turnovers per year: 19.07
7. Maximum throughput: 7,300 BBLs/yr
8. Is the tank heated? ☐ Yes ☒ No

B. Shell Characteristics:
1. Shell Color/Shade:
☐ White/White ☐ Aluminum/Specular ☒ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
2. Shell Condition: ☒ Good ☐ Poor

C. Roof Characteristics:
1. Roof Color/Shade:
☐ White/White ☐ Aluminum/Specular ☒ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
2. Roof Condition: ☒ Good ☐ Poor
3. Type: ☒ Cone ☐ Dome
4. Height: 0.38 feet

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

5. Internal Floating Roof Tank

A. Tank Characteristics:

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Number of Columns: _____
6. Self-Supporting Roof? ☐ Yes ☐ No
7. Effective Column Diameter:
   ☐ 9"x7" Built-up Column ☐ 8" Diameter Pipe ☐ Unknown
8. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining
9. External Shell Color/Shade:
   ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
10. External Shell Condition: ☐ Good ☐ Poor
11. Roof Color/Shade:
    ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
    ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
12. Roof Condition: ☐ Good ☐ Poor

B. Rim Seal System:

1. Primary Seal: ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted
2. Secondary Seal: ☐ Shoe-mounted ☐ Rim-mounted ☐ None

C. Deck Characteristics:

1. Deck Type: ☐ Bolted ☐ Welded
2. Deck Fitting Category: ☐ Typical ☐ Detail

6. External Floating Roof Tank

A. Tank Characteristics

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

6. External Floating Roof Tank (continued)

A. Tank Characteristics (continued):

6. Paint Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

7. Paint Condition: ☐ Good ☐ Poor

B. Roof Characteristics

1. Roof Type: ☐ Pontoon ☐ Double Deck

2. Roof Fitting Category: ☐ Typical ☐ Detail

C. Tank Construction and Rim-Seal System:

1. Tank Construction: ☐ Welded ☐ Riveted

2. Primary Seal:
☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted

3. Secondary Seal
☐ None ☐ Shoe-mounted ☐ Rim-mounted ☐ Weather shield

7. Pollutant Emissions

A. Fixed Roof Emissions:

Pollutant[1]	Working Loss (tons/yr)	Breathing Loss (tons/yr)	Total Emissions (tons/yr)
VOC	0.62*	0.50*	1.12*

**It should be noted that the emissions listed above represent the fixed roof emissions prior to emissions being routed to the control flare for combustion.*

B. Floating Roof Emissions:

Pollutant[1]	Rim Seal Loss (tons/yr)	Withdrawal Loss (tons/yr)	Deck Fitting Loss (tons/yr)	Deck Seam Loss (tons/yr)	Landing Loss[2] (tons/yr)	Total Emissions (tons/yr)

1. All regulated air pollutants including hazardous air pollutants emitted from this source should be listed in accordance with the OGP Application Instructions. A list of regulated air pollutants and a link to EPA's list of hazardous air pollutants is provided in the OGP Application Instructions.
2. Landing losses should be determined according to the procedures in *Organic Liquid Storage Tanks* chapter of EPA's AP-42 emission factors. If the roof is not landed at least once/yr, enter "NA".

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-013 (7b-07-WST-CV)

B. Product(s) Stored: Produced Water

C. Status: ☒ Operating ☐ Proposed ☐ Under Construction

D. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction: July 2007

2. Tank Data

A. Tank Specifications:

1.	Design capacity	16,800	gallons		
2.	True vapor pressure at storage temperature:	0.362	psia @	69.89	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	0.477	psia @	78.16	ºF
4.	Reid vapor pressure at storage temperature:	0.362	psia @	69.89	ºF
5.	Density of product at storage temperature:	N/A	lb/gal		
6.	Molecular weight of product vapor at storage temp.	18.02	lb/lbmol		

B. Tank Orientation: ☒ Vertical ☐ Horizontal

C. Type of Tank:

☒ Fixed Roof ☐ External Floating Roof ☐ Internal Floating Roof

☐ Pressure ☐ Variable Vapor Space ☐ Other: _____

D. Is the tank equipped with a Vapor Recovery System and/or flare? ☐ Yes ☒ No

If yes, describe below and include the efficiency of each.

E. Closest City:

☒ Jackson, MS ☐ Meridian, MS ☐ Tupelo, MS ☐ Mobile, AL

☐ New Orleans, LA ☐ Memphis, TN ☐ Baton Rouge, LA

F. Is an E&P or similar report described in Condition 5.4(5) of the General Permit included for this tank in the Notice of Intent? ☒ Yes ☐ No

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

3. Horizontal Fixed Roof Tank

A. Shell Length: _____ feet
B. Shell Diameter: _____ feet
C. Working Volume: _____ gal
D. Maximum Throughput: _____ gal/yr
E. Is the tank heated? ☐ Yes ☐ No
F. Is the tank underground? ☐ Yes ☐ No
G. Shell Color/Shade:
☐ ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
H. Shell Condition: ☐ Good ☐ Poor

4. Vertical Fixed Roof Tank

A. Dimensions:
1. Shell Height: 20 feet
2. Shell Diameter: 12 feet
3. Maximum Liquid Height: 19 feet
4. Average Liquid Height: 9.5 feet
5. Working Volume: 16,800 gal
6. Turnovers per year: 381.43
7. Maximum throughput: 146,000 BBLs/yr
8. Is the tank heated? ☐ Yes ☒ No

B. Shell Characteristics:
1. Shell Color/Shade:
☐ White/White ☐ Aluminum/Specular ☒ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
2. Shell Condition: ☒ Good ☐ Poor

C. Roof Characteristics:
1. Roof Color/Shade:
☐ White/White ☐ Aluminum/Specular ☒ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
2. Roof Condition: ☒ Good ☐ Poor
3. Type: ☒ Cone ☐ Dome
4. Height: 0.38 feet

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

5. Internal Floating Roof Tank

A. Tank Characteristics:

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Number of Columns: _____
6. Self-Supporting Roof? ☐ Yes ☐ No
7. Effective Column Diameter:
   ☐ 9"x7" Built-up Column ☐ 8" Diameter Pipe ☐ Unknown
8. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining
9. External Shell Color/Shade:
   ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
10. External Shell Condition: ☐ Good ☐ Poor
11. Roof Color/Shade:
    ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
    ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
12. Roof Condition: ☐ Good ☐ Poor

B. Rim Seal System:

1. Primary Seal: ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted
2. Secondary Seal: ☐ Shoe-mounted ☐ Rim-mounted ☐ None

C. Deck Characteristics:

1. Deck Type: ☐ Bolted ☐ Welded
2. Deck Fitting Category: ☐ Typical ☐ Detail

6. External Floating Roof Tank

A. Tank Characteristics

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining

Tank Summary — Section OPGP-E

6. External Floating Roof Tank (continued)

A. Tank Characteristics (continued):

6. Paint Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

7. Paint Condition: ☐ Good ☐ Poor

B. Roof Characteristics

1. Roof Type: ☐ Pontoon ☐ Double Deck

2. Roof Fitting Category: ☐ Typical ☐ Detail

C. Tank Construction and Rim-Seal System:

1. Tank Construction: ☐ Welded ☐ Riveted

2. Primary Seal:
☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted

3. Secondary Seal
☐ None ☐ Shoe-mounted ☐ Rim-mounted ☐ Weather shield

7. Pollutant Emissions

A. Fixed Roof Emissions:

Pollutant[1]	Working Loss (tons/yr)	Breathing Loss (tons/yr)	Total Emissions (tons/yr)
VOC	0.08	0.02	0.10

B. Floating Roof Emissions:

Pollutant[1]	Rim Seal Loss (tons/yr)	Withdrawal Loss (tons/yr)	Deck Fitting Loss (tons/yr)	Deck Seam Loss (tons/yr)	Landing Loss[2] (tons/yr)	Total Emissions (tons/yr)

1. All regulated air pollutants including hazardous air pollutants emitted from this source should be listed in accordance with the OGP Application Instructions. A list of regulated air pollutants and a link to EPA's list of hazardous air pollutants is provided in the OGP Application Instructions.
2. Landing losses should be determined according to the procedures in *Organic Liquid Storage Tanks* chapter of EPA's AP-42 emission factors. If the roof is not landed at least once/yr, enter "NA".

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-015 & AA-016 (8-07-IOT-V & 9-07-IOT-V)

B. Product(s) Stored: Produced Oil, Corrosion Inhibitor, Paraffin Inhibitor, Asphaltine Inhibitor

C. Status: ☒ Operating ☐ Proposed ☐ Under Construction

D. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction: July 2007

2. Tank Data

A. Tank Specifications:

1.	Design capacity	63,000	gallons		
2.	True vapor pressure at storage temperature:	4.635	psia @	70.17	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	5.365	psia @	78.43	ºF
4.	Reid vapor pressure at storage temperature:	6.18	psia @	70.17	ºF
5.	Density of product at storage temperature:	N/A	lb/gal		
6.	Molecular weight of product vapor at storage temp.	50	lb/lbmol		

B. Tank Orientation: ☒ Vertical ☐ Horizontal

C. Type of Tank:

☒ Fixed Roof ☐ External Floating Roof ☐ Internal Floating Roof

☐ Pressure ☐ Variable Vapor Space ☐ Other: _____

D. Is the tank equipped with a Vapor Recovery System and/or flare? ☒ Yes ☐ No

If yes, describe below and include the efficiency of each.

Vapors from these sources are routed to the control flare (EPN: 11-07-F) for combustion with a combustion efficiency of 98%.

E. Closest City:

☒ Jackson, MS ☐ Meridian, MS ☐ Tupelo, MS ☐ Mobile, AL

☐ New Orleans, LA ☐ Memphis, TN ☐ Baton Rouge, LA

F. Is an E&P or similar report described in Condition 5.4(5) of the General Permit included for this tank in the Notice of Intent? ☒ Yes ☐ No

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

3. Horizontal Fixed Roof Tank

A. Shell Length: _____ feet
B. Shell Diameter: _____ feet
C. Working Volume: _____ gal
D. Maximum Throughput: _____ gal/yr
E. Is the tank heated? ☐ Yes ☐ No
F. Is the tank underground? ☐ Yes ☐ No
G. Shell Color/Shade:
☐ ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
H. Shell Condition: ☐ Good ☐ Poor

4. Vertical Fixed Roof Tank

A. Dimensions:
1. Shell Height: 24 feet
2. Shell Diameter: 21.5 feet
3. Maximum Liquid Height: 23 feet
4. Average Liquid Height: 11.5 feet
5. Working Volume: 63,000 gal
6. Turnovers per year: 30.67
7. Maximum throughput: 45,625 BBLs/yr
8. Is the tank heated? ☐ Yes ☒ No

B. Shell Characteristics:
1. Shell Color/Shade:
☐ White/White ☐ Aluminum/Specular ☒ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
2. Shell Condition: ☒ Good ☐ Poor

C. Roof Characteristics:
1. Roof Color/Shade:
☐ White/White ☐ Aluminum/Specular ☒ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
2. Roof Condition: ☒ Good ☐ Poor
3. Type: ☒ Cone ☐ Dome
4. Height: 0.67 feet

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

5. Internal Floating Roof Tank

A. Tank Characteristics:

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Number of Columns: _____
6. Self-Supporting Roof? ☐ Yes ☐ No
7. Effective Column Diameter:
   ☐ 9"x7" Built-up Column ☐ 8" Diameter Pipe ☐ Unknown
8. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining
9. External Shell Color/Shade:
   ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
10. External Shell Condition: ☐ Good ☐ Poor
11. Roof Color/Shade:
    ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
    ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
12. Roof Condition: ☐ Good ☐ Poor

B. Rim Seal System:

1. Primary Seal: ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted
2. Secondary Seal: ☐ Shoe-mounted ☐ Rim-mounted ☐ None

C. Deck Characteristics:

1. Deck Type: ☐ Bolted ☐ Welded
2. Deck Fitting Category: ☐ Typical ☐ Detail

6. External Floating Roof Tank

A. Tank Characteristics

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining

6. External Floating Roof Tank (continued)

A. Tank Characteristics (continued):

6. Paint Color/Shade:

☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse

☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

7. Paint Condition: ☐ Good ☐ Poor

B. Roof Characteristics

1. Roof Type: ☐ Pontoon ☐ Double Deck

2. Roof Fitting Category: ☐ Typical ☐ Detail

C. Tank Construction and Rim-Seal System:

1. Tank Construction: ☐ Welded ☐ Riveted

2. Primary Seal:

☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted

3. Secondary Seal

☐ None ☐ Shoe-mounted ☐ Rim-mounted ☐ Weather shield

7. Pollutant Emissions

A. Fixed Roof Emissions:

Pollutant[1]	Working Loss (tons/yr)	Breathing Loss (tons/yr)	Total Emissions (tons/yr)
VOC	3.90*	1.67*	5.57*

**It should be noted that the emissions listed above represent the fixed roof emissions prior to emissions being routed to the control flare for combustion.*

B. Floating Roof Emissions:

Pollutant[1]	Rim Seal Loss (tons/yr)	Withdrawal Loss (tons/yr)	Deck Fitting Loss (tons/yr)	Deck Seam Loss (tons/yr)	Landing Loss[2] (tons/yr)	Total Emissions (tons/yr)

1. All regulated air pollutants including hazardous air pollutants emitted from this source should be listed in accordance with the OGP Application Instructions. A list of regulated air pollutants and a link to EPA's list of hazardous air pollutants is provided in the OGP Application Instructions.
2. Landing losses should be determined according to the procedures in *Organic Liquid Storage Tanks* chapter of EPA's AP-42 emission factors. If the roof is not landed at least once/yr, enter "NA".

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-017 (13-07-CST)

B. Product(s) Stored: Organic Chemical Blend (assumes 100% N-Hexane as worst case)

C. Status: ☒ Operating ☐ Proposed ☐ Under Construction

D. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction: July 2007

2. Tank Data

A. Tank Specifications:

1.	Design capacity	500	gallons		
2.	True vapor pressure at storage temperature:	2.606	psia @	72.24	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	3.326	psia @	82.37	ºF
4.	Reid vapor pressure at storage temperature:	2.606	psia @	72.24	ºF
5.	Density of product at storage temperature:	N/A	lb/gal		
6.	Molecular weight of product vapor at storage temp.	86.18	lb/lbmol		

B. Tank Orientation: ☐ Vertical ☒ Horizontal

C. Type of Tank:

☒ Fixed Roof ☐ External Floating Roof ☐ Internal Floating Roof

☐ Pressure ☐ Variable Vapor Space ☐ Other: _____

D. Is the tank equipped with a Vapor Recovery System and/or flare? ☐ Yes ☒ No

If yes, describe below and include the efficiency of each.

E. Closest City:

☒ Jackson, MS ☐ Meridian, MS ☐ Tupelo, MS ☐ Mobile, AL

☐ New Orleans, LA ☐ Memphis, TN ☐ Baton Rouge, LA

F. Is an E&P or similar report described in Condition 5.4(5) of the General Permit included for this tank in the Notice of Intent? ☒ Yes ☐ No

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

3. Horizontal Fixed Roof Tank

A. Shell Length: 5 feet
B. Shell Diameter: 4 feet
C. Working Volume: 500 gal
D. Maximum Throughput: 1,500 gal/yr
E. Is the tank heated? ☐ Yes ☒ No
F. Is the tank underground? ☐ Yes ☒ No
G. Shell Color/Shade:

☐ ☐ Aluminum/Specular ☐ Aluminum/Diffuse

☐ Gray/Light ☐ Gray/Medium ☒ Red/Primer

H. Shell Condition: ☒ Good ☐ Poor

4. Vertical Fixed Roof Tank

A. Dimensions:
1. Shell Height: _____ feet
2. Shell Diameter: _____ feet
3. Maximum Liquid Height: _____ feet
4. Average Liquid Height: _____ feet
5. Working Volume: _____ gal
6. Turnovers per year: _____
7. Maximum throughput: _____ BBLs/yr
8. Is the tank heated? ☐ Yes ☐ No

B. Shell Characteristics:
1. Shell Color/Shade:

☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse

☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

2. Shell Condition: ☐ Good ☐ Poor

C. Roof Characteristics:
1. Roof Color/Shade:

☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse

☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

2. Roof Condition: ☐ Good ☐ Poor

3. Type: ☐ Cone ☐ Dome

4. Height: _____ feet

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

5. Internal Floating Roof Tank

A. Tank Characteristics:

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Number of Columns: _____
6. Self-Supporting Roof? ☐ Yes ☐ No
7. Effective Column Diameter:
   ☐ 9"x7" Built-up Column ☐ 8" Diameter Pipe ☐ Unknown
8. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining
9. External Shell Color/Shade:
   ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
10. External Shell Condition: ☐ Good ☐ Poor
11. Roof Color/Shade:
    ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
    ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
12. Roof Condition: ☐ Good ☐ Poor

B. Rim Seal System:

1. Primary Seal: ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted
2. Secondary Seal: ☐ Shoe-mounted ☐ Rim-mounted ☐ None

C. Deck Characteristics:

1. Deck Type: ☐ Bolted ☐ Welded
2. Deck Fitting Category: ☐ Typical ☐ Detail

6. External Floating Roof Tank

A. Tank Characteristics

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

6. External Floating Roof Tank (continued)

A. Tank Characteristics (continued):

6. Paint Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

7. Paint Condition: ☐ Good ☐ Poor

B. Roof Characteristics

1. Roof Type: ☐ Pontoon ☐ Double Deck

2. Roof Fitting Category: ☐ Typical ☐ Detail

C. Tank Construction and Rim-Seal System:

1. Tank Construction: ☐ Welded ☐ Riveted

2. Primary Seal:
☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted

3. Secondary Seal
☐ None ☐ Shoe-mounted ☐ Rim-mounted ☐ Weather shield

7. Pollutant Emissions

A. Fixed Roof Emissions:

Pollutant[1]	Working Loss (tons/yr)	Breathing Loss (tons/yr)	Total Emissions (tons/yr)
VOC	0.01	0.03	0.04

B. Floating Roof Emissions:

Pollutant[1]	Rim Seal Loss (tons/yr)	Withdrawal Loss (tons/yr)	Deck Fitting Loss (tons/yr)	Deck Seam Loss (tons/yr)	Landing Loss[2] (tons/yr)	Total Emissions (tons/yr)

1. All regulated air pollutants including hazardous air pollutants emitted from this source should be listed in accordance with the OGP Application Instructions. A list of regulated air pollutants and a link to EPA's list of hazardous air pollutants is provided in the OGP Application Instructions.
2. Landing losses should be determined according to the procedures in *Organic Liquid Storage Tanks* chapter of EPA's AP-42 emission factors. If the roof is not landed at least once/yr, enter "NA".

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-018 (14-07-CST)

B. Product(s) Stored: Organic Chemical Blend (assumes 100% N-Hexane as worst case)

C. Status: ☒ Operating ☐ Proposed ☐ Under Construction

D. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction: July 2007

2. Tank Data

A. Tank Specifications:

1.	Design capacity	500	gallons		
2.	True vapor pressure at storage temperature:	2.606	psia @	72.24	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	3.326	psia @	82.37	ºF
4.	Reid vapor pressure at storage temperature:	2.606	psia @	72.24	ºF
5.	Density of product at storage temperature:	N/A	lb/gal		
6.	Molecular weight of product vapor at storage temp.	86.18	lb/lbmol		

B. Tank Orientation: ☐ Vertical ☒ Horizontal

C. Type of Tank:

☒ Fixed Roof ☐ External Floating Roof ☐ Internal Floating Roof

☐ Pressure ☐ Variable Vapor Space ☐ Other: _____

D. Is the tank equipped with a Vapor Recovery System and/or flare? ☐ Yes ☒ No

If yes, describe below and include the efficiency of each.

E. Closest City:

☒ Jackson, MS ☐ Meridian, MS ☐ Tupelo, MS ☐ Mobile, AL

☐ New Orleans, LA ☐ Memphis, TN ☐ Baton Rouge, LA

F. Is an E&P or similar report described in Condition 5.4(5) of the General Permit included for this tank in the Notice of Intent? ☒ Yes ☐ No

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

3. Horizontal Fixed Roof Tank

A. Shell Length: 5 feet
B. Shell Diameter: 4 feet
C. Working Volume: 500 gal
D. Maximum Throughput: 2,000 gal/yr
E. Is the tank heated? ☐ Yes ☒ No
F. Is the tank underground? ☐ Yes ☒ No
G. Shell Color/Shade:

☐ ☐ Aluminum/Specular ☐ Aluminum/Diffuse

☐ Gray/Light ☐ Gray/Medium ☒ Red/Primer

H. Shell Condition: ☒ Good ☐ Poor

4. Vertical Fixed Roof Tank

A. Dimensions:
1. Shell Height: _____ feet
2. Shell Diameter: _____ feet
3. Maximum Liquid Height: _____ feet
4. Average Liquid Height: _____ feet
5. Working Volume: _____ gal
6. Turnovers per year: _____
7. Maximum throughput: _____ BBLs/yr
8. Is the tank heated? ☐ Yes ☐ No

B. Shell Characteristics:
1. Shell Color/Shade:

☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse

☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

2. Shell Condition: ☐ Good ☐ Poor

C. Roof Characteristics:
1. Roof Color/Shade:

☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse

☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

2. Roof Condition: ☐ Good ☐ Poor

3. Type: ☐ Cone ☐ Dome

4. Height: _____ feet

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

5. Internal Floating Roof Tank

A. Tank Characteristics:

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Number of Columns: _____
6. Self-Supporting Roof? ☐ Yes ☐ No
7. Effective Column Diameter:
   ☐ 9"x7" Built-up Column ☐ 8" Diameter Pipe ☐ Unknown
8. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining
9. External Shell Color/Shade:
   ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
10. External Shell Condition: ☐ Good ☐ Poor
11. Roof Color/Shade:
    ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
    ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
12. Roof Condition: ☐ Good ☐ Poor

B. Rim Seal System:

1. Primary Seal: ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted
2. Secondary Seal: ☐ Shoe-mounted ☐ Rim-mounted ☐ None

C. Deck Characteristics:

1. Deck Type: ☐ Bolted ☐ Welded
2. Deck Fitting Category: ☐ Typical ☐ Detail

6. External Floating Roof Tank

A. Tank Characteristics

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

6. External Floating Roof Tank (continued)

A. Tank Characteristics (continued):

6. Paint Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

7. Paint Condition: ☐ Good ☐ Poor

B. Roof Characteristics

1. Roof Type: ☐ Pontoon ☐ Double Deck

2. Roof Fitting Category: ☐ Typical ☐ Detail

C. Tank Construction and Rim-Seal System:

1. Tank Construction: ☐ Welded ☐ Riveted

2. Primary Seal:
☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted

3. Secondary Seal
☐ None ☐ Shoe-mounted ☐ Rim-mounted ☐ Weather shield

7. Pollutant Emissions

A. Fixed Roof Emissions:

Pollutant[1]	Working Loss (tons/yr)	Breathing Loss (tons/yr)	Total Emissions (tons/yr)
VOC	0.01	0.03	0.04

B. Floating Roof Emissions:

Pollutant[1]	Rim Seal Loss (tons/yr)	Withdrawal Loss (tons/yr)	Deck Fitting Loss (tons/yr)	Deck Seam Loss (tons/yr)	Landing Loss[2] (tons/yr)	Total Emissions (tons/yr)

1. All regulated air pollutants including hazardous air pollutants emitted from this source should be listed in accordance with the OGP Application Instructions. A list of regulated air pollutants and a link to EPA's list of hazardous air pollutants is provided in the OGP Application Instructions.
2. Landing losses should be determined according to the procedures in *Organic Liquid Storage Tanks* chapter of EPA's AP-42 emission factors. If the roof is not landed at least once/yr, enter "NA".

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-019 (15-07-CST)

B. Product(s) Stored: Organic Chemical Blend (assumes 100% N-Hexane as worst case)

C. Status: ☒ Operating ☐ Proposed ☐ Under Construction

D. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction: July 2007

2. Tank Data

A. Tank Specifications:

1.	Design capacity	2,000	gallons		
2.	True vapor pressure at storage temperature:	2.636	psia @	72.70	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	3.326	psia @	82.82	ºF
4.	Reid vapor pressure at storage temperature:	2.636	psia @	72.24	ºF
5.	Density of product at storage temperature:	N/A	lb/gal		
6.	Molecular weight of product vapor at storage temp.	86.18	lb/lbmol		

B. Tank Orientation: ☐ Vertical ☒ Horizontal

C. Type of Tank:

☒ Fixed Roof ☐ External Floating Roof ☐ Internal Floating Roof

☐ Pressure ☐ Variable Vapor Space ☐ Other: _____

D. Is the tank equipped with a Vapor Recovery System and/or flare? ☐ Yes ☒ No

If yes, describe below and include the efficiency of each.

E. Closest City:

☒ Jackson, MS ☐ Meridian, MS ☐ Tupelo, MS ☐ Mobile, AL

☐ New Orleans, LA ☐ Memphis, TN ☐ Baton Rouge, LA

F. Is an E&P or similar report described in Condition 5.4(5) of the General Permit included for this tank in the Notice of Intent? ☒ Yes ☐ No

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary — Section OPGP-E

3. Horizontal Fixed Roof Tank

A. Shell Length: 6 feet
B. Shell Diameter: 7.5 feet
C. Working Volume: 2,000 gal
D. Maximum Throughput: 12,000 gal/yr
E. Is the tank heated? ☐ Yes ☒ No
F. Is the tank underground? ☐ Yes ☒ No
G. Shell Color/Shade:

☐ ☐ Aluminum/Specular ☐ Aluminum/Diffuse

☐ Gray/Light ☐ Gray/Medium ☒ Red/Primer

H. Shell Condition: ☒ Good ☐ Poor

4. Vertical Fixed Roof Tank

A. Dimensions:
1. Shell Height: _____ feet
2. Shell Diameter: _____ feet
3. Maximum Liquid Height: _____ feet
4. Average Liquid Height: _____ feet
5. Working Volume: _____ gal
6. Turnovers per year: _____
7. Maximum throughput: _____ BBLs/yr
8. Is the tank heated? ☐ Yes ☐ No

B. Shell Characteristics:
1. Shell Color/Shade:

☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse

☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

2. Shell Condition: ☐ Good ☐ Poor

C. Roof Characteristics:
1. Roof Color/Shade:

☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse

☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

2. Roof Condition: ☐ Good ☐ Poor

3. Type: ☐ Cone ☐ Dome

4. Height: _____ feet

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

5. Internal Floating Roof Tank

A. Tank Characteristics:

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Number of Columns: _____
6. Self-Supporting Roof? ☐ Yes ☐ No
7. Effective Column Diameter:
   ☐ 9"x7" Built-up Column ☐ 8" Diameter Pipe ☐ Unknown
8. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining
9. External Shell Color/Shade:
   ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
10. External Shell Condition: ☐ Good ☐ Poor
11. Roof Color/Shade:
    ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
    ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
12. Roof Condition: ☐ Good ☐ Poor

B. Rim Seal System:

1. Primary Seal: ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted
2. Secondary Seal: ☐ Shoe-mounted ☐ Rim-mounted ☐ None

C. Deck Characteristics:

1. Deck Type: ☐ Bolted ☐ Welded
2. Deck Fitting Category: ☐ Typical ☐ Detail

6. External Floating Roof Tank

A. Tank Characteristics

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

6. External Floating Roof Tank (continued)

A. Tank Characteristics (continued):

6. Paint Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

7. Paint Condition: ☐ Good ☐ Poor

B. Roof Characteristics

1. Roof Type: ☐ Pontoon ☐ Double Deck

2. Roof Fitting Category: ☐ Typical ☐ Detail

C. Tank Construction and Rim-Seal System:

1. Tank Construction: ☐ Welded ☐ Riveted

2. Primary Seal:
☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted

3. Secondary Seal
☐ None ☐ Shoe-mounted ☐ Rim-mounted ☐ Weather shield

7. Pollutant Emissions

A. Fixed Roof Emissions:

Pollutant[1]	Working Loss (tons/yr)	Breathing Loss (tons/yr)	Total Emissions (tons/yr)
VOC	0.03	0.13	0.16

B. Floating Roof Emissions:

Pollutant[1]	Rim Seal Loss (tons/yr)	Withdrawal Loss (tons/yr)	Deck Fitting Loss (tons/yr)	Deck Seam Loss (tons/yr)	Landing Loss[2] (tons/yr)	Total Emissions (tons/yr)

1. All regulated air pollutants including hazardous air pollutants emitted from this source should be listed in accordance with the OGP Application Instructions. A list of regulated air pollutants and a link to EPA's list of hazardous air pollutants is provided in the OGP Application Instructions.
2. Landing losses should be determined according to the procedures in *Organic Liquid Storage Tanks* chapter of EPA's AP-42 emission factors. If the roof is not landed at least once/yr, enter "NA".

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-024 (22-17-GST)

B. Product(s) Stored: Gasoline

C. Status: ☒ Operating ☐ Proposed ☐ Under Construction

D. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction: Prior to 2018

2. Tank Data

A. Tank Specifications:

1.	Design capacity	1,000	gallons		
2.	True vapor pressure at storage temperature:	8.670	psia @	72.13	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	10.352	psia @	82.25	ºF
4.	Reid vapor pressure at storage temperature:	8.670	psia @	72.13	ºF
5.	Density of product at storage temperature:	N/A	lb/gal		
6.	Molecular weight of product vapor at storage temp.	62	lb/lbmol		

B. Tank Orientation: ☐ Vertical ☒ Horizontal

C. Type of Tank:

☒ Fixed Roof ☐ External Floating Roof ☐ Internal Floating Roof

☐ Pressure ☐ Variable Vapor Space ☐ Other: _____

D. Is the tank equipped with a Vapor Recovery System and/or flare? ☐ Yes ☒ No

If yes, describe below and include the efficiency of each.

E. Closest City:

☒ Jackson, MS ☐ Meridian, MS ☐ Tupelo, MS ☐ Mobile, AL

☐ New Orleans, LA ☐ Memphis, TN ☐ Baton Rouge, LA

F. Is an E&P or similar report described in Condition 5.4(5) of the General Permit included for this tank in the Notice of Intent? ☒ Yes ☐ No

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

3. Horizontal Fixed Roof Tank

A. Shell Length: 7 feet
B. Shell Diameter: 5 feet
C. Working Volume: 1,000 gal
D. Maximum Throughput: 10,000 gal/yr
E. Is the tank heated? ☐ Yes ☒ No
F. Is the tank underground? ☐ Yes ☒ No
G. Shell Color/Shade:

☐ ☐ Aluminum/Specular ☐ Aluminum/Diffuse

☐ Gray/Light ☐ Gray/Medium ☒ Red/Primer

H. Shell Condition: ☒ Good ☐ Poor

4. Vertical Fixed Roof Tank

A. Dimensions:
1. Shell Height: _____ feet
2. Shell Diameter: _____ feet
3. Maximum Liquid Height: _____ feet
4. Average Liquid Height: _____ feet
5. Working Volume: _____ gal
6. Turnovers per year: _____
7. Maximum throughput: _____ BBLs/yr
8. Is the tank heated? ☐ Yes ☐ No

B. Shell Characteristics:
1. Shell Color/Shade:

☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse

☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

2. Shell Condition: ☐ Good ☐ Poor

C. Roof Characteristics:
1. Roof Color/Shade:

☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse

☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

2. Roof Condition: ☐ Good ☐ Poor

3. Type: ☐ Cone ☐ Dome

4. Height: _____ feet

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

5. Internal Floating Roof Tank

A. Tank Characteristics:

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Number of Columns: _____
6. Self-Supporting Roof? ☐ Yes ☐ No
7. Effective Column Diameter:
   ☐ 9"x7" Built-up Column ☐ 8" Diameter Pipe ☐ Unknown
8. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining
9. External Shell Color/Shade:
   ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
10. External Shell Condition: ☐ Good ☐ Poor
11. Roof Color/Shade:
    ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
    ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
12. Roof Condition: ☐ Good ☐ Poor

B. Rim Seal System:

1. Primary Seal: ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted
2. Secondary Seal: ☐ Shoe-mounted ☐ Rim-mounted ☐ None

C. Deck Characteristics:

1. Deck Type: ☐ Bolted ☐ Welded
2. Deck Fitting Category: ☐ Typical ☐ Detail

6. External Floating Roof Tank

A. Tank Characteristics

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

6. External Floating Roof Tank (continued)

A. Tank Characteristics (continued):

6. Paint Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

7. Paint Condition: ☐ Good ☐ Poor

B. Roof Characteristics

1. Roof Type: ☐ Pontoon ☐ Double Deck

2. Roof Fitting Category: ☐ Typical ☐ Detail

C. Tank Construction and Rim-Seal System:

1. Tank Construction: ☐ Welded ☐ Riveted

2. Primary Seal:
☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted

3. Secondary Seal
☐ None ☐ Shoe-mounted ☐ Rim-mounted ☐ Weather shield

7. Pollutant Emissions

A. Fixed Roof Emissions:

Pollutant[1]	Working Loss (tons/yr)	Breathing Loss (tons/yr)	Total Emissions (tons/yr)
VOC	0.06	0.38	0.44

B. Floating Roof Emissions:

Pollutant[1]	Rim Seal Loss (tons/yr)	Withdrawal Loss (tons/yr)	Deck Fitting Loss (tons/yr)	Deck Seam Loss (tons/yr)	Landing Loss[2] (tons/yr)	Total Emissions (tons/yr)

1. All regulated air pollutants including hazardous air pollutants emitted from this source should be listed in accordance with the OGP Application Instructions. A list of regulated air pollutants and a link to EPA's list of hazardous air pollutants is provided in the OGP Application Instructions.
2. Landing losses should be determined according to the procedures in *Organic Liquid Storage Tanks* chapter of EPA's AP-42 emission factors. If the roof is not landed at least once/yr, enter "NA".

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-025 (23-17-DST)

B. Product(s) Stored: Diesel (assumes Distillate Fuel No. 2 as worst case)

C. Status: ☒ Operating ☐ Proposed ☐ Under Construction

D. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction: Prior to 2018

2. Tank Data

A. Tank Specifications:

1.	Design capacity	1,000	gallons		
2.	True vapor pressure at storage temperature:	0.010	psia @	72.13	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	0.013	psia @	82.25	ºF
4.	Reid vapor pressure at storage temperature:	0.010	psia @	72.13	ºF
5.	Density of product at storage temperature:	N/A	lb/gal		
6.	Molecular weight of product vapor at storage temp.	130	lb/lbmol		

B. Tank Orientation: ☐ Vertical ☒ Horizontal

C. Type of Tank:

☒ Fixed Roof ☐ External Floating Roof ☐ Internal Floating Roof

☐ Pressure ☐ Variable Vapor Space ☐ Other: _____

D. Is the tank equipped with a Vapor Recovery System and/or flare? ☐ Yes ☒ No

If yes, describe below and include the efficiency of each.

E. Closest City:

☒ Jackson, MS ☐ Meridian, MS ☐ Tupelo, MS ☐ Mobile, AL

☐ New Orleans, LA ☐ Memphis, TN ☐ Baton Rouge, LA

F. Is an E&P or similar report described in Condition 5.4(5) of the General Permit included for this tank in the Notice of Intent? ☒ Yes ☐ No

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

3. Horizontal Fixed Roof Tank

A. Shell Length: 7 feet
B. Shell Diameter: 5 feet
C. Working Volume: 1,000 gal
D. Maximum Throughput: 10,000 gal/yr
E. Is the tank heated? ☐ Yes ☒ No
F. Is the tank underground? ☐ Yes ☒ No
G. Shell Color/Shade:

☐ ☐ Aluminum/Specular ☐ Aluminum/Diffuse

☐ Gray/Light ☐ Gray/Medium ☒ Red/Primer

H. Shell Condition: ☒ Good ☐ Poor

4. Vertical Fixed Roof Tank

A. Dimensions:
1. Shell Height: _____ feet
2. Shell Diameter: _____ feet
3. Maximum Liquid Height: _____ feet
4. Average Liquid Height: _____ feet
5. Working Volume: _____ gal
6. Turnovers per year: _____
7. Maximum throughput: _____ BBLs/yr
8. Is the tank heated? ☐ Yes ☐ No

B. Shell Characteristics:
1. Shell Color/Shade:

☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse

☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

2. Shell Condition: ☐ Good ☐ Poor

C. Roof Characteristics:
1. Roof Color/Shade:

☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse

☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

2. Roof Condition: ☐ Good ☐ Poor

3. Type: ☐ Cone ☐ Dome

4. Height: _____ feet

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

5. Internal Floating Roof Tank

A. Tank Characteristics:

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Number of Columns: _____
6. Self-Supporting Roof? ☐ Yes ☐ No
7. Effective Column Diameter:
   ☐ 9"x7" Built-up Column ☐ 8" Diameter Pipe ☐ Unknown
8. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining
9. External Shell Color/Shade:
   ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
10. External Shell Condition: ☐ Good ☐ Poor
11. Roof Color/Shade:
    ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
    ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
12. Roof Condition: ☐ Good ☐ Poor

B. Rim Seal System:

1. Primary Seal: ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted
2. Secondary Seal: ☐ Shoe-mounted ☐ Rim-mounted ☐ None

C. Deck Characteristics:

1. Deck Type: ☐ Bolted ☐ Welded
2. Deck Fitting Category: ☐ Typical ☐ Detail

6. External Floating Roof Tank

A. Tank Characteristics

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary | Section OPGP-E

6. External Floating Roof Tank (continued)

A. Tank Characteristics (continued):

6. Paint Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

7. Paint Condition: ☐ Good ☐ Poor

B. Roof Characteristics

1. Roof Type: ☐ Pontoon ☐ Double Deck

2. Roof Fitting Category: ☐ Typical ☐ Detail

C. Tank Construction and Rim-Seal System:

1. Tank Construction: ☐ Welded ☐ Riveted

2. Primary Seal:
☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted

3. Secondary Seal
☐ None ☐ Shoe-mounted ☐ Rim-mounted ☐ Weather shield

7. Pollutant Emissions

A. Fixed Roof Emissions:

Pollutant[1]	Working Loss (tons/yr)	Breathing Loss (tons/yr)	Total Emissions (tons/yr)
VOC	0.00	0.00	0.00

B. Floating Roof Emissions:

Pollutant[1]	Rim Seal Loss (tons/yr)	Withdrawal Loss (tons/yr)	Deck Fitting Loss (tons/yr)	Deck Seam Loss (tons/yr)	Landing Loss[2] (tons/yr)	Total Emissions (tons/yr)

1. All regulated air pollutants including hazardous air pollutants emitted from this source should be listed in accordance with the OGP Application Instructions. A list of regulated air pollutants and a link to EPA's list of hazardous air pollutants is provided in the OGP Application Instructions.
2. Landing losses should be determined according to the procedures in *Organic Liquid Storage Tanks* chapter of EPA's AP-42 emission factors. If the roof is not landed at least once/yr, enter "NA".

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Flare | Section OPGP-F

1. Equipment Description

A. Emission Point Designation (Ref. No.): AA-002 (11-07-F)

B. Equipment Description (include the process(es) that the flare controls emissions from):
Control flare to combust emissions from oil storage tanks (EPNs: 2a-07-OST-CV, 3-07-OST-V, 7a-07-OST-CV, 8-07-IOT-V, & 9-07-IOT-V).

C. Manufacturer: N/A D. Model: N/A

E. Status: ☒ Operating ☐ Proposed ☐ Under Construction

F. ☐ Requesting a federally enforceable condition to route tank emissions to the flare.

2. System Data

A. Efficiency: 98 % Controlling the following pollutant(s): VOC, HAPs
Efficiency: ____ % Controlling the following pollutant(s): ____
Reason for different efficiency: ____

B. Flare Data (if applicable):

1. Flare type: ☒ Non-assisted ☐ Steam-assisted ☐ Air-assisted ☐ Other: ____

2. Net heating value of combusted gas: 742 Btu/scf

3. Design exit velocity: N/A ft/sec

4. System: ☒ Auto-ignitor ☒ Continuous Flame

5. Is the presence of a flare pilot flame monitored? ☒ Yes ☐ No

If yes, please describe the monitoring: The presence of the flare pilot flame is continuously monitored by use of a thermocouple.*

6. Is the auto-ignitor system monitored? ☒ Yes ☐ No

If yes, please describe the monitoring: The flare is equipped with an auto-igniter.*

*Denbury will maintain a flare pilot flame or auto-igniter system at all times when emissions may be vented to the flare. Denbury will either continuously monitor & record the presence of the flare pilot flame by use of a thermocouple OR maintain & operate an auto-igniter system on the flare to ensure a flame is immediately restored when emissions are being sent to the flare.

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Flare | Section OPGP-F

1. Equipment Description

A. Emission Point Designation (Ref. No.): AA-003 (12-07-F)

B. Equipment Description (include the process(es) that the flare controls emissions from):
Control flare to combust emissions from heater treater flash gas & water flash drum flash gas (EPN: 18-07-HT-WG & 19-07-WFD-WG).

C. Manufacturer: N/A D. Model: N/A

E. Status: ☒ Operating ☐ Proposed ☐ Under Construction

F. ☐ Requesting a federally enforceable condition to route tank emissions to the flare.

2. System Data

A. Efficiency: 98 % Controlling the following pollutant(s): VOC, HAPs
Efficiency: _____ % Controlling the following pollutant(s): _____
Reason for different efficiency: _____

B. Flare Data (if applicable):

1. Flare type: ☒ Non-assisted ☐ Steam-assisted ☐ Air-assisted ☐ Other: _____

2. Net heating value of combusted gas: 206 Btu/scf

3. Design exit velocity: N/A ft/sec

4. System: ☒ Auto-ignitor ☒ Continuous Flame

5. Is the presence of a flare pilot flame monitored? ☒ Yes ☐ No

If yes, please describe the monitoring: The presence of the flare pilot flame is continuously monitored by use of a thermocouple.*

6. Is the auto-ignitor system monitored? ☒ Yes ☐ No

If yes, please describe the monitoring: The flare is equipped with an auto-igniter.*

*Denbury will maintain a flare pilot flame or auto-igniter system at all times when emissions may be vented to the flare. Denbury will either continuously monitor & record the presence of the flare pilot flame by use of a thermocouple OR maintain & operate an auto-igniter system on the flare to ensure a flame is immediately restored when emissions are being sent to the flare.

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Compliance Plan — Section OPGP-G

Part 1. Equipment List

List all equipment and the corresponding federal and/or state regulation that is applicable. Clearly identify federal regulations from state requirements. Provide the expected or actual construction date, startup date and removal date if the equipment is no longer on site.

EMISSION UNIT (Ref No.)	FEDERAL or STATE REGULATION Ex. 40 CFR Part _____, Subpart _____ Ex. 11 Miss. Admin. Code Pt. 2, R. 1.4.B(2).	CONSTRUCTION DATE	STARTUP DATE	REMOVAL DATE
11-07-F *Atmospheric Control Flare* 12-07-F *Low Pressure Control Flare*	11 Miss. Admin. Code Pt. 2, R.1.4.B(2).	2007	2007	N/A

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Compliance Plan — Section OPGP-G

Part 2. Applicable Requirements

List all applicable state and federal requirements, including emission limits, operating restrictions, etc., and the applicable test methods or monitoring used to demonstrate compliance with each applicable requirement. Clearly identify federal regulations from state requirements. Provide the compliance status as of the day the application is signed.

EMISSION UNIT (Ref No.)	APPLICABLE REQUIREMENT (Specific Regulatory citation)	POLLUTANT	LIMITS/ REQUIREMENTS	TEST METHOD/ COMPLIANCE MONITORING
11-07-F *Atmospheric Control Flare* 12-07-F *Low Pressure Control Flare*	11 Miss. Admin. Code Pt. 2, R.1.4.B(2).	H_2S	1 grain H_2S per 100 standard cubic feet (1 gr/100 scf)	Recordkeeping of H_2S composition of gas by gas analysis; Maintenance of continuous flame for gas combustion.

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Compliance Plan — Section OPGP-G

Part 2. Applicable Requirements

List all applicable state and federal requirements, including emission limits, operating restrictions, etc., and the applicable test methods or monitoring used to demonstrate compliance with each applicable requirement. Clearly identify federal regulations from state requirements. Provide the compliance status as of the day the application is signed.

EMISSION UNIT (Ref No.)	APPLICABLE REQUIREMENT (Specific Regulatory citation)	POLLUTANT	LIMITS/ REQUIREMENTS	TEST METHOD/ COMPLIANCE MONITORING
11-07-F *Atmospheric Control Flare* 12-07-F *Low Pressure Control Flare*	11 Miss. Admin. Code Pt. 2, R.2.2.B(10).	VOC, HAPs	Flare Operating Requirements	The flare shall be operated at all times when emissions may be vented to it. The flare is anticipated to provide a significant reduction in hydrocarbon emissions. Based on manufacturer's data, a minimum of 98% reduction can be expected. It should also be noted that the facility will operate the flare such that criteria pollutant emissions will not exceed emission rates restricted in the Oil Production General Permit, nor will hazardous air pollutant (HAP) emissions exceed any HAP emission rates restricted in the Oil Production General Permit.

Part 2. Applicable Requirements

List all applicable state and federal requirements, including emission limits, operating restrictions, etc., and the applicable test methods or monitoring used to demonstrate compliance with each applicable requirement. Clearly identify federal regulations from state requirements. Provide the compliance status as of the day the application is signed.

11-07-F *Atmospheric Control Flare* 12-07-F *Low Pressure Control Flare*	11 Miss. Admin. Code Pt. 2, R.2.2.B(11).	VOC, HAPs	Monitoring and recordkeeping	Denbury shall maintain a flare pilot flame or auto-igniter system at all times when emissions may be vented to the flare. Denbury will either continuously monitor & record the presence of the flare pilot flame by use of a thermocouple OR maintain & operate an auto-igniter system on the flare to ensure a flame is immediately restored when emissions are being sent to the flare. The flare shall be operated with no visible emissions as determined by EPA Method 22, except for periods not to exceed a total of five (5) minutes during any two (2) consecutive hours. Records of all visual observations/tests and corrective action shall be maintained.

Emission Calculations

POINT SOURCE I.D. NUMBER: ***1-07-SBP***

EMISSION SOURCE DESCRIPTION: ***Sand Blowdown Pit (ZZZ-130)***

DATA:

Emission Source:	***Flash Gas from Brine Solution****
Max. Pressure Drop of Brine Solution: (psig)	***820***
Approx. Temperature of Brine Solution: (^{o}F)	***70***
Flash Gas Specific Gravity: ***(based on an actual wet gas analysis)***	***1.4172***
Avg. Water Throughput: (BBL/Hr)	***250***
Max. Water Throughput: (BBL/Hr)	***250***
Blowdown Hours per Year:	***730***
Gas to Water Ratio: (SCF/BBL of Brine; GWR)	***8.2***
Basis of Emission Estimates:	***API Documentation & Actual Wet Gas Analysis***

**Associated with vessel blowdowns*

Avg. Hourly Uncontrolled Flash Rate (SCF/Hr)	=	Brine Rate * GWR	=	**2050.00**
Avg. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Flash Gas Gravity * Density of Air * Flash Rate	=	**221.96**
Max. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Hourly * Ratio of Max. Water Rate to Avg. Water Rate	=	**221.96**
Annual Potential Uncontrolled Flash Emissions (TPY)	=	Hourly * Blowdown Hours/2000	=	**81.02**

EMISSION ESTIMATES:

The magnitude of the solubility of natural gas in the interstitial water present in oil sands was studied by The American Petroleum Institute (API) and presented in a 1944 document entitled, "P-V-T and Solubility Relations" (refer to ensuing pages). Results of these studies have been projected to provide estimates of gas volumes present in the brine solution handled at this site within the specific pressure and temperature ranges expected. The composition of this gas is based on an actual wet gas analysis and normalized to account for the presence of H_2S; refer to Southern Petroleum Laboratories Report No.: 172-23080182-003A in ensuing pages.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.1196	0.2655	0.2655	0.0969
Carbon Dioxide (excluded from VOC total)	92.3491	204.9798	204.9798	74.8170
Methane (excluded from VOC total)	4.1413	9.1921	9.1921	3.3551
Ethane (excluded from VOC total)	1.0647	2.3631	2.3631	0.8625
Hydrogen Sulfide (excluded from VOC total)	0.0013	0.0029	0.0029	0.0011
Propane	0.6228	1.3824	1.3824	0.5046
Iso-Butane	0.2073	0.4602	0.4602	0.1680
N-Butane	0.3370	0.7480	0.7480	0.2730

Iso-Pentane	0.2319	0.5147	0.5147	0.1879
N-Pentane	0.1573	0.3491	0.3491	0.1274
Iso-Hexane	0.1692	0.3756	0.3756	0.1371
N-Hexane (TAP)	0.0816	0.1810	0.1810	0.0661
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.0395	0.0877	0.0877	0.0320
Cyclohexane	0.0561	0.1245	0.1245	0.0455
Heptanes	0.1548	0.3436	0.3436	0.1254
Methylcyclohexane	0.0666	0.1479	0.1479	0.0540
Toluene (TAP)	0.0170	0.0378	0.0378	0.0138
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.0806	0.1789	0.1789	0.0653
Ethylbenzene (TAP)	0.0013	0.0029	0.0029	0.0010
Xylenes (TAP)	0.0114	0.0252	0.0252	0.0092
Nonanes	0.0646	0.1434	0.1434	0.0523
Decanes Plus	0.0249	0.0553	0.0553	0.0202
Total Weight Percent:	100.0000			
Total TAP Emissions		0.34	0.34	0.12
Total VOC Emissions		**5.16**	**5.16**	**1.88**
Total Non VOC & Non TAP-HC		11.56	11.56	4.22
Total Emissions		221.96	221.96	81.02

VOC Emission Total (TPY)	=	Brine Flash	=	**1.88**

Emission Calculations

Emission calculations shown below are presented for informational purposes only as vapors from the dry oil tank are routed to the atmospheric control flare (EPN: 11-07-F) for combustion, except during brief intervals when thief hatches are opened for purposes of sampling, gauging, etc.

POINT SOURCE I.D. NUMBER: ***2a-07-OST-CV***

EMISSION SOURCE DESCRIPTION: ***5000 BBL Dry Oil Tank-Common Vent (ABJ-119A)***

DATA:

Emission Source:	***Crude Oil Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD - Q_{avg})**	***3000***
Maximum Daily Oil Throughput: **(BBLD - Q_{max})**	***3000***
Average VOC Working Losses - L_w (lb/yr):	***188,144.451***
Average VOC Standing Losses - L_S (lb/yr):	***10,941.731***
Basis of Estimates:	***AP-42, Chapter 7 (June 2020, Section 7.1.3.1); Refer to ensuing pages for summary***

Avg. Hourly Uncontrolled THC Losses (lb/hr)	= (Lw + Ls) * 1.134/8760	=	**25.77**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**25.77**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**112.88**

SPECIATION FACTORS:

Speciation factors were taken from "Air Emissions Species Manual - Volume I: Volatile Organic Compound Species Profiles", 2nd edition; Report No.: EPA-450/2-90-001a; page 258 and normalized to account for the presence of H_2S; reference ensuing pages.

UNCONTROLLED EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Hydrogen Sulfide (excluded from VOC total)	0.0033	0.0009	0.0009	0.0038
Methane (excluded from VOC total)	6.1995	1.5977	1.5977	6.9981
Ethane (excluded from VOC total)	5.5993	1.4431	1.4431	6.3206
Propane	17.5997	4.5358	4.5358	19.8668
Iso-Butane	1.5004	0.3867	0.3867	1.6937
N-Butane	27.0994	6.9841	6.9841	30.5903
Iso-Pentane	1.4996	0.3865	0.3865	1.6928
N-Pentane	14.5991	3.7625	3.7625	16.4798
Heptane	9.2001	2.3711	2.3711	10.3852
Octane	6.8992	1.7781	1.7781	7.7880
Other NM/NE Hydrocarbons	1.7994	0.4637	0.4637	2.0312

N-Hexane (TAP)	7.9004	2.0361	2.0361	8.9182
Benzene (TAP)	0.1005	0.0259	0.0259	0.1135
Total TAP Emissions		2.06	2.06	9.04
Total VOC Emissions		**22.73**	**22.73**	**99.56**
Total Non VOC & Non TAP-HC		3.04	3.04	13.32
Total Hydrocarbon Emissions		25.77	25.77	112.88

DATA:

Emission Source:	***Flash Gas from Oil***
Flash Gas Specific Gravity:	***1.5130***
Average Oil Throughput: (BBLD)	***3000***
Maximum Oil Throughput: (BBLD)	***3000***
Basis of Emission Estimates:	***Actual Oil Flash Analysis***

Estimates for gas volumes and composition associated with this stage of the process were derived from a laboratory test of an oil sample collected at this facility and normalized to account for the presence of H_2S; refer to Southern Petroleum Laboratories Report No.: 23080182-006A in ensuing pages. The following table shows the actual field & laboratory conditions:

API Oil Gravity @ 60°F	**Process Conditions**		**Gas/Oil Ratio**
	Pressure (PSIG)	**Temperature (°F)**	**(SCF/BBL)**
Actual Facility & Laboratory Conditions:			
40.52	50	120	
	0	60	27.60
		Prorated GOR Estimate:	**27.60**

Avg. Hourly Uncontrolled Flash Rate (SCF/Hr)	=	Oil Rate * GOR	=	**3450.00**
Avg. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Flash Gas Gravity * Density of Air * Flash Rate	=	**398.80**
Max. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Avg. Emissions * Ratio of Max. Oil Rate to Avg. Oil Rate	=	**398.80**
Annual Potential Uncontrolled Flash Emissions (TPY)	=	Hourly * 8760/2000	=	**1746.74**

SPECIATION FACTORS:

Speciation of the flash gas mixture taken from the referenced laboratory results and normalized to account for the presence of H_2S; refer to Southern Petroleum Laboratories Report No.: 23080182-006A in ensuing pages.

UNCONTROLLED EMISSIONS SUMMARY:

POLLUTANT:	**Weight Percent**	**CALCULATED EMISSION RATES**		
		Average Hourly (lb/hr)	**Maximum Hourly (lb/hr)**	**Annual (TPY)**
Nitrogen (excluded from VOC total)	0.7591	3.0272	3.0272	13.2591
Carbon Dioxide (excluded from VOC total)	81.7572	326.0449	326.0449	1428.0889
Methane (excluded from VOC total)	1.1517	4.5929	4.5929	20.1170
Ethane (excluded from VOC total)	2.5636	10.2237	10.2237	44.7803
Hydrogen Sulfide (excluded from VOC total)	0.0039	0.0155	0.0155	0.0678

Propane	4.1545	16.5679	16.5679	72.5681
Iso-Butane	1.7339	6.9147	6.9147	30.2868
N-Butane	2.8757	11.4682	11.4682	50.2313
Iso-Pentane	1.7380	6.9311	6.9311	30.3583
N-Pentane	1.0902	4.3475	4.3475	19.0422
Iso-Hexane	0.8641	3.4461	3.4461	15.0942
N-Hexane (TAP)	0.4851	1.9345	1.9345	8.4733
Methylcyclopentane	0.1534	0.6119	0.6119	2.6802
Benzene (TAP)	0.0427	0.1704	0.1704	0.7463
Cyclohexane	0.1515	0.6043	0.6043	2.6467
Heptanes	0.2740	1.0928	1.0928	4.7867
Methylcyclohexane	0.0649	0.2588	0.2588	1.1334
Toluene (TAP)	0.0126	0.0502	0.0502	0.2201
2,2,4-Trimethylpentane (TAP)	0.0521	0.2076	0.2076	0.9094
Octanes	0.0286	0.1142	0.1142	0.5002
Ethylbenzene (TAP)	0.0000	0.0000	0.0000	0.0000
Xylenes (TAP)	0.0048	0.0193	0.0193	0.0845
Nonanes	0.0351	0.1399	0.1399	0.6126
Decanes Plus	0.0032	0.0129	0.0129	0.0566
Total Weight Percent:	100.0000			
Total TAP Emissions		2.40	2.40	10.50
Total VOC Emissions		**54.89**	**54.89**	**240.43**
Total Non VOC & Non TAP-HC		14.82	14.82	64.90
Total Emissions		398.80	398.80	1746.74

DATA:

Emission Source:	***Blanket Gas****
Average Annual Tank Throughput (BBLs/Yr):	***1,095,000***
Gross Blanket Gas Required (MSCF/Yr):	***6,148***
Gas from Process to Tank(s) (MSCF/Yr):	***30,222***
Calculated Volume Requirement (MSCF/Yr):	***-24,074***

**There are no emissions associated with supplied blanket gas as flash generated from this tank should be sufficient to maintain the gas blanket as demonstrated herein.*

Uncontrolled VOC Emission Total (TPY)	Storage Vapors + Oil Flash + Blanket Gas	=	**339.99**

DATA:

Emission Source:	***Losses When Opening Thief Hatches***
Specific Gravity of Gas:	***1.5130***
Maximum Thief Hatch Venting (Hrs/Yr) **(Under Normal/Routine Operating Conditions)**	***30***
Max. Minutes a Hatch is Opened in a Single Hour:	***5***
Maximum Hourly Emission Rate (lb/hr): **(from preceding tank emission estimates)**	***35.38***

Avg. Hourly Emissions (lb/hr)	=	Annual Total/8760 (hrs/yr)	=	**1.47**
Maximum Hourly Emissions (lb/hr)	=	Max. Emission Rate * Max. Minutes/Hr Hatch is Open	=	**35.38**
Maximum Annual Emissions (TPY)	=	Max. Hourly THC Rate * Hours/Yr Hatch is Open	=	**6.46**

EMISSION SUMMARY (based on the above referenced oil flash analysis):

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.7591	0.011	0.269	0.049
Carbon Dioxide (excluded from VOC total)	81.7572	1.206	28.926	5.279
Methane (excluded from VOC total)	1.1517	0.017	0.407	0.074
Ethane (excluded from VOC total)	2.5636	0.038	0.907	0.166
Hydrogen Sulfide (excluded from VOC total)	0.0039	0.000	0.001	0.000
Propane	4.1545	0.061	1.470	0.268
Iso-Butane	1.7339	0.026	0.613	0.112
N-Butane	2.8757	0.042	1.017	0.186
Iso-Pentane	1.7380	0.026	0.615	0.112
N-Pentane	1.0902	0.016	0.386	0.070
Iso-Hexane	0.8641	0.013	0.306	0.056
N-Hexane (TAP)	0.4851	0.007	0.172	0.031
Methylcyclopentane	0.1534	0.002	0.054	0.010
Benzene (TAP)	0.0427	0.001	0.015	0.003
Cyclohexane	0.1515	0.002	0.054	0.010
Heptanes	0.2740	0.004	0.097	0.018
Methylcyclohexane	0.0649	0.001	0.023	0.004
Toluene (TAP)	0.0126	0.000	0.004	0.001
2,2,4-Trimethylpentane (TAP)	0.0521	0.001	0.018	0.003
Octanes	0.0286	0.000	0.010	0.002
Ethylbenzene (TAP)	0.0000	0.000	0.000	0.000
Xylenes (TAP)	0.0048	0.000	0.002	0.000
Nonanes	0.0351	0.001	0.012	0.002

Decanes Plus	0.0032	0.000	0.001	0.000
Other NM/NE HC	0.0000	0.000	0.000	0.000
Total Weight Percent:	100.0000			
Total TAP Emissions		0.01	0.21	0.04
Total VOC Emissions		**0.20**	**4.87**	**0.89**
Total Non VOC & Non TAP-HC		0.05	1.31	0.24
Total Emissions		1.47	35.38	6.46

Emission Calculations

Emission calculations shown below are presented for informational purposes only as vapors from the wet oil tank are routed to the atmospheric control flare (EPN: 11-07-F) for combustion, except during brief intervals when thief hatches are opened for purposes of sampling, gauging, etc.

POINT SOURCE I.D. NUMBER: ***3-07-OST-V***

EMISSION SOURCE DESCRIPTION: ***1500 BBL Wet Oil Tank-Common Vent (BBJ-118)***

DATA:

Emission Source:	***Crude Oil Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD - Q_{avg})**	***10***
Maximum Daily Oil Throughput: **(BBLD - Q_{max})**	***10***
Average VOC Working Losses - L_W (lb/yr):	***623.339***
Average VOC Standing Losses - L_S (lb/yr):	***3,343.250***
Basis of Estimates:	***AP-42, Chapter 7 (June 2020, Section 7.1.3.1); Refer to ensuing pages for summary***

Avg. Hourly Uncontrolled THC Losses (lb/hr)	=	(Lw + Ls) * 1.134/8760	=	**0.51**
Max. Hourly Uncontrolled THC Losses (lb/hr)	=	(Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**0.51**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**2.25**

SPECIATION FACTORS:

Speciation factors were taken from "Air Emissions Species Manual - Volume I: Volatile Organic Compound Species Profiles", 2nd edition; Report No.: EPA-450/2-90-001a; page 258 and normalized to account for the presence of H_2S; reference ensuing pages.

UNCONTROLLED EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Hydrogen Sulfide (excluded from VOC total)	0.0011	0.0000	0.0000	0.0000
Methane (excluded from VOC total)	6.1996	0.0318	0.0318	0.1394
Ethane (excluded from VOC total)	5.5995	0.0288	0.0288	0.1259
Propane	17.6001	0.0904	0.0904	0.3958
Iso-Butane	1.5005	0.0077	0.0077	0.0337
N-Butane	27.1000	0.1392	0.1392	0.6095
Iso-Pentane	1.4996	0.0077	0.0077	0.0337
N-Pentane	14.5995	0.0750	0.0750	0.3284
Heptane	9.2003	0.0472	0.0472	0.2069
Octane	6.8994	0.0354	0.0354	0.1552
Other NM/NE Hydrocarbons	1.7994	0.0092	0.0092	0.0405

N-Hexane (TAP)	7.9006	0.0406	0.0406	0.1777
Benzene (TAP)	0.1005	0.0005	0.0005	0.0023
Total TAP Emissions		0.04	0.04	0.18
Total VOC Emissions		**0.45**	**0.45**	**1.98**
Total Non VOC & Non TAP-HC		0.06	0.06	0.27
Total Hydrocarbon Emissions		0.51	0.51	2.25

DATA:

Emission Source:	***Blanket Gas****
Average Annual Tank Throughput (BBLs/Yr):	***3,650***
Gross Blanket Gas Required (MSCF/Yr):	***20***
Gas from OST to Tank(s) (MSCF/Yr):	***24,074***
Calculated Volume Requirement (MSCF/Yr):	***-24,054***

**There are no emissions associated with supplied blanket gas as flash generated from the dry oil tank should be sufficient to maintain the gas blanket as demonstrated herein.*

Uncontrolled VOC Emission Total (TPY)	Storage Vapors + Blanket Gas	=	**1.98**

DATA:

Emission Source:	***Losses When Opening Thief Hatches***
Specific Gravity of Gas:	***1.7685***
Maximum Thief Hatch Venting (Hrs/Yr) **(Under Normal/Routine Operating Conditions)**	***30***
Max. Minutes a Hatch is Opened in a Single Hour:	***5***
Maximum Hourly Emission Rate (lb/hr): **(from preceding tank emission estimates)**	***0.04***

Avg. Hourly Emissions (lb/hr)	=	Total/8760 (hrs)	=	**0.00**
Maximum Hourly Emissions (lb/hr)	=	Max. Emission Rate * Max. Minutes/Hr Hatch is Open	=	**0.04**
Maximum Total Emissions (Tons)	=	Max. Hourly THC Rate * Hours Hatch is Open	=	**0.01**

EMISSION SUMMARY (based on the above referenced normalized storage vapor speciation):

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Methane (excluded from VOC total)	6.1996	0.000	0.002	0.000
Ethane (excluded from VOC total)	5.5995	0.000	0.002	0.000
Hydrogen Sulfide (excluded from VOC total)	0.0011	0.000	0.000	0.000
Propane	17.6001	0.000	0.007	0.001
Iso-Butane	1.5005	0.000	0.001	0.000
N-Butane	27.1000	0.001	0.011	0.002
Iso-Pentane	1.4996	0.000	0.001	0.000
N-Pentane	14.5995	0.000	0.006	0.001
N-Hexane (TAP)	7.9006	0.000	0.003	0.001
Benzene (TAP)	0.1005	0.000	0.000	0.000
Heptanes	9.2003	0.000	0.004	0.001

Octanes	6.8994	0.000	0.003	0.001
Other NM/NE HC	1.7994	0.000	0.001	0.000
Total Weight Percent:	100.0000			
Total TAP Emissions		0.00	0.00	0.00
Total VOC Emissions		**0.00**	**0.04**	**0.01**
Total Non VOC & Non TAP-HC		0.00	0.00	0.00
Total Emissions		0.00	0.04	0.01

Emission Calculations

POINT SOURCE I.D. NUMBER: *4a-07-ST-CV*

EMISSION SOURCE DESCRIPTION: *2000 BBL Skimmer Tank-Common Vent (ABJ-120A)*

DATA:

Emission Source:	***Crude Oil/Water Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD - Q_{avg})**	***10***
Maximum Daily Oil Throughput: **(BBLD - Q_{max})**	***10***
Average Daily Water Throughput: **(Annual Average; BBLD - Q_{avg})**	***10000***
Maximum Daily Water Throughput: **(BBLD - Q_{max})**	***10000***
Average VOC Working Losses - L_w (lb/yr):	***18,211.969***
Average VOC Standing Losses - L_S (lb/yr):	***152.552***
Basis of Estimates:	***AP-42, Chapter 7 (June 2020, Section 7.1.3.1); Refer to ensuing pages for summary***

Avg. Hourly Uncontrolled THC Losses (lb/hr)	= (Lw + Ls) * 1.134/8760	=	**2.38**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**2.38**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**10.41**

SPECIATION FACTORS:

Speciation factors were taken from "Air Emissions Species Manual - Volume I: Volatile Organic Compound Species Profiles", 2nd edition; Report No.: EPA-450/2-90-001a; page 258 and normalized to account for the presence of H_2S; reference ensuing pages.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Hydrogen Sulfide (excluded from VOC total)	0.0011	0.0000	0.0000	0.0001
Methane (excluded from VOC total)	6.1996	0.1474	0.1474	0.6455
Ethane (excluded from VOC total)	5.5995	0.1331	0.1331	0.5831
Propane	17.6001	0.4184	0.4184	1.8326
Iso-Butane	1.5005	0.0357	0.0357	0.1562
N-Butane	27.1000	0.6443	0.6443	2.8218
Iso-Pentane	1.4996	0.0357	0.0357	0.1562
N-Pentane	14.5995	0.3471	0.3471	1.5202
Heptane	9.2003	0.2187	0.2187	0.9580
Octane	6.8994	0.1640	0.1640	0.7184
Other NM/NE Hydrocarbons	1.7994	0.0428	0.0428	0.1874

N-Hexane (TAP)	7.9006	0.1878	0.1878	0.8227
Benzene (TAP)	0.1005	0.0024	0.0024	0.0105
Total Weight Percent:	100.0000			
Total TAP Emissions		0.19	0.19	0.83
Total VOC Emissions		**2.10**	**2.10**	**9.18**
Total Non VOC & Non TAP-HC		0.28	0.28	1.23
Total Hydrocarbon Emissions		2.38	2.38	10.41

DATA:

Emission Source:	***Flash Gas from Brine Solution***
Approx. Pressure Drop of Brine Solution: (psig)	***50***
Approx. Temperature of Brine Solution: (ºF)	***120***
Flash Gas Specific Gravity: ***(based on an actual wet gas analysis)***	***1.4172***
Avg. Water Throughput: (BBLD)	***10,000***
Max. Water Throughput: (BBLD)	***10,000***
Gas to Water Ratio: (SCF/BBL of Water; GWR)	***0.5***
Basis of Emission Estimates:	***API Documentation & Actual Wet Gas Analysis***

Avg. Hourly Uncontrolled Flash Rate (SCF/Hr)	=	Brine Rate * GWR	=	**208.33**
Avg. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Flash Gas Gravity * Density of Air * Flash Rate	=	**22.56**
Max. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Hourly * Ratio of Max. Water Rate to Avg. Water Rate	=	**22.56**
Annual Potential Uncontrolled Flash Emissions (TPY)	=	Hourly * 8760/2000	=	**98.81**

EMISSION ESTIMATES:

The magnitude of the solubility of natural gas in the interstitial water present in oil sands was studied by The American Petroleum Institute (API) and presented in a 1944 document entitled, "P-V-T and Solubility Relations" (refer to ensuing pages). Results of these studies have been projected to provide estimates of gas volumes present in the brine solution handled at this site within the specific pressure and temperature ranges expected. The composition of this gas is based on an actual wet gas analysis and normalized to account for the presence of H_2S; refer to Southern Petroleum Laboratories Report No.: 172-23080182-003A in ensuing pages.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.1196	0.0270	0.0270	0.1182
Carbon Dioxide (excluded from VOC total)	92.3491	20.8309	20.8309	91.2527
Methane (excluded from VOC total)	4.1413	0.9341	0.9341	4.0921
Ethane (excluded from VOC total)	1.0647	0.2402	0.2402	1.0520
Hydrogen Sulfide (excluded from VOC total)	0.0013	0.0003	0.0003	0.0013
Propane	0.6228	0.1405	0.1405	0.6154
Iso-Butane	0.2073	0.0468	0.0468	0.2049
N-Butane	0.3370	0.0760	0.0760	0.3330
Iso-Pentane	0.2319	0.0523	0.0523	0.2291
N-Pentane	0.1573	0.0355	0.0355	0.1554

Iso-Hexane	0.1692	0.0382	0.0382	0.1672
N-Hexane (TAP)	0.0816	0.0184	0.0184	0.0806
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.0395	0.0089	0.0089	0.0391
Cyclohexane	0.0561	0.0127	0.0127	0.0554
Heptanes	0.1548	0.0349	0.0349	0.1530
Methylcyclohexane	0.0666	0.0150	0.0150	0.0659
Toluene (TAP)	0.0170	0.0038	0.0038	0.0168
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.0806	0.0182	0.0182	0.0796
Ethylbenzene (TAP)	0.0013	0.0003	0.0003	0.0013
Xylenes (TAP)	0.0114	0.0026	0.0026	0.0112
Nonanes	0.0646	0.0146	0.0146	0.0638
Decanes Plus	0.0249	0.0056	0.0056	0.0246
Total Weight Percent:	100.0000			
Total TAP Emissions		0.03	0.03	0.15
Total VOC Emissions		**0.52**	**0.52**	**2.30**
Total Non VOC & Non TAP-HC		1.17	1.17	5.14
Total Emissions		22.56	22.56	98.81

DATA:

Emission Source:	***Flash Gas from Oil***
Flash Gas Specific Gravity:	***1.5130***
Average Oil Throughput: **(BBLD)**	***10***
Maximum Oil Throughput: **(BBLD)**	***10***
Basis of Emission Estimates:	***Actual Oil Flash Analysis***

Estimates for gas volumes and composition associated with this stage of the process were derived from a laboratory test of an oil sample collected at this facility and normalized to account for the presence of H_2S; refer to Southern Petroleum Laboratories Report No.: 23080182-006A in ensuing pages. The following table shows the actual field & laboratory conditions:

API Oil Gravity @ 60°F	**Process Conditions**		**Gas/Oil Ratio**
	Pressure (PSIG)	**Temperature (°F)**	**(SCF/BBL)**
Actual Facility & Laboratory Conditions:			
40.52	50	120	
	0	60	27.60
		Prorated GOR Estimate:	**27.60**

Avg. Hourly Uncontrolled Flash Rate (SCF/Hr)	=	Oil Rate * GOR	=	**11.50**
Avg. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Flash Gas Gravity * Density of Air * Flash Rate	=	**1.33**
Max. Hourly Controlled Total Flash Emissions (lb/hr)	=	Avg. Emissions * Ratio of Max. Oil Rate to Avg. Oil Rate	=	**1.33**
Annual Potential Uncontrolled Flash Emissions (TPY)	=	Hourly * 8760/2000	=	**5.83**

SPECIATION FACTORS:

Speciation of the flash gas mixture taken from the referenced laboratory results and normalized to account for the presence of H_2S; refer to Southern Petroleum Laboratories Report No.: 23080182-006A in ensuing pages.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.7591	0.0101	0.0101	0.0442
Carbon Dioxide (excluded from VOC total)	81.7594	1.0868	1.0868	4.7628
Methane (excluded from VOC total)	1.1517	0.0153	0.0153	0.0671
Ethane (excluded from VOC total)	2.5637	0.0341	0.0341	0.1493
Hydrogen Sulfide (excluded from VOC total)	0.0012	0.0000	0.0000	0.0001
Propane	4.1546	0.0552	0.0552	0.2420
Iso-Butane	1.7339	0.0230	0.0230	0.1010
N-Butane	2.8758	0.0382	0.0382	0.1675
Iso-Pentane	1.7380	0.0231	0.0231	0.1012
N-Pentane	1.0902	0.0145	0.0145	0.0635
Iso-Hexane	0.8642	0.0115	0.0115	0.0503
N-Hexane (TAP)	0.4851	0.0064	0.0064	0.0283
Methylcyclopentane	0.1534	0.0020	0.0020	0.0089
Benzene (TAP)	0.0427	0.0006	0.0006	0.0025
Cyclohexane	0.1515	0.0020	0.0020	0.0088
Heptanes	0.2740	0.0036	0.0036	0.0160
Methylcyclohexane	0.0649	0.0009	0.0009	0.0038
Toluene (TAP)	0.0126	0.0002	0.0002	0.0007
2,2,4-Trimethylpentane (TAP)	0.0521	0.0007	0.0007	0.0030
Octanes	0.0286	0.0004	0.0004	0.0017
Ethylbenzene (TAP)	0.0000	0.0000	0.0000	0.0000
Xylenes (TAP)	0.0048	0.0001	0.0001	0.0003
Nonanes	0.0351	0.0005	0.0005	0.0020
Decanes Plus	0.0032	0.0000	0.0000	0.0002
Total Weight Percent:	100.0000			
Total TAP Emissions		0.01	0.01	0.03
Total VOC Emissions		**0.18**	**0.18**	**0.80**
Total Non VOC & Non TAP-HC		0.05	0.05	0.22
Total Emissions		1.33	1.33	5.83

DATA:

Emission Source:	***Blanket Gas***
Average Annual Tank Throughput (BBLs/Yr):	***3,650,000***
Gross Blanket Gas Required (MSCF/Yr):	***20,495***
Gas from Process to Tank(s) (MSCF/Yr):	***1,926***
Calculated Volume Requirement (MSCF/Yr):	***18,569***
Net Blanket Gas Supplied (MSCF/Yr):	***18,569***
Maximum Hourly Fill Rate (BBLs/Hr):	***625***
Blanket Gas Specific Gravity: ***(based on an actual wet gas analysis)***	***1.4172***
Basis of Estimates:	***Manufacturers Gas Consumption Data & Actual Wet Gas Analysis***

Avg. Hourly Uncontrolled Emissions (lb/hr)	=	Annual Gas Rate/8760 * 0.0764 * SG	=	**229.51**
Max. Hourly Uncontrolled Emissions (lb/hr)	=	Max. Fill Rate * 42/7.48 * 0.0764 * SG	=	**379.97**
Annual Potential Uncontrolled Emissions (TPY)	=	Annual Gas Rate * 0.0764 * SG/2000	=	**1005.27**

SPECIATION FACTORS:

Speciation of the blanket gas is based on an actual wet gas analysis and normalized to account for the presence of H_2S; refer to Southern Petroleum Laboratories Report No.: 172-23080182-003A in ensuing pages.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.1196	0.2745	0.4545	1.2025
Carbon Dioxide (excluded from VOC total)	92.3491	211.9540	350.9012	928.3585
Methane (excluded from VOC total)	4.1413	9.5049	15.7358	41.6313
Ethane (excluded from VOC total)	1.0647	2.4435	4.0454	10.7027
Hydrogen Sulfide (excluded from VOC total)	0.0013	0.0030	0.0050	0.0133
Propane	0.6228	1.4295	2.3666	6.2610
Iso-Butane	0.2073	0.4758	0.7877	2.0841
N-Butane	0.3370	0.7735	1.2805	3.3877
Iso-Pentane	0.2319	0.5322	0.8811	2.3312
N-Pentane	0.1573	0.3610	0.5977	1.5812
Iso-Hexane	0.1692	0.3884	0.6429	1.7010
N-Hexane (TAP)	0.0816	0.1872	0.3099	0.8199
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.0395	0.0907	0.1502	0.3974
Cyclohexane	0.0561	0.1288	0.2132	0.5640
Heptanes	0.1548	0.3553	0.5883	1.5563
Methylcyclohexane	0.0666	0.1530	0.2532	0.6700
Toluene (TAP)	0.0170	0.0391	0.0647	0.1713
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.0806	0.1850	0.3062	0.8102

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Ethylbenzene (TAP)	0.0013	0.0030	0.0049	0.0130
Xylenes (TAP)	0.0114	0.0261	0.0432	0.1143
Nonanes	0.0646	0.1482	0.2454	0.6493
Decanes Plus	0.0249	0.0572	0.0947	0.2506
Total Weight Percent:	100.0000			
Total TAP Emissions		0.35	0.58	1.53
Total VOC Emissions		**5.33**	**8.83**	**23.36**
Total Non VOC & Non TAP-HC		11.95	19.78	52.33
Total Emissions		229.51	379.97	1005.27

VOC Emission Total (TPY)	=	Storage Vapors + Brine Flash + Oil Flash + Blanket Gas	=	**35.64**

Emission Calculations

POINT SOURCE I.D. NUMBER: *5a-07-WST-CV*

EMISSION SOURCE DESCRIPTION: *5000 BBL Produced Water Tank-Common Vent (ABJ-129A)*

DATA:

Emission Source:	***Water Storage Vapors ('Working' & 'Standing')***
Average Daily Water Throughput: **(Annual Average; BBLD - Q_{avg})**	***10,000***
Maximum Daily Water Throughput: **(BBLD - Q_{max})**	***10,000***
Average VOC Working Losses - L_W (lb/yr):	***3,698.685***
Average VOC Standing Losses - L_S (lb/yr):	***398.002***
Basis of Estimates:	***AP-42, Chapter 7 (June 2020, Section 7.1.3.1); Refer to ensuing pages for summary***

Avg. Hourly Uncontrolled THC Losses (lb/hr)	= (Lw + Ls) * 1.134/8760	=	**0.53**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**0.53**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**2.32**

SPECIATION FACTORS:

Speciation factors were taken from "Air Emissions Species Manual - Volume I: Volatile Organic Compound Species Profiles", 2nd edition; Report No.: EPA-450/2-90-001a; page 258 and normalized to account for the presence of H_2S; reference ensuing pages.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Hydrogen Sulfide (excluded from VOC total)	0.0011	0.0000	0.0000	0.0000
Methane (excluded from VOC total)	6.1996	0.0329	0.0329	0.1440
Ethane (excluded from VOC total)	5.5995	0.0297	0.0297	0.1301
Propane	17.6001	0.0933	0.0933	0.4088
Iso-Butane	1.5005	0.0080	0.0080	0.0349
N-Butane	27.1000	0.1437	0.1437	0.6295
Iso-Pentane	1.4996	0.0080	0.0080	0.0348
N-Pentane	14.5995	0.0774	0.0774	0.3391
Heptane	9.2003	0.0488	0.0488	0.2137
Octane	6.8994	0.0366	0.0366	0.1603
Other NM/NE Hydrocarbons	1.7994	0.0095	0.0095	0.0418

N-Hexane (TAP)	7.9006	0.0419	0.0419	0.1835
Benzene (TAP)	0.1005	0.0005	0.0005	0.0023
Total Weight Percent:	100.0000			
Total TAP Emissions		0.04	0.04	0.19
Total VOC Emissions		**0.47**	**0.47**	**2.05**
Total Non VOC & Non TAP-HC		0.06	0.06	0.27
Total Hydrocarbon Emissions		0.53	0.53	2.32

DATA:

Emission Source:	***Blanket Gas***
Average Annual Tank Throughput (BBLs/Yr):	***3,650,000***
Gross Blanket Gas Required (MSCF/Yr):	***20,495***
Gas from Process to Tank(s) (MSCF/Yr):	***0***
Calculated Volume Requirement (MSCF/Yr):	***20,495***
Net Blanket Gas Supplied (MSCF/Yr):	***20,495***
Maximum Hourly Fill Rate (BBLs/Hr):	***625***
Blanket Gas Specific Gravity: ***(based on an actual wet gas analysis)***	***1.4172***
Basis of Estimates:	***Manufacturers Gas Consumption Data & Actual Wet Gas Analysis***

Avg. Hourly Uncontrolled Emissions (lb/hr)	=	Annual Gas Rate/8760 * 0.0764 * SG	=	**253.32**
Max. Hourly Uncontrolled Emissions (lb/hr)	=	Max. Fill Rate * 42/7.48 * 0.0764 * SG	=	**379.97**
Annual Potential Uncontrolled Emissions (TPY)	=	Annual Gas Rate * 0.0764 * SG/2000	=	**1109.54**

SPECIATION FACTORS:

Speciation of the blanket gas is based on an actual wet gas analysis and normalized to account for the presence of H_2S; refer to Southern Petroleum Laboratories Report No.: 172-23080182-003A in ensuing pages.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.1196	0.3030	0.4545	1.3272
Carbon Dioxide (excluded from VOC total)	92.3491	233.9381	350.9012	1024.6490
Methane (excluded from VOC total)	4.1413	10.4907	15.7358	45.9494
Ethane (excluded from VOC total)	1.0647	2.6970	4.0454	11.8127
Hydrogen Sulfide (excluded from VOC total)	0.0013	0.0034	0.0050	0.0147
Propane	0.6228	1.5777	2.3666	6.9104
Iso-Butane	0.2073	0.5252	0.7877	2.3003
N-Butane	0.3370	0.8537	1.2805	3.7391
Iso-Pentane	0.2319	0.5874	0.8811	2.5730
N-Pentane	0.1573	0.3984	0.5977	1.7452
Iso-Hexane	0.1692	0.4286	0.6429	1.8774
N-Hexane (TAP)	0.0816	0.2066	0.3099	0.9050

Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.0395	0.1001	0.1502	0.4386
Cyclohexane	0.0561	0.1421	0.2132	0.6225
Heptanes	0.1548	0.3922	0.5883	1.7177
Methylcyclohexane	0.0666	0.1688	0.2532	0.7395
Toluene (TAP)	0.0170	0.0432	0.0647	0.1890
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.0806	0.2042	0.3062	0.8942
Ethylbenzene (TAP)	0.0013	0.0033	0.0049	0.0143
Xylenes (TAP)	0.0114	0.0288	0.0432	0.1261
Nonanes	0.0646	0.1636	0.2454	0.7167
Decanes Plus	0.0249	0.0631	0.0947	0.2765
Total Weight Percent:	100.0000			
Total TAP Emissions		0.39	0.58	1.69
Total VOC Emissions		**5.89**	**8.83**	**25.79**
Total Non VOC & Non TAP-HC		13.19	19.78	57.76
Total Emissions		253.32	379.97	1109.54

VOC Emission Total (TPY)	=	Storage Vapors + Blanket Gas	=	**27.84**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***6-07-SEP-V***

EMISSION SOURCE DESCRIPTION: ***API Separator-Vent (ZZZ-128)***

DATA:

Emission Source:	***Crude Oil Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD - Q_{avg})**	***20***
Maximum Daily Oil Throughput: **(BBLD - Q_{max})**	***20***
Average VOC Working Losses - L_W (lb/yr):	***1,246.194***
Average VOC Standing Losses - L_S (lb/yr):	***4,260.431***
Basis of Estimates:	***AP-42, Chapter 7 (June 2020, Section 7.1.3.1); Refer to ensuing pages for summary***

Avg. Hourly Uncontrolled THC Losses (lb/hr)	= (Lw + Ls) * 1.134/8760	=	**0.71**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**0.71**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**3.12**

SPECIATION FACTORS:

Speciation factors were taken from "Air Emissions Species Manual - Volume I: Volatile Organic Compound Species Profiles", 2nd edition; Report No.: EPA-450/2-90-001a; page 258 and normalized to account for the presence of H_2S; reference ensuing pages.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Hydrogen Sulfide (excluded from VOC total)	0.0011	0.0000	0.0000	0.0000
Methane (excluded from VOC total)	6.1996	0.0442	0.0442	0.1936
Ethane (excluded from VOC total)	5.5995	0.0399	0.0399	0.1748
Propane	17.6001	0.1255	0.1255	0.5495
Iso-Butane	1.5005	0.0107	0.0107	0.0468
N-Butane	27.1000	0.1932	0.1932	0.8461
Iso-Pentane	1.4996	0.0107	0.0107	0.0468
N-Pentane	14.5995	0.1041	0.1041	0.4558
Heptane	9.2003	0.0656	0.0656	0.2873
Octane	6.8994	0.0492	0.0492	0.2154
Other NM/NE Hydrocarbons	1.7994	0.0128	0.0128	0.0562

N-Hexane (TAP)	7.9006	0.0563	0.0563	0.2467
Benzene (TAP)	0.1005	0.0007	0.0007	0.0031
Total Weight Percent:	100.0000			
Total TAP Emissions		0.06	0.06	0.25
Total VOC Emissions		**0.63**	**0.63**	**2.75**
Total Non VOC & Non TAP-HC		0.08	0.08	0.37
Total Hydrocarbon Emissions		0.71	0.71	3.12

VOC Emission Total (TPY)	=	Storage Vapors	=	**2.75**

Emission Calculations

Emission calculations shown below are presented for informational purposes only as vapors from the API oil disposal tank are routed to the atmospheric control flare (EPN: 11-07-F) for combustion, except during brief intervals when thief hatches are opened for purposes of sampling, gauging, etc.

POINT SOURCE I.D. NUMBER: ***7a-07-OST-CV***

EMISSION SOURCE DESCRIPTION: ***400 BBL API Oil Disposal Tank-Common Vent (ABJ-108)***

DATA:

Emission Source:	***Crude Oil Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD - Q_{avg})**	***20***
Maximum Daily Oil Throughput: **(BBLD - Q_{max})**	***20***
Average VOC Working Losses - L_W (lb/yr):	***1,241.739***
Average VOC Standing Losses - L_S (lb/yr):	***989.409***
Basis of Estimates:	***AP-42, Chapter 7 (June 2020, Section 7.1.3.1); Refer to ensuing pages for summary***

Avg. Hourly Uncontrolled THC Losses (lb/hr)	= (Lw + Ls) * 1.134/8760	=	**0.29**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**0.29**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**1.27**

SPECIATION FACTORS:

Speciation factors were taken from "Air Emissions Species Manual - Volume I: Volatile Organic Compound Species Profiles", 2nd edition; Report No.: EPA-450/2-90-001a; page 258 and normalized to account for the presence of H_2S; reference ensuing pages.

UNCONTROLLED EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Hydrogen Sulfide (excluded from VOC total)	0.0011	0.0000	0.0000	0.0000
Methane (excluded from VOC total)	6.1996	0.0179	0.0179	0.0784
Ethane (excluded from VOC total)	5.5995	0.0162	0.0162	0.0708
Propane	17.6001	0.0508	0.0508	0.2227
Iso-Butane	1.5005	0.0043	0.0043	0.0190
N-Butane	27.1000	0.0783	0.0783	0.3428
Iso-Pentane	1.4996	0.0043	0.0043	0.0190
N-Pentane	14.5995	0.0422	0.0422	0.1847
Heptane	9.2003	0.0266	0.0266	0.1164
Octane	6.8994	0.0199	0.0199	0.0873
Other NM/NE Hydrocarbons	1.7994	0.0052	0.0052	0.0228

N-Hexane (TAP)	7.9006	0.0228	0.0228	0.0999
Benzene (TAP)	0.1005	0.0003	0.0003	0.0013
Total TAP Emissions		0.02	0.02	0.10
Total VOC Emissions		**0.25**	**0.25**	**1.12**
Total Non VOC & Non TAP-HC		0.03	0.03	0.15
Total Hydrocarbon Emissions		0.29	0.29	1.27

DATA:

Emission Source:	***Blanket Gas***
Maximum Annula Tank Throughput (BBLs/Yr):	***7,300***
Gross Blanket Gas Required (MSCF/Yr):	***41***
Gas from Process to Tank(s) (MSCF/Yr):	***0***
Calculated Volume Requirement (MSCF/Yr):	***41***
Net Blanket Gas Supplied (MSCF/Yr):	***41***
Maximum Hourly Fill Rate (BBLs/Hr):	***1***
Blanket Gas Specific Gravity: ***(based on an actual wet gas analysis)***	***1.4172***
Basis of Estimates:	***Manufacturers Gas Consumption Data & Actual Wet Gas Analysis***

Avg. Hourly Uncontrolled Emissions (lb/hr)	=	Annual Gas Rate/8760 * 0.0764 * SG	=	**0.51**
Max. Hourly Uncontrolled Emissions (lb/hr)	=	Max. Fill Rate * 42/7.48 * 0.0764 * SG	=	**0.61**
Annual Potential Uncontrolled Emissions (TPY)	=	Annual Gas Rate * 0.0764 * SG/2000	=	**2.22**

SPECIATION FACTORS:

Speciation of the blanket gas is based on an actual wet gas analysis and normalized to account for the presence of H_2S; refer to Southern Petroleum Laboratories Report No.: 172-23080182-003A in ensuing pages.

UNCONTROLLED EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.1196	0.0006	0.0007	0.0027
Carbon Dioxide (excluded from VOC total)	92.3491	0.4680	0.5614	2.0498
Methane (excluded from VOC total)	4.1413	0.0210	0.0252	0.0919
Ethane (excluded from VOC total)	1.0647	0.0054	0.0065	0.0236
Hydrogen Sulfide (excluded from VOC total)	0.0013	0.0000	0.0000	0.0000
Propane	0.6228	0.0032	0.0038	0.0138
Iso-Butane	0.2073	0.0011	0.0013	0.0046
N-Butane	0.3370	0.0017	0.0020	0.0075
Iso-Pentane	0.2319	0.0012	0.0014	0.0051
N-Pentane	0.1573	0.0008	0.0010	0.0035
Iso-Hexane	0.1692	0.0009	0.0010	0.0038
N-Hexane (TAP)	0.0816	0.0004	0.0005	0.0018
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000

Benzene (TAP)	0.0395	0.0002	0.0002	0.0009
Cyclohexane	0.0561	0.0003	0.0003	0.0012
Heptanes	0.1548	0.0008	0.0009	0.0034
Methylcyclohexane	0.0666	0.0003	0.0004	0.0015
Toluene (TAP)	0.0170	0.0001	0.0001	0.0004
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.0806	0.0004	0.0005	0.0018
Ethylbenzene (TAP)	0.0013	0.0000	0.0000	0.0000
Xylenes (TAP)	0.0114	0.0001	0.0001	0.0003
Nonanes	0.0646	0.0003	0.0004	0.0014
Decanes Plus	0.0249	0.0001	0.0002	0.0006
Total Weight Percent:	100.0000			
Total TAP Emissions		0.00	0.00	0.00
Total VOC Emissions		**0.01**	**0.01**	**0.05**
Total Non VOC & Non TAP-HC		0.03	0.03	0.12
Total Emissions		0.51	0.61	2.22

Uncontrolled VOC Emission Total (TPY)	Storage Vapors + Blanket Gas	=	**1.17**

DATA:

Emission Source:	***Losses When Opening Thief Hatches***
Specific Gravity of Gas:	***1.4172***
Maximum Thief Hatch Venting (Hrs/Yr) **(Under Normal/Routine Operating Conditions)**	***30***
Max. Minutes a Hatch is Opened in a Single Hour:	***5***
Maximum Hourly Emission Rate (lb/hr): **(from preceding tank emission estimates)**	***0.08***

Avg. Hourly Emissions (lb/hr)	=	Annual/8760 (hrs/yr)	=	**0.00**
Maximum Hourly Emissions (lb/hr)	=	Max. Emission Rate * Max. Minutes/Hr Hatch is Open	=	**0.08**
Maximum Annual Emissions (TPY)	=	Max. Hourly THC Rate * Hours/Yr Hatch is Open	=	**0.01**

EMISSION SUMMARY (based on the above referenced actual wet gas analysis):

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.1196	0.000	0.000	0.000
Carbon Dioxide (excluded from VOC total)	92.3491	0.002	0.074	0.013
Methane (excluded from VOC total)	4.1413	0.000	0.003	0.001
Ethane (excluded from VOC total)	1.0647	0.000	0.001	0.000
Hydrogen Sulfide (excluded from VOC total)	0.0013	0.000	0.000	0.000
Propane	0.6228	0.000	0.000	0.000
Iso-Butane	0.2073	0.000	0.000	0.000
N-Butane	0.3370	0.000	0.000	0.000
Iso-Pentane	0.2319	0.000	0.000	0.000

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
N-Pentane	0.1573	0.000	0.000	0.000
Iso-Hexane	0.1692	0.000	0.000	0.000
N-Hexane (TAP)	0.0816	0.000	0.000	0.000
Methylcyclopentane	0.0000	0.000	0.000	0.000
Benzene (TAP)	0.0395	0.000	0.000	0.000
Cyclohexane	0.0561	0.000	0.000	0.000
Heptanes	0.1548	0.000	0.000	0.000
Methylcyclohexane	0.0666	0.000	0.000	0.000
Toluene (TAP)	0.0170	0.000	0.000	0.000
2,2,4-Trimethylpentane (TAP)	0.0000	0.000	0.000	0.000
Octanes	0.0806	0.000	0.000	0.000
Ethylbenzene (TAP)	0.0013	0.000	0.000	0.000
Xylenes (TAP)	0.0114	0.000	0.000	0.000
Nonanes	0.0646	0.000	0.000	0.000
Decanes Plus	0.0249	0.000	0.000	0.000
Other NM/NE HC	0.0000	0.000	0.000	0.000
Total Weight Percent:	100.0000			
Total TAP Emissions		0.00	0.00	0.00
Total VOC Emissions		**0.00**	**0.00**	**0.00**
Total Non VOC & Non TAP-HC		0.00	0.00	0.00
Total Emissions		0.00	0.08	0.01

Emission Calculations

POINT SOURCE I.D. NUMBER: *7b-07-WST-CV*

EMISSION SOURCE DESCRIPTION: *400 BBL API Water Disposal Tank-Common Vent (ABM-165A)*

DATA:

Emission Source:	***Water Storage Vapors ('Working' & 'Standing')***
Average Daily Water Throughput: **(Annual Average; BBLD - Q_{avg})**	***400***
Maximum Daily Water Throughput: **(BBLD - Q_{max})**	***400***
Average VOC Working Losses - L_W (lb/yr):	***172.211***
Average VOC Standing Losses - L_S (lb/yr):	***32.018***
Basis of Estimates:	***AP-42, Chapter 7 (June 2020, Section 7.1.3.1); Refer to ensuing pages for summary***

Avg. Hourly Uncontrolled THC Losses (lb/hr)	= (Lw + Ls) * 1.134/8760	=	**0.03**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**0.03**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**0.12**

SPECIATION FACTORS:

Speciation factors were taken from "Air Emissions Species Manual - Volume I: Volatile Organic Compound Species Profiles", 2nd edition; Report No.: EPA-450/2-90-001a; page 258 and normalized to account for the presence of H_2S; reference ensuing pages.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Hydrogen Sulfide (excluded from VOC total)	0.0011	0.0000	0.0000	0.0000
Methane (excluded from VOC total)	6.1996	0.0016	0.0016	0.0072
Ethane (excluded from VOC total)	5.5995	0.0015	0.0015	0.0065
Propane	17.6001	0.0047	0.0047	0.0204
Iso-Butane	1.5005	0.0004	0.0004	0.0017
N-Butane	27.1000	0.0072	0.0072	0.0314
Iso-Pentane	1.4996	0.0004	0.0004	0.0017
N-Pentane	14.5995	0.0039	0.0039	0.0169
Heptane	9.2003	0.0024	0.0024	0.0107
Octane	6.8994	0.0018	0.0018	0.0080
Other NM/NE Hydrocarbons	1.7994	0.0005	0.0005	0.0021

N-Hexane (TAP)	7.9006	0.0021	0.0021	0.0091
Benzene (TAP)	0.1005	0.0000	0.0000	0.0001
Total Weight Percent:	100.0000			
Total TAP Emissions		0.00	0.00	0.01
Total VOC Emissions		**0.02**	**0.02**	**0.10**
Total Non VOC & Non TAP-HC		0.00	0.00	0.01
Total Hydrocarbon Emissions		0.03	0.03	0.12

DATA:

Emission Source:	***Blanket Gas***
Average Annual Tank Throughput (BBLs/Yr):	***146,000***
Gross Blanket Gas Required (MSCF/Yr):	***820***
Gas from Process to Tank(s) (MSCF/Yr):	***0***
Calculated Volume Requirement (MSCF/Yr):	***820***
Net Blanket Gas Supplied (MSCF/Yr):	***820***
Maximum Hourly Fill Rate (BBLs/Hr):	***17***
Blanket Gas Specific Gravity: *(based on an actual wet gas analysis)*	***1.4172***
Basis of Estimates:	***Manufacturers Gas Consumption Data & Actual Wet Gas Analysis***

Avg. Hourly Uncontrolled Emissions (lb/hr)	=	Annual Gas Rate/8760 Hrs/Yr * 0.0764 * SG	=	**10.14**
Max. Hourly Uncontrolled Emissions (lb/hr)	=	Max. Fill Rate * 42/7.48 * 0.0764 * SG	=	**10.34**
Annual Potential Uncontrolled Emissions (TPY)	=	Annual Gas Rate * 0.0764 * SG/2000	=	**44.39**

SPECIATION FACTORS:

Speciation of the blanket gas is based on an actual wet gas analysis and normalized to account for the presence of H_2S; refer to Southern Petroleum Laboratories Report No.: 172-23080182-003A in ensuing pages.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.1196	0.0121	0.0124	0.0531
Carbon Dioxide (excluded from VOC total)	92.3491	9.3598	9.5445	40.9960
Methane (excluded from VOC total)	4.1413	0.4197	0.4280	1.8384
Ethane (excluded from VOC total)	1.0647	0.1079	0.1100	0.4726
Hydrogen Sulfide (excluded from VOC total)	0.0013	0.0001	0.0001	0.0006
Propane	0.6228	0.0631	0.0644	0.2765
Iso-Butane	0.2073	0.0210	0.0214	0.0920
N-Butane	0.3370	0.0342	0.0348	0.1496
Iso-Pentane	0.2319	0.0235	0.0240	0.1029
N-Pentane	0.1573	0.0159	0.0163	0.0698
Iso-Hexane	0.1692	0.0171	0.0175	0.0751
N-Hexane (TAP)	0.0816	0.0083	0.0084	0.0362
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000

Benzene (TAP)	0.0395	0.0040	0.0041	0.0175
Cyclohexane	0.0561	0.0057	0.0058	0.0249
Heptanes	0.1548	0.0157	0.0160	0.0687
Methylcyclohexane	0.0666	0.0068	0.0069	0.0296
Toluene (TAP)	0.0170	0.0017	0.0018	0.0076
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.0806	0.0082	0.0083	0.0358
Ethylbenzene (TAP)	0.0013	0.0001	0.0001	0.0006
Xylenes (TAP)	0.0114	0.0012	0.0012	0.0050
Nonanes	0.0646	0.0065	0.0067	0.0287
Decanes Plus	0.0249	0.0025	0.0026	0.0111
Total Weight Percent:	100.0000			
Total TAP Emissions		0.02	0.02	0.07
Total VOC Emissions		**0.24**	**0.24**	**1.03**
Total Non VOC & Non TAP-HC		0.53	0.54	2.31
Total Emissions		10.14	10.34	44.39

VOC Emission Total (TPY)	=	Storage Vapors + Blanket Gas	=	**1.13**

Emission Calculations

Emission calculations shown below are presented for informational purposes only as vapors from the inhibitor oil blending tanks are routed to the atmospheric control flare (EPN: 11-07-F) for combustion, except during brief intervals when thief hatches are opened for purposes of sampling, gauging, etc.

POINT SOURCE I.D. NUMBER: ***8-07-IOT-V***

EMISSION SOURCE DESCRIPTION: ***1500 BBL Inhibitor Oil Blending Tank-Vent (BBJ-133A)***

DATA:

Emission Source:	***Crude Oil Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD/Tank - Q_{avg})**	***125***
Maximum Daily Oil Throughput: **(BBLD/Tank - Q_{max})**	***250***
Average VOC Working Losses - L_w (lb/yr):	***7,791.733***
Average VOC Standing Losses - L_S (lb/yr):	***3,343.250***
Basis of Estimates:	***AP-42, Chapter 7 (June 2020, Section 7.1.3.1); Refer to ensuing pages for summary***

Avg. Hourly Uncontrolled THC Losses (lb/hr)	= (Lw + Ls) * 1.134/8760	=	**1.44**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**2.45**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**6.31**

SPECIATION FACTORS:

Speciation factors were taken from "Air Emissions Species Manual - Volume I: Volatile Organic Compound Species Profiles", 2nd edition; Report No.: EPA-450/2-90-001a; page 258 and normalized to account for the presence of H_2S; reference ensuing pages.

UNCONTROLLED EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Hydrogen Sulfide (excluded from VOC total)	0.0011	0.0000	0.0000	0.0001
Methane (excluded from VOC total)	6.1996	0.0894	0.1519	0.3914
Ethane (excluded from VOC total)	5.5995	0.0807	0.1372	0.3535
Propane	17.6001	0.2537	0.4312	1.1112
Iso-Butane	1.5005	0.0216	0.0368	0.0947
N-Butane	27.1000	0.3906	0.6640	1.7110
Iso-Pentane	1.4996	0.0216	0.0367	0.0947
N-Pentane	14.5995	0.2104	0.3577	0.9217
Heptane	9.2003	0.1326	0.2254	0.5809
Octane	6.8994	0.0995	0.1690	0.4356

Other NM/NE Hydrocarbons	1.7994	0.0259	0.0441	0.1136
N-Hexane (TAP)	7.9006	0.1139	0.1936	0.4988
Benzene (TAP)	0.1005	0.0014	0.0025	0.0063
Total TAP Emissions		0.12	0.20	0.51
Total VOC Emissions		**1.27**	**2.16**	**5.57**
Total Non VOC & Non TAP-HC		0.17	0.29	0.74
Total Hydrocarbon Emissions		1.44	2.45	6.31

Calculated Avg. Gas Flowrate (SCFH) =	*10.66*

The mixing station blends chemicals in various combinations. When the word "solution" is used it is intended to indicate a mixture of various chemicals. Total material use indicated below:

Chemical Material	Specific Gravity	True Vapor Pressure (psia)	Throughput (gallons/year)
Corrosion Inhibitor	0.936	0.10	6,000
Paraffin Inhibitor	0.880	N/A	1,000
Asphaltine Inhibitor	0.93	0.20	750
Produced Oil	1.7685	3.36	1,916,250
Total Throughput (gallons/yr) =			1,924,000

EPA document 745-R-99-005 entitled "Look-up Tables for Estimating Toxic Release Inventory Air Emissions from Chemical Distribution Facilities" was used for determining the emissions during the mixing process and the emissions from the transfer of product to the final transport container; refer to ensuing pages for copy.

Chemical Material #1:		**Corrosion Inhibitor**			
CHEMICAL USAGE				**CHEMICAL THROUGHPUT**	
Gallons/Year	**Hour/Year**	**Specific Gravity**		**Hourly (lb/hr)**	**Annual (TPY)**
6,000	8,760	0.936		5.35	23.42
Emission Factors*					
A_1	A_2	A_5	A_6	*Throughput Factor (lb/yr)*	*City Factor*
34	*1*	*34*	*1*	*50,000*	*1.31*
A_1 (lb/yr) = 41.72		A_2 (lb/yr) = 1.23		A_5 (lb/yr) = 41.72	A_6 (lb/yr) = 1.23
				Total ΣTPY=	0.04

POLLUTANT:**	**Weight Percent**	**CALCULATED EMISSION RATES**	
		Hourly (lb/hr)	**Annual (TPY)**
VOCs	100.00	0.0098	0.0429
Total Weight Percent:	100.00		
Total TAP Emissions		0.01	0.04
Total VOC Emissions		**0.01**	**0.04**
Total Non VOC & Non TAP-HC		0.00	0.00
Total Emissions		0.01	0.04

**EPA document 745-R-99-005 entitled "Look-up Tables for Estimating Toxic Release Inventory Air Emissions from Chemical Distribution Facilities" was used for determining the emissions; refer to ensuing pages for copy.*

***HAP-Hazardous/Toxic Air Pollutant (listing taken from LAC 33:III.5112)*

NOTE: Emission factors for n-Hexane were used since the above solution is not listed in the EPA document and both are believed to have similar evaporation rates.

Chemical Material #2:		Paraffin Inhibitor			
CHEMICAL USAGE				CHEMICAL THROUGHPUT	
Gallons/Year		Hour/Year	Specific Gravity	Hourly (lb/hr)	Annual (TPY)
1,000		8,760	0.880	0.84	3.67
Emission Factors*					
A_1	A_2	A_5	A_6	*Throughput (lb/yr)*	*City Factor*
34	*1*	*34*	*1*	*50,000*	*1.31*
A_1 (lb/yr) = 6.54		A_2 (lb/yr) = 0.19		A_5 (lb/yr) = 6.54	A_6 (lb/yr) = 0.19
				Total ΣTPY=	0.01

POLLUTANT:**	Weight Percent	CALCULATED EMISSION RATES	
		Hourly (lb/hr)	Annual (TPY)
1,2,4-Trimethylbenzene	10.00	0.0002	0.0007
1,2,3-Trimethylbenzene	5.00	0.0001	0.0003
1,3,5-Trimethylbenzene	5.00	0.0001	0.0003
Light Aromatic Naphtha	20.00	0.0003	0.0013
Xylenes (TAP)	50.00	0.0008	0.0034
Ethylbenzene (TAP)	10.00	0.0002	0.0007
Total Weight Percent:	100.00		
Total TAP Emissions		0.00	0.00
Total VOC Emissions		**0.00**	**0.01**
Total Non VOC & Non TAP-HC		0.00	0.00
Total Emissions		0.00	0.01

**EPA document 745-R-99-005 entitled "Look-up Tables for Estimating Toxic Release Inventory Air Emissions from Chemical Distribution Facilities" was used for determining the emissions; refer to ensuing pages for copy.*

***HAP-Hazardous/Toxic Air Pollutant (listing taken from LAC 33:III.5112)*

NOTE: Emission factors for n-Hexane were used since the above solution is not listed in the EPA document and both are believed to have similar evaporation rates.

Chemical Material #3:		Asphaltine Inhibitor			
CHEMICAL USAGE				CHEMICAL THROUGHPUT	
Gallons/Year		Hour/Year	Specific Gravity	Hourly (lb/hr)	Annual (TPY)
750		8,760	0.93	0.66	2.91
Emission Factors*					
A_1	A_2	A_5	A_6	*Throughput (lb/yr)*	*City Factor*
34	*1*	*34*	*1*	*50,000*	*1.31*
A_1 (lb/yr) = 5.18		A_2 (lb/yr) = 0.15		A_5 (lb/yr) = 5.18	A_6 (lb/yr) = 0.15
				Total ΣTPY=	0.01

POLLUTANT:**	Weight Percent	CALCULATED EMISSION RATES	
		Hourly (lb/hr)	Annual (TPY)
1,2,4-Trimethylbenzene	18.00	0.0002	0.0010
1,2,3-Trimethylbenzene	3.00	0.0000	0.0002
1,3,5-Trimethylbenzene	3.00	0.0000	0.0002
Light Aromatic Naphtha	18.00	0.0002	0.0010
Polymer	37.00	0.0005	0.0020

Triethylenetetramine	3.00	0.0000	0.0002
Toluene (TAP)	18.00	0.0002	0.0010
Total Weight Percent:	100.00		
Total TAP Emissions		0.00	0.00
Total VOC Emissions		**0.00**	**0.01**
Total Non VOC & Non TAP-HC		0.00	0.00
Total Emissions		0.00	0.01

**EPA document 745-R-99-005 entitled "Look-up Tables for Estimating Toxic Release Inventory Air Emissions from Chemical Distribution Facilities" was used for determining the emissions; refer to ensuing pages for copy.*

***HAP-Hazardous/Toxic Air Pollutant (listing taken from LAC 33:III.5112)*

NOTE: Emission factors for n-Hexane were used since the above solution is not listed in the EPA document and both are believed to have similar evaporation rates.

Chemical Material #4:		**Produced Oil**			
CHEMICAL USAGE				**CHEMICAL THROUGHPUT**	
Gallons/Year	**Hour/Year**	**Specific Gravity**		**Hourly (lb/hr)**	**Annual (TPY)**
1,916,250	8,760	1.7685		3226.41	14131.66
Emission Factors*					
A_1	A_2	A_5	A_6	*Throughput (lb)*	*City Factor*
6794	*112*	*2253*	*111*	*10,000,000*	*1.31*
A_1 (lb/yr) = 25154.76		A_2 (lb/yr) = 414.68		A_5 (lb/yr) = 8,341.72	A_6 (lb/yr) = 410.98
				Total ΣTPY=	17.16

POLLUTANT:**	**Weight Percent**	**CALCULATED EMISSION RATES**	
		Hourly (lb/hr)	**Annual (TPY)**
Methane (excluded from VOC total)	6.1995	0.2429	1.0639
Ethane (excluded from VOC total)	5.5993	0.2194	0.9609
Carbon Dioxide (excluded from VOC total)	0.0000	0.0000	0.0000
Hydrogen Sulfide (excluded from VOC total)	0.0033	0.0001	0.0006
Propane	17.5997	0.6896	3.0203
Iso-Butane	1.5004	0.0588	0.2575
N-Butane	27.0994	1.0618	4.6505
Iso-Pentane	1.4996	0.0588	0.2573
N-Pentane	14.5991	0.5720	2.5054
Heptanes	9.2001	0.3605	1.5788
Octane	6.8992	0.2703	1.1840
Other NM/NE Hydrocarbons	1.7994	0.0705	0.3088

N-Hexane (TAP)	7.9004	0.3095	1.3558
Benzene (TAP)	0.1005	0.0039	0.0173
Total Weight Percent:	100.0000		
Total TAP Emissions		0.31	1.37
Total VOC Emissions		**3.46**	**15.14**
Total Non VOC & Non TAP-HC		0.46	2.03
Total Emissions		3.92	17.16

**EPA document 745-R-99-005 entitled "Look-up Tables for Estimating Toxic Release Inventory Air Emissions from Chemical Distribution Facilities" was used for determining the emissions; refer to ensuing pages for copy.*

***HAP-Hazardous/Toxic Air Pollutant (listing taken from LAC 33:III.5112)*

NOTE: Emission factors for n-Hexane were used since the above solution is not listed in the EPA document and both are believed to have similar evaporation rates.

DATA:

Emission Source:	***Blanket Gas***
Average Annual Tank Throughput (BBLs/Yr):	***45,625***
Gross Blanket Gas Required (MSCF/Yr):	***256***
Gas from Process to Tank(s) (MSCF/Yr):	***0***
Calculated Volume Requirement (MSCF/Yr):	***256***
Net Blanket Gas Supplied (MSCF/Yr):	***256***
Maximum Hourly Fill Rate (BBLs/Hr):	***10***
Blanket Gas Specific Gravity: ***(based on an actual wet gas analysis)***	***1.4172***
Basis of Estimates:	***Manufacturers Gas Consumption Data & Actual Wet Gas Analysis***

Avg. Hourly Uncontrolled Emissions (lb/hr)	=	Annual Gas Rate/8760 Hrs/Yr * 0.0764 * SG	=	**3.16**
Max. Hourly Uncontrolled Emissions (lb/hr)	=	Max. Fill Rate * 42/7.48 * 0.0764 * SG	=	**6.08**
Annual Potential Uncontrolled Emissions (TPY)	=	Annual Gas Rate * 0.0764 * SG/2000	=	**13.86**

SPECIATION FACTORS:

Speciation of the blanket gas is based on an actual wet gas analysis and normalized to account for the presence of H_2S; refer to Southern Petroleum Laboratories Report No.: 172-23080182-003A in ensuing pages.

UNCONTROLLED EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.1196	0.0038	0.0073	0.0166
Carbon Dioxide (excluded from VOC total)	92.3491	2.9221	5.6144	12.7987
Methane (excluded from VOC total)	4.1413	0.1310	0.2518	0.5739
Ethane (excluded from VOC total)	1.0647	0.0337	0.0647	0.1476
Hydrogen Sulfide (excluded from VOC total)	0.0013	0.0000	0.0001	0.0002
Propane	0.6228	0.0197	0.0379	0.0863
Iso-Butane	0.2073	0.0066	0.0126	0.0287

N-Butane	0.3370	0.0107	0.0205	0.0467
Iso-Pentane	0.2319	0.0073	0.0141	0.0321
N-Pentane	0.1573	0.0050	0.0096	0.0218
Iso-Hexane	0.1692	0.0054	0.0103	0.0235
N-Hexane (TAP)	0.0816	0.0026	0.0050	0.0113
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.0395	0.0013	0.0024	0.0055
Cyclohexane	0.0561	0.0018	0.0034	0.0078
Heptanes	0.1548	0.0049	0.0094	0.0215
Methylcyclohexane	0.0666	0.0021	0.0041	0.0092
Toluene (TAP)	0.0170	0.0005	0.0010	0.0024
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.0806	0.0026	0.0049	0.0112
Ethylbenzene (TAP)	0.0013	0.0000	0.0001	0.0002
Xylenes (TAP)	0.0114	0.0004	0.0007	0.0016
Nonanes	0.0646	0.0020	0.0039	0.0090
Decanes Plus	0.0249	0.0008	0.0015	0.0035
Total Weight Percent:	100.0000			
Total TAP Emissions		0.00	0.01	0.02
Total VOC Emissions		**0.07**	**0.14**	**0.32**
Total Non VOC & Non TAP-HC		0.16	0.32	0.72
Total Emissions		3.16	6.08	13.86

Uncontrolled VOC Emission Total (TPY)	Storage Vapors + Blending Emissions + Blanket Gas	=	**21.09**

DATA:

Emission Source:	***Losses When Opening Thief Hatches***
Specific Gravity of Gas:	***1.5112***
Maximum Thief Hatch Venting (Hrs) **(Under Normal/Routine Operating Conditions)**	***30***
Max. Minutes a Hatch is Opened in a Single Hr:	***5***
Maximum Hourly Emission Rate (lb/hr): **(from preceding tank emission estimates)**	***0.45***

Avg. Hourly Emissions (lb/hr)	=	Annual Total/8760 (hrs/yr)	=	**0.02**
Maximum Hourly Emissions (lb/hr)	=	Max. Emission Rate * Max. Minutes/Hr Hatch is Open	=	**0.45**
Maximum Annual Emissions (TPY)	=	Max. Hourly THC Rate * Hours/Yr Hatch is Open	=	**0.08**

EMISSION SUMMARY (based on weighted average of all streams contributing to tank emissions; refer to ensuing pages):				
POLLUTANT:	**Weight Percent**	**CALCULATED EMISSION RATES**		
		Average Hourly (lb/hr)	**Maximum Hourly (lb/hr)**	**Annual (TPY)**
Nitrogen (excluded from VOC total)	0.0822	0.000	0.000	0.000
Carbon Dioxide (excluded from VOC total)	63.4401	0.012	0.285	0.052
Methane (excluded from VOC total)	4.7856	0.001	0.022	0.004
Ethane (excluded from VOC total)	2.4842	0.000	0.011	0.002
Hydrogen Sulfide (excluded from VOC total)	0.0012	0.000	0.000	0.000
Propane	5.9373	0.001	0.027	0.005
Iso-Butane	0.6121	0.000	0.003	0.000
N-Butane	8.7148	0.002	0.039	0.007
Iso-Pentane	0.6287	0.000	0.003	0.001
N-Pentane	4.6782	0.001	0.021	0.004
Iso-Hexane	0.1162	0.000	0.001	0.000
N-Hexane (TAP)	2.5292	0.000	0.011	0.002
Methylcyclopentane	0.0000	0.000	0.000	0.000
Benzene (TAP)	0.0586	0.000	0.000	0.000
Cyclohexane	0.0385	0.000	0.000	0.000
Heptanes	2.9864	0.001	0.013	0.002
Methylcyclohexane	0.0458	0.000	0.000	0.000
Toluene (TAP)	0.0117	0.000	0.000	0.000
2,2,4-Trimethylpentane (TAP)	0.0000	0.000	0.000	0.000
Octanes	2.2154	0.000	0.010	0.002
Ethylbenzene (TAP)	0.0009	0.000	0.000	0.000
Xylenes (TAP)	0.0078	0.000	0.000	0.000
Nonanes	0.0444	0.000	0.000	0.000
Decanes Plus	0.0171	0.000	0.000	0.000
Other NM/NE HC	0.5633	0.000	0.003	0.000
Total Weight Percent:	100.0000			
Total TAP Emissions		0.00	0.01	0.00
Total VOC Emissions		**0.01**	**0.13**	**0.02**
Total Non VOC & Non TAP-HC		0.00	0.03	0.01
Total Emissions		0.02	0.45	0.08

Emission Calculations

Emission calculations shown below are presented for informational purposes only as vapors from the inhibitor oil blending tanks are routed to the atmospheric control flare (EPN: 11-07-F) for combustion, except during brief intervals when thief hatches are opened for purposes of sampling, gauging, etc.

POINT SOURCE I.D. NUMBER: ***9-07-IOT-V***

EMISSION SOURCE DESCRIPTION: ***1500 BBL Inhibitor Oil Blending Tank-Vent (BBJ-133B)***

DATA:

Emission Source:	***Crude Oil Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD/Tank - Q_{avg})**	***125***
Maximum Daily Oil Throughput: **(BBLD/Tank - Q_{max})**	***250***
Average VOC Working Losses - L_w (lb/yr):	***7,791.733***
Average VOC Standing Losses - L_S (lb/yr):	***3,343.250***
Basis of Estimates:	***AP-42, Chapter 7 (June 2020, Section 7.1.3.1); Refer to ensuing pages for summary***

Avg. Hourly Uncontrolled THC Losses (lb/hr)	= (Lw + Ls) * 1.134/8760	=	**1.44**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**2.45**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**6.31**

SPECIATION FACTORS:

Speciation factors were taken from "Air Emissions Species Manual - Volume I: Volatile Organic Compound Species Profiles", 2nd edition; Report No.: EPA-450/2-90-001a; page 258 and normalized to account for the presence of H_2S; reference ensuing pages.

UNCONTROLLED EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Hydrogen Sulfide (excluded from VOC total)	0.0011	0.0000	0.0000	0.0001
Methane (excluded from VOC total)	6.1996	0.0894	0.1519	0.3914
Ethane (excluded from VOC total)	5.5995	0.0807	0.1372	0.3535
Propane	17.6001	0.2537	0.4312	1.1112
Iso-Butane	1.5005	0.0216	0.0368	0.0947
N-Butane	27.1000	0.3906	0.6640	1.7110
Iso-Pentane	1.4996	0.0216	0.0367	0.0947
N-Pentane	14.5995	0.2104	0.3577	0.9217
Heptane	9.2003	0.1326	0.2254	0.5809
Octane	6.8994	0.0995	0.1690	0.4356

Other NM/NE Hydrocarbons	1.7994	0.0259	0.0441	0.1136
N-Hexane (TAP)	7.9006	0.1139	0.1936	0.4988
Benzene (TAP)	0.1005	0.0014	0.0025	0.0063
Total TAP Emissions		0.12	0.20	0.51
Total VOC Emissions		**1.27**	**2.16**	**5.57**
Total Non VOC & Non TAP-HC		0.17	0.29	0.74
Total Hydrocarbon Emissions		1.44	2.45	6.31

Calculated Avg. Gas Flowrate (SCFH) =	*10.66*

The mixing station blends chemicals in various combinations. When the word "solution" is used it is intended to indicate a mixture of various chemicals. Total material use indicated below:

Chemical Material	Specific Gravity	True Vapor Pressure (psia)	Throughput (gallons/year)
Corrosion Inhibitor	0.936	0.10	6,000
Paraffin Inhibitor	0.880	N/A	1,000
Asphaltine Inhibitor	0.93	0.20	750
Produced Oil	1.7685	3.36	1,916,250
Total Throughput (gallons/yr) =			1,924,000

EPA document 745-R-99-005 entitled "Look-up Tables for Estimating Toxic Release Inventory Air Emissions from Chemical Distribution Facilities" was used for determining the emissions during the mixing process and the emissions from the transfer of product to the final transport container; refer to ensuing pages for copy.

Chemical Material #1:		**Corrosion Inhibitor**			
CHEMICAL USAGE				**CHEMICAL THROUGHPUT**	
Gallons/Year	**Hour/Year**	**Specific Gravity**		**Hourly (lb/hr)**	**Annual (TPY)**
6,000.00	8,760.00	0.936		5.35	23.42
Emission Factors*					
A_1	A_2	A_5	A_6	*Throughput Factor (lb/yr)*	*City Factor*
34	*1*	*34*	*1*	*50,000*	*1.31*
A1 (lb/yr) = 41.72	A2 (lb/yr) = 1.23			A5 (lb/yr) = 41.72	A6 (lb/yr) = 1.23
				Total ΣTPY=	0.04

POLLUTANT:**	**Weight Percent**	**CALCULATED EMISSION RATES**	
		Hourly (lb/hr)	**Annual (TPY)**
VOCs	100.00	0.0098	0.0429
Total Weight Percent:	100.00		
Total TAP Emissions		0.01	0.04
Total VOC Emissions		**0.01**	**0.04**
Total Non VOC & Non TAP-HC		0.00	0.00
Total Emissions		0.01	0.04

**EPA document 745-R-99-005 entitled "Look-up Tables for Estimating Toxic Release Inventory Air Emissions from Chemical Distribution Facilities" was used for determining the emissions; refer to ensuing pages for copy.*

***HAP-Hazardous/Toxic Air Pollutant (listing taken from LAC 33:III.5112)*

NOTE: Emission factors for n-Hexane were used since the above solution is not listed in the EPA document and both are believed to have similar evaporation rates.

Chemical Material #2:		Paraffin Inhibitor			
CHEMICAL USAGE				CHEMICAL THROUGHPUT	
Gallons/Year		Hour/Year	Specific Gravity	Hourly (lb/hr)	Annual (TPY)
1,000.00		8,760.00	0.880	0.84	3.67
Emission Factors*					
A_1	A_2	A_5	A_6	*Throughput (lb/yr)*	*City Factor*
34	*1*	*34*	*1*	*50,000*	*1.31*
A1 (lb/yr) = 6.54		A2 (lb/yr) = 0.19		A5 (lb/yr) = 6.54	A6 (lb/yr) = 0.19
				Total ΣTPY=	0.01

POLLUTANT:**	Weight Percent	CALCULATED EMISSION RATES	
		Hourly (lb/hr)	Annual (TPY)
1,2,4-Trimethylbenzene	10.00	0.0002	0.0007
1,2,3-Trimethylbenzene	5.00	0.0001	0.0003
1,3,5-Trimethylbenzene	5.00	0.0001	0.0003
Light Aromatic Naphtha	20.00	0.0003	0.0013
Xylenes (TAP)	50.00	0.0008	0.0034
Ethylbenzene (TAP)	10.00	0.0002	0.0007
Total Weight Percent:	100.00		
Total TAP Emissions		0.00	0.00
Total VOC Emissions		**0.00**	**0.01**
Total Non VOC & Non TAP-HC		0.00	0.00
Total Emissions		0.00	0.01

**EPA document 745-R-99-005 entitled "Look-up Tables for Estimating Toxic Release Inventory Air Emissions from Chemical Distribution Facilities" was used for determining the emissions; refer to ensuing pages for copy.*

***HAP-Hazardous/Toxic Air Pollutant (listing taken from LAC 33:III.5112)*

NOTE: Emission factors for n-Hexane were used since the above solution is not listed in the EPA document and both are believed to have similar evaporation rates.

Chemical Material #3:		Asphaltine Inhibitor			
CHEMICAL USAGE				CHEMICAL THROUGHPUT	
Gallons/Year		Hour/Year	Specific Gravity	Hourly (lb/hr)	Annual (TPY)
750.00		8,760.00	0.93	0.66	2.91
Emission Factors*					
A_1	A_2	A_5	A_6	*Throughput (lb/yr)*	*City Factor*
34	*1*	*34*	*1*	*50,000*	*1.31*
A1 (lb/yr) = 5.18		A2 (lb/yr) = 0.15		A5 (lb/yr) = 5.18	A6 (lb/yr) = 0.15
				Total ΣTPY=	0.01

POLLUTANT:**	Weight Percent	CALCULATED EMISSION RATES	
		Hourly (lb/hr)	Annual (TPY)
1,2,4-Trimethylbenzene	18.00	0.0002	0.0010
1,2,3-Trimethylbenzene	3.00	0.0000	0.0002
1,3,5-Trimethylbenzene	3.00	0.0000	0.0002
Light Aromatic Naphtha	18.00	0.0002	0.0010
Polymer	37.00	0.0005	0.0020

Triethylenetetramine	3.00	0.0000	0.0002
Toluene (TAP)	18.00	0.0002	0.0010
Total Weight Percent:	100.00		
Total TAP Emissions		0.00	0.00
Total VOC Emissions		**0.00**	**0.01**
Total Non VOC & Non TAP-HC		0.00	0.00
Total Emissions		0.00	0.01

**EPA document 745-R-99-005 entitled "Look-up Tables for Estimating Toxic Release Inventory Air Emissions from Chemical Distribution Facilities" was used for determining the emissions; refer to ensuing pages for copy.*

***HAP-Hazardous/Toxic Air Pollutant (listing taken from LAC 33:III.5112)*

NOTE: Emission factors for n-Hexane were used since the above solution is not listed in the EPA document and both are believed to have similar evaporation rates.

Chemical Material #4:		**Produced Oil**			
CHEMICAL USAGE				**CHEMICAL THROUGHPUT**	
Gallons/Year		**Hour/Year**	**Specific Gravity**	**Hourly (lb/hr)**	**Annual (TPY)**
1,916,250.00		8,760.00	1.7685	3226.41	14131.66
Emission Factors*					
A_1	A_2	A_5	A_6	*Throughput (lb/yr)*	*City Factor*
6794	*112*	*2253*	*111*	*10,000,000*	*1.31*
A1 (lb/yr) = 25154.76		A2 (lb/yr) = 414.68		A5 (lb/yr) = 8,341.72	A6 (lb/yr) = 410.98
				Total ΣTPY=	17.16

POLLUTANT:**	**Weight Percent**	**CALCULATED EMISSION RATES**	
		Hourly (lb/hr)	**Annual (TPY)**
Methane (excluded from VOC total)	6.1995	0.2429	1.0639
Ethane (excluded from VOC total)	5.5993	0.2194	0.9609
Carbon Dioxide (excluded from VOC total)	0.0000	0.0000	0.0000
Hydrogen Sulfide (excluded from VOC total)	0.0033	0.0001	0.0006
Propane	17.5997	0.6896	3.0203
Iso-Butane	1.5004	0.0588	0.2575
N-Butane	27.0994	1.0618	4.6505
Iso-Pentane	1.4996	0.0588	0.2573
N-Pentane	14.5991	0.5720	2.5054
Heptanes	9.2001	0.3605	1.5788
Octane	6.8992	0.2703	1.1840
Other NM/NE Hydrocarbons	1.7994	0.0705	0.3088

N-Hexane (TAP)	7.9004	0.3095	1.3558
Benzene (TAP)	0.1005	0.0039	0.0173
Total Weight Percent:	100.0000		
Total TAP Emissions		0.31	1.37
Total VOC Emissions		**3.46**	**15.14**
Total Non VOC & Non TAP-HC		0.46	2.03
Total Emissions		3.92	17.16

**EPA document 745-R-99-005 entitled "Look-up Tables for Estimating Toxic Release Inventory Air Emissions from Chemical Distribution Facilities" was used for determining the emissions; refer to ensuing pages for copy.*

***HAP-Hazardous/Toxic Air Pollutant (listing taken from LAC 33:III.5112)*

NOTE: Emission factors for n-Hexane were used since the above solution is not listed in the EPA document and both are believed to have similar evaporation rates.

DATA:

Emission Source:	***Blanket Gas***
Average Annual Tank Throughput (BBLs/Yr):	***45,625***
Gross Blanket Gas Required (MSCF/Yr):	***256***
Gas from Process to Tank(s) (MSCF/Yr):	***0***
Calculated Volume Requirement (MSCF/Yr):	***256***
Net Blanket Gas Supplied (MSCF/Yr):	***256***
Maximum Hourly Fill Rate (BBLs/Hr):	***10***
Blanket Gas Specific Gravity: ***(based on an actual wet gas analysis)***	***1.4172***
Basis of Estimates:	***Manufacturers Gas Consumption Data & Actual Wet Gas Analysis***

Avg. Hourly Uncontrolled Emissions (lb/hr)	=	Gas Rate/8760 Hrs/Yr * 0.0764 * SG	=	**3.16**
Max. Hourly Uncontrolled Emissions (lb/hr)	=	Max. Fill Rate * 42/7.48 * 0.0764 * SG	=	**6.08**
Annual Potential Uncontrolled Emissions (TPY)	=	Annual Gas Rate * 0.0764 * SG/2000	=	**13.86**

SPECIATION FACTORS:

Speciation of the blanket gas is based on an actual wet gas analysis and normalized to account for the presence of H_2S; refer to Southern Petroleum Laboratories Report No.: 172-23080182-003A in ensuing pages.

UNCONTROLLED EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.1196	0.0038	0.0073	0.0166
Carbon Dioxide (excluded from VOC total)	92.3491	2.9221	5.6144	12.7987
Methane (excluded from VOC total)	4.1413	0.1310	0.2518	0.5739
Ethane (excluded from VOC total)	1.0647	0.0337	0.0647	0.1476
Hydrogen Sulfide (excluded from VOC total)	0.0013	0.0000	0.0001	0.0002
Propane	0.6228	0.0197	0.0379	0.0863
Iso-Butane	0.2073	0.0066	0.0126	0.0287

N-Butane	0.3370	0.0107	0.0205	0.0467
Iso-Pentane	0.2319	0.0073	0.0141	0.0321
N-Pentane	0.1573	0.0050	0.0096	0.0218
Iso-Hexane	0.1692	0.0054	0.0103	0.0235
N-Hexane (TAP)	0.0816	0.0026	0.0050	0.0113
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.0395	0.0013	0.0024	0.0055
Cyclohexane	0.0561	0.0018	0.0034	0.0078
Heptanes	0.1548	0.0049	0.0094	0.0215
Methylcyclohexane	0.0666	0.0021	0.0041	0.0092
Toluene (TAP)	0.0170	0.0005	0.0010	0.0024
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.0806	0.0026	0.0049	0.0112
Ethylbenzene (TAP)	0.0013	0.0000	0.0001	0.0002
Xylenes (TAP)	0.0114	0.0004	0.0007	0.0016
Nonanes	0.0646	0.0020	0.0039	0.0090
Decanes Plus	0.0249	0.0008	0.0015	0.0035
Total Weight Percent:	100.0000			
Total TAP Emissions		0.00	0.01	0.02
Total VOC Emissions		**0.07**	**0.14**	**0.32**
Total Non VOC & Non TAP-HC		0.16	0.32	0.72
Total Emissions		3.16	6.08	13.86

Uncontrolled VOC Emission Total (TPY)	Storage Vapors + Blending Emissions + Blanket Gas	=	**21.09**

DATA:

Emission Source:	***Losses When Opening Thief Hatches***
Specific Gravity of Gas:	***1.5112***
Maximum Thief Hatch Venting (Hrs) **(Under Normal/Routine Operating Conditions)**	***30***
Max. Minutes a Hatch is Opened in a Single Hr:	***5***
Maximum Hourly Emission Rate (lb/hr): **(from preceding tank emission estimates)**	***0.45***

Avg. Hourly Emissions (lb/hr)	=	Annual Total/8760 (hrs/yr)	=	**0.02**
Maximum Hourly Emissions (lb/hr)	=	Max. Emission Rate * Max. Minutes/Hr Hatch is Open	=	**0.45**
Maximum Annual Emissions (TPY)	=	Max. Hourly THC Rate * Hours/Yr Hatch is Open	=	**0.08**

EMISSION SUMMARY (based on weighted average of all streams contributing to tank emissions; refer to ensuing pages):				
POLLUTANT:	**Weight Percent**	**CALCULATED EMISSION RATES**		
		Average Hourly (lb/hr)	**Maximum Hourly (lb/hr)**	**Annual (TPY)**
Nitrogen (excluded from VOC total)	0.0822	0.000	0.000	0.000
Carbon Dioxide (excluded from VOC total)	63.4401	0.012	0.285	0.052
Methane (excluded from VOC total)	4.7856	0.001	0.022	0.004
Ethane (excluded from VOC total)	2.4842	0.000	0.011	0.002
Hydrogen Sulfide (excluded from VOC total)	0.0012	0.000	0.000	0.000
Propane	5.9373	0.001	0.027	0.005
Iso-Butane	0.6121	0.000	0.003	0.000
N-Butane	8.7148	0.002	0.039	0.007
Iso-Pentane	0.6287	0.000	0.003	0.001
N-Pentane	4.6782	0.001	0.021	0.004
Iso-Hexane	0.1162	0.000	0.001	0.000
N-Hexane (TAP)	2.5292	0.000	0.011	0.002
Methylcyclopentane	0.0000	0.000	0.000	0.000
Benzene (TAP)	0.0586	0.000	0.000	0.000
Cyclohexane	0.0385	0.000	0.000	0.000
Heptanes	2.9864	0.001	0.013	0.002
Methylcyclohexane	0.0458	0.000	0.000	0.000
Toluene (TAP)	0.0117	0.000	0.000	0.000
2,2,4-Trimethylpentane (TAP)	0.0000	0.000	0.000	0.000
Octanes	2.2154	0.000	0.010	0.002
Ethylbenzene (TAP)	0.0009	0.000	0.000	0.000
Xylenes (TAP)	0.0078	0.000	0.000	0.000
Nonanes	0.0444	0.000	0.000	0.000
Decanes Plus	0.0171	0.000	0.000	0.000
Other NM/NE HC	0.5633	0.000	0.003	0.000
Total Weight Percent:	100.0000			
Total TAP Emissions		0.00	0.01	0.00
Total VOC Emissions		**0.01**	**0.13**	**0.02**
Total Non VOC & Non TAP-HC		0.00	0.03	0.01
Total Emissions		0.02	0.45	0.08

Emission Calculations

POINT SOURCE I.D. NUMBER: ***11-07-F***

EMISSION SOURCE DESCRIPTION: ***Atmospheric Control Flare (ZZZ-191)***

DATA:

Emission Source:	***Unburned Hydrocarbons and Products of Combustion***
Atmospheric Gas Streams:	
Gas Stream #1:	***Oil Storage Tank Vapors***
Gas Heat of Combustion (BTU/Ft^3-actual normalized flare gas analysis):	***742***
Combustion Efficiency:	***98% for all HC***

Gas Stream #1 - Oil Storage Tank Vapors

Gas volume estimates are supported by the calculations associated with EPNs: 2a-07-OST-CV, 3-07-OST-V, 7a-07-OST-CV, 8-07-IOT-V, & 9-07-IOT-V and are outlined below:

INPUT				
Maximum Gas Flowrate (scf/hr)	*Operating Time (hrs/year)*	*Burn Efficiency (%)*	*Gas Heat of Combustion (BTU/FT^3)*	*Specific Gravity of Gas*
3,731.05	*8,760*	*98*	*742*	*1.5532*

CALCULATIONS						
Gas Combusted (Annual hourly average)	=	*gas rate (scf/hr)*	*x*	*efficiency*	*x*	*usage (hrs/yr)*
	=	*3,731.05*	*x*	*0.98*	*x*	*8,760*
	=	***32,030,324 scf/yr***		=	***3,656 SCF/hr***	
Heat Content (annual hourly average)	=	gas rate (scf/yr)	x	gas heat of combustion (BTU/scf)		
	=	*32,030,324*	*x*	*742*		
	=			***2.7143 MMBTU/Hr***		
Uncontrolled Max. Hourly Emissions (lbs/hr)	=	*gas specific gravity*	*x*	*density of air (lb/SCF)*	*x*	*Maximum Gas Rate (SCF/Hr)*
	=	*1.5532*	*x*	*0.0764*	*x*	*3,731*
	=	***442.74 lbs/hr***				
Uncontrolled Annual Emissions (TPY)	=	*gas specific gravity*	*x*	*density of air (tons/SCF)*	*x*	*Total Gas Rate (SCF/Yr)*
	=	*1.5532*	*x*	*0.0000382*	*x*	*32,684,004*
	=	***1,939.22 TPY***				

SPECIATION FACTORS:

Speciation of the flash gas mixture is based on an actual flare gas analysis and normalized to account for the presence of H_2S; refer to Southern Petroleum Laboratories Report No.: 172-23080182-002A in ensuing pages.

EMISSIONS SUMMARY:

POLLUTANT:	**Weight Percent**	**CALCULATED EMISSION RATES**		
		Average Hourly (lb/hr)	**Maximum Hourly (lb/hr)**	**Annual (TPY)**
Nitrogen (excluded from VOC total)	2.9695	13.1472	13.1472	57.5845
Carbon Dioxide (excluded from VOC total)	0.5081	2.2496	2.2496	9.8534
Methane (excluded from VOC total)	67.8460	6.0077	6.0077	26.3136
Ethane (excluded from VOC total)	3.1613	0.2799	0.2799	1.2261
Hydrogen Sulfide (TAP; excluded from VOC total)	0.0038	0.0003	0.0003	0.0015
Propane	6.8039	0.6025	0.6025	2.6389
Iso-Butane	3.4505	0.3055	0.3055	1.3383

N-Butane	5.8298	0.5162	0.5162	2.2611
Iso-Pentane	3.8040	0.3368	0.3368	1.4754
N-Pentane	2.2492	0.1992	0.1992	0.8724
Iso-Hexanes	1.7545	0.1554	0.1554	0.6805
N-Hexane (TAP)	0.5657	0.0501	0.0501	0.2194
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.0747	0.0066	0.0066	0.0290
Cyclohexane	0.1816	0.0161	0.0161	0.0704
Heptanes	0.5261	0.0466	0.0466	0.2040
Methylcyclohexane	0.0647	0.0057	0.0057	0.0251
Toluene (TAP)	0.0037	0.0003	0.0003	0.0014
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.1138	0.0101	0.0101	0.0442
Ethylbenzene (TAP)	0.0016	0.0001	0.0001	0.0006
Xylenes (TAP)	0.0035	0.0003	0.0003	0.0014
Nonanes	0.0601	0.0053	0.0053	0.0233
Decanes Plus	0.0237	0.0021	0.0021	0.0092
Other NM/NE HC	0.0000	0.0000	0.0000	0.0000
TOTAL WEIGHT PERCENT:	100.0000			
TOTAL TAP EMISSIONS:		0.06	0.06	0.25
TOTAL VOC EMISSIONS:		**2.26**	**2.26**	**9.89**
TOTAL Non-VOC & Non-TAP HC:		6.29	6.29	27.54
TOTAL EMISSIONS:		23.94	23.94	104.87

Total of Average Hourly VOC emissions estimated for this source:	**2.26 Lbs/Hr**
Total of Maximum Hourly VOC emissions estimated for this source:	**2.26 Lbs/Hr**
Total of Maximum Annual VOC emissions estimated for this source:	**9.89 TPY**

CALCULATIONS - Selected Combustion Products

Summary of all routine streams combusted by this flare:

Gas Stream	*Annual Operating Hours*	*Average Flowrate (SCF/Hr)*	*Maximum Flowrate (SCF/Hr)*	*Average Heat Rate (MMBTU/Hr)*	*Maximum Heat Rate (MMBTU/Hr)*
1. Oil Storage Tank Vapors	8760	3731.05	3731.05	2.7143	2.7143
	Totals:	***3731.05***	***3731.05***	***2.71***	***2.71***

Emission factor for soot is from AP-42 "Compilation of Air Pollution Emission Factors" for an industrial burn flare stack (refer to ensuing pages for copies of supporting documentation).
SO_2 emissions based on the composite H_2S composition of the flare gas streams assuming stoichiometric combustion.

POLLUTANT:	Emission Factor (lb/SCF)	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Soot (expressed as PM_{10})	0.000011	0.04	0.04	0.18
Soot (expressed as $PM_{2.5}$)	0.000011	0.04	0.04	0.18
SO_2	N/A	0.03	0.03	0.14

Emission factors for nitrogen oxide and carbon monoxide are from a 1983 CMA document entitled "A Report on a Flare Efficiency Study", for a non-assisted industrial burn flares. (refer to ensuing pages for copies of supporting documentation).

POLLUTANT:	Emission Factor (lb/10^6 BTU)	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen Oxides	0.0641	0.17	0.17	0.76
CO	0.5496	1.49	1.49	6.52

Emission Calculations

POINT SOURCE I.D. NUMBER: ***12-07-F***

EMISSION SOURCE DESCRIPTION: ***Emergency LP Control Flare (ZZZ-190)***

DATA:

Emission Source:	***Unburned Hydrocarbons and Products of Combustion***
Low Pressure Gas Streams:	
Gas Stream #1:	***Heater Treater-Flash Gas & Water Flash Drum-Flash Gas***
Gas Heat of Combustion (BTU/Ft^3-actual normalized flare gas analysis):	***114***
Assist Gas Feed (Propane):	***Yes***
Gas Heat of Combustion (BTU/Ft^3):	***2516***
Combustion Efficiency:	***98% for all HC***

Gas Stream #1 - Heater Treater-Flash Gas & Water Flash Drum-Flash Gas

Gas volume estimates are supported by the calculations associated with EPNs: 18-07-HT-WG & 19-07-WFD-WG and are outlined below.

INPUT					
Maximum Gas Flowrate (scf/hr)	*Operating Time (hrs/year)*	*Burn Efficiency (%)*	*Gas Heat of Combustion (BTU/FT^3)*	*Specific Gravity of Gas*	
9,638.33	*8,760*	*98*	*114*	*1.4750*	

CALCULATIONS						
Gas Combusted (Annual hourly average)	=	*gas rate (scf/hr)*	*x*	*efficiency*	*x*	*usage (hrs/yr)*
	=	*9,638*	*x*	*0.98*	*x*	*8,760*
	=	***82,743,135 scf/yr***		=	***9,446 SCF/hr***	
Heat Content (annual hourly average)	=	gas rate (scf/yr)	x	gas heat of combustion (BTU/scf)		
	=	*82,743,135*	*x*	*114*		
	=	***1.0768 MMBTU/Hr***				
Uncontrolled Max. Hourly Emissions (lbs/hr)	=	*gas specific gravity*	*x*	*density of air (lb/SCF)*	*x*	*Maximum Gas Rate (SCF/Hr)*
	=	*1.4750*	*x*	*0.0764*	*x*	*9,638*
	=	***1,086.14 lbs/hr***				
Uncontrolled Annual Emissions (TPY)	=	*gas specific gravity*	*x*	*density of air (tons/SCF)*	*x*	*Total Gas Rate (SCF/Yr)*
	=	*1.4750*	*x*	*0.0000382*	*x*	*84,431,771*
	=	***4,757.31 TPY***				

SPECIATION FACTORS:

Speciation of the flash gas mixture is based on an actual flare gas analysis and normalized to account for the presence of H_2S; refer to Southern Petroleum Laboratories Report No.: 2030-16080193-002A in ensuing pages.

EMISSIONS SUMMARY:

POLLUTANT:	**Weight Percent**	**CALCULATED EMISSION RATES**		
		Average Hourly (lb/hr)	**Maximum Hourly (lb/hr)**	**Annual (TPY)**
Nitrogen (excluded from VOC total)	2.7499	29.8674	29.8674	130.8191
Carbon Dioxide (excluded from VOC total)	92.6546	1006.3619	1006.3619	4407.8653
Methane (excluded from VOC total)	0.9777	0.2124	0.2124	0.9303
Ethane (excluded from VOC total)	0.7606	0.1652	0.1652	0.7237
Hydrogen Sulfide (TAP; excluded from VOC total)	0.0024	0.0005	0.0005	0.0023
Propane	0.8464	0.1839	0.1839	0.8053
Iso-Butane	0.2962	0.0643	0.0643	0.2818
N-Butane	0.5313	0.1154	0.1154	0.5055

Iso-Pentane	0.3508	0.0762	0.0762	0.3338
N-Pentane	0.2311	0.0502	0.0502	0.2199
Iso-Hexanes	0.2075	0.0451	0.0451	0.1974
N-Hexane (TAP)	0.0846	0.0184	0.0184	0.0805
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.0310	0.0067	0.0067	0.0295
Cyclohexane	0.0551	0.0120	0.0120	0.0524
Heptanes	0.1382	0.0300	0.0300	0.1315
Methylcyclohexane	0.0000	0.0000	0.0000	0.0000
Toluene (TAP)	0.0022	0.0005	0.0005	0.0020
2,2,4-Trimethylpentane (TAP)	0.0748	0.0162	0.0162	0.0711
Octanes	0.0027	0.0006	0.0006	0.0025
Ethylbenzene (TAP)	0.0000	0.0000	0.0000	0.0000
Xylenes (TAP)	0.0000	0.0000	0.0000	0.0000
Nonanes	0.0030	0.0007	0.0007	0.0029
Decanes Plus	0.0000	0.0000	0.0000	0.0000
Other Nm/NE HC	0.0000	0.0000	0.0000	0.0000
TOTAL WEIGHT PERCENT:	100.0000			
TOTAL TAP EMISSIONS:		0.04	0.04	0.19
TOTAL VOC EMISSIONS:		**0.62**	**0.62**	**2.72**
TOTAL Non-VOC & Non-TAP HC:		0.38	0.38	1.65
TOTAL EMISSIONS:		1037.23	1037.23	4543.06

Assist Gas (Propane) (anticipated volume needed to ensure an adequate heat content):

INPUT				
Maximum Gas Flowrate (scf/hr)	*Operating Time (hrs/year)*	*Burn Efficiency (%)*	*Gas Heat of Combustion (BTU/FT^3)*	*Specific Gravity of Gas*
385.00	*8,760*	*98*	*2516*	*1.52*

CALCULATIONS						
Gas Combusted (annual hourly average)	=	*gas rate (scf/hr)*	*x*	*efficiency*	*x*	*usage (hrs/yr)*
	=	*385*	*x*	*0.98*	*x*	*8,760*
	=	***3,305,148 scf/yr***		=	***377 SCF/hr***	
Heat Content (annual hourly average)	=	gas rate (scf/yr)	x	gas heat of combustion (BTU/scf)		
	=	*3,305,148*	*x*	*2516*		
	=	***0.9493 MMBTU/Hr***				
Uncontrolled Max. Hourly Emissions (lbs/hr)	=	*gas specific gravity*	*x*	*density of air (lb/SCF)*	*x*	*Maximum Gas Rate (SCF/Hr)*
	=	*1.52*	*x*	*0.0764*	*x*	*385*
	=	***44.71 lbs/hr***				
Uncontrolled Annual Emissions (TPY)	=	*gas specific gravity*	*x*	*density of air (tons/SCF)*	*x*	*Total Gas Rate (SCF/Yr)*
	=	*1.52*	*x*	*0.0000382*	*x*	*3,372,600*
	=	***195.83 TPY***				

SPECIATION FACTORS:

Speciation of the assist gas is based on propane.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Propane	100.00	0.8942	0.8942	3.9165
TOTAL WEIGHT PERCENT:	100.00			
TOTAL TAP EMISSIONS:		0.00	0.00	0.00
TOTAL VOC EMISSIONS:		**0.89**	**0.89**	**3.92**
TOTAL Non-VOC & Non-TAP HC:		0.00	0.00	0.00
TOTAL EMISSIONS:		0.89	0.89	3.92

Total of Average Hourly VOC emissions estimated for this source:	**1.51 Lbs/Hr**
Total of Maximum Hourly VOC emissions estimated for this source:	**1.51 Lbs/Hr**
Total of Maximum Annual VOC emissions estimated for this source:	**6.64 TPY**

CALCULATIONS - Selected Combustion Products

Summary of all routine streams combusted by this flare:

Gas Stream	*Annual Operating Hours*	*Average Flowrate (SCF/Hr)*	*Maximum Flowrate (SCF/Hr)*	*Average Heat Rate (MMBTU/Hr)*	*Maximum Heat Rate (MMBTU/Hr)*
1. Heater Treater-Flash Gas & Water Flash Drum-Flash Gas	8760	9638.33	9638.33	1.0768	1.0768
Assist Gas Feed (Propane)	8760	385.00	385.00	0.9493	0.9493
Totals:		***10023.33***	***10023.33***	***2.03***	***2.03***

Emission factor for soot is from AP-42 "Compilation of Air Pollution Emission Factors" for an industrial burn flare stack (refer to ensuing pages for copies of supporting documentation).
SO_2 emissions based on the composite H_2S composition of the flare gas streams assuming stoichiometric combustion.

POLLUTANT:	Emission Factor (lb/SCF)	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Soot (expressed as PM_{10})	0.000011	0.11	0.11	0.48
Soot (expressed as $PM_{2.5}$)	0.000011	0.11	0.11	0.48
SO_2	N/A	0.05	0.05	0.21

Emission factors for nitrogen oxide and carbon monoxide are from a 1983 CMA document entitled "A Report on a Flare Efficiency Study", for a non-assisted industrial burn flares. (refer to ensuing pages for copies of supporting documentation).

POLLUTANT:	Emission Factor (lb/10^6 BTU)	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen Oxides	0.0641	0.13	0.13	0.57
CO	0.5496	1.12	1.12	4.89

Emission Calculations

POINT SOURCE I.D. NUMBER: ***13-07-CST***

EMISSION SOURCE DESCRIPTION: ***500 Gallon Chemical Storage Tank (BBJ-134A)***

DATA:

Emission Source:	***"Working" & "Standing" Losses***
Maximum Annual Throughput: (Gallons/Yr)	***1,500***
Average VOC Working Losses - L_w (lb/yr):	***7.837***
Average VOC Standing Losses - L_S (lb/yr):	***68.382***
Basis of Estimates:	***AP-42, Chapter 7 (June 2020, Section 7.1.3.1); Refer to ensuing pages for summary***

Avg. Hourly Uncontrolled THC Losses (lb/hr)	=	(Lw + Ls)/8760	=	**0.01**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**0.04**

For purposes of permitting and/or providing conservative emission estimates, emissions were calculated using n-Hexane as the stored material for this tank. A tank size of 500 gallons and an annual throughput of approximately 1,500 gallons were used in the emissions model in an effort to demonstrate a conservative potential emissions estimate.

Emission Calculations

POINT SOURCE I.D. NUMBER: ***14-07-CST***

EMISSION SOURCE DESCRIPTION: ***500 Gallon Chemical Storage Tank (BBJ-134B)***

DATA:

Emission Source:	***"Working" & "Standing" Losses***
Maximum Annual Throughput: (Gallons/Yr)	***2,000***
Average VOC Working Losses - L_w (lb/yr):	***10.450***
Average VOC Standing Losses - L_S (lb/yr):	***68.382***
Basis of Estimates:	***AP-42, Chapter 7 (June 2020, Section 7.1.3.1); Refer to ensuing pages for summary***

Avg. Hourly Uncontrolled THC Losses (lb/hr)	=	(Lw + Ls)/8760	=	**0.01**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**0.04**

For purposes of permitting and/or providing conservative emission estimates, emissions were calculated using n-Hexane as the stored material for this tank. A tank size of 500 gallons and an annual throughput of approximately 2,000 gallons were used in the emissions model in an effort to demonstrate a conservative potential emissions estimate.

Emission Calculations

POINT SOURCE I.D. NUMBER: ***15-07-CST***

EMISSION SOURCE DESCRIPTION: ***2000 Gallon Chemical Storage Tank (BBJ-134C)***

DATA:

Emission Source:	***"Working" & "Standing" Losses***
Maximum Annual Throughput: (Gallons/Yr)	***12,000***
Average VOC Working Losses - L_W (lb/yr):	***63.299***
Average VOC Standing Losses - L_S (lb/yr):	***252.767***
Basis of Estimates:	***AP-42, Chapter 7 (June 2020, Section 7.1.3.1); Refer to ensuing pages for summary***

Avg. Hourly Uncontrolled THC Losses (lb/hr)	=	(Lw + Ls)/8760	=	**0.04**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**0.16**

For purposes of permitting and/or providing conservative emission estimates, emissions were calculated using n-Hexane as the stored material for this tank. A tank size of 2,000 gallons and an annual throughput of approximately 12,000 gallons were used in the emissions model in an effort to demonstrate a conservative potential emissions estimate.

Emission Calculations

POINT SOURCE I.D. NUMBER: ***16-07-CB***

EMISSION SOURCE DESCRIPTION: ***High Pressure Compressor Blowdowns***

DATA:

Emission Source:	***Compressor Blowdowns***
Gas Specific Gravity:	***1.4172***
Maximum Volume per Blowdown (MSCF): *(conservative estimate provided by operator)*	***23.2***
Maximum Number of Blowdowns per year:	***48***
Basis of Emission Estimates:	***Conservative Estimate Provided by Operator & Actual Wet Gas Analysis***

Blowdown Gas Volume (SCF/Yr)	=	Volume per Blowdown * Annual # of Blowdowns	=	**1113600.00**
Avg. Hourly Uncontrolled Emissions (lb/hr)	=	Gas Gravity * Density of Air * Volume per Blowdown	=	**2511.96**
Max. Hourly Uncontrolled Emissions (lb/hr)	=	Avg. Emissions	=	**2511.96**
Annual Potential Uncontrolled Emissions (TPY)	=	Hourly * Annual # of Blowdowns / 2000	=	**60.29**

SPECIATION FACTORS:

Speciation of the blowdown gas mixture is based on an actual wet gas analysis and normalized to account for the presence of H_2S; refer to Southern Petroleum Laboratories Report No.: 172-23080182-003A in ensuing pages.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.1196	3.0047	3.0047	0.0721
Carbon Dioxide (excluded from VOC total)	92.3491	2319.7714	2319.7714	55.6745
Methane (excluded from VOC total)	4.1413	104.0278	104.0278	2.4967
Ethane (excluded from VOC total)	1.0647	26.7437	26.7437	0.6418
Hydrogen Sulfide (excluded from VOC total)	0.0013	0.0333	0.0333	0.0008
Propane	0.6228	15.6450	15.6450	0.3755
Iso-Butane	0.2073	5.2077	5.2077	0.1250
N-Butane	0.3370	8.4652	8.4652	0.2032
Iso-Pentane	0.2319	5.8251	5.8251	0.1398
N-Pentane	0.1573	3.9510	3.9510	0.0948
Iso-Hexane	0.1692	4.2504	4.2504	0.1020
N-Hexane (TAP)	0.0816	2.0488	2.0488	0.0492
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.0395	0.9930	0.9930	0.0238
Cyclohexane	0.0561	1.4094	1.4094	0.0338
Heptanes	0.1548	3.8889	3.8889	0.0933

Methylcyclohexane	0.0666	1.6741	1.6741	0.0402
Toluene (TAP)	0.0170	0.4280	0.4280	0.0103
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.0806	2.0244	2.0244	0.0486
Ethylbenzene (TAP)	0.0013	0.0324	0.0324	0.0008
Xylenes (TAP)	0.0114	0.2855	0.2855	0.0069
Nonanes	0.0646	1.6225	1.6225	0.0389
Decanes Plus	0.0249	0.6261	0.6261	0.0150
Total Weight Percent:	100.0000			
Total TAP Emissions		3.82	3.82	0.09
Total VOC Emissions		**58.38**	**58.38**	**1.40**
Total Non VOC & Non TAP-HC		130.77	130.77	3.14
Total Emissions		2511.96	2511.96	60.29

VOC Emission Total (TPY)	=	Compressor Blowdowns	=	**1.40**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***17-07-CB***

EMISSION SOURCE DESCRIPTION: ***Low Pressure Compressor Blowdowns***

DATA:

Emission Source:	***Compressor Blowdowns***
Gas Specific Gravity:	***1.4172***
Maximum Volume per Blowdown (MSCF): *(conservative estimate provided by operator)*	***23.2***
Maximum Number of Blowdowns per Year:	***12***
Basis of Emission Estimates:	***Conservative Estimate Provided by Operator & Actual Wet Gas Analysis***

Blowdown Gas Volume (SCF/Yr)	=	Volume per Blowdown * Annual # of Blowdowns * 1000	=	**278400.00**
Avg. Hourly Uncontrolled Emissions (lb/hr)	=	Gas Gravity * Density of Air * Volume per Blowdown	=	**2511.96**
Max. Hourly Uncontrolled Emissions (lb/hr)	=	Avg. Emissions	=	**2511.96**
Annual Potential Uncontrolled Emissions (TPY)	=	Hourly * Annual # of Blowdowns / 2000	=	**15.07**

SPECIATION FACTORS:

Speciation of the blowdown gas mixture is based on an actual wet gas analysis and normalized to account for the presence of H_2S; refer to Southern Petroleum Laboratories Report No.: 172-23080182-003A in ensuing pages.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.1196	3.0047	3.0047	0.0180
Carbon Dioxide (excluded from VOC total)	92.3491	2319.7714	2319.7714	13.9186
Methane (excluded from VOC total)	4.1413	104.0278	104.0278	0.6242
Ethane (excluded from VOC total)	1.0647	26.7437	26.7437	0.1605
Hydrogen Sulfide (excluded from VOC total)	0.0013	0.0333	0.0333	0.0002
Propane	0.6228	15.6450	15.6450	0.0939
Iso-Butane	0.2073	5.2077	5.2077	0.0312
N-Butane	0.3370	8.4652	8.4652	0.0508
Iso-Pentane	0.2319	5.8251	5.8251	0.0350
N-Pentane	0.1573	3.9510	3.9510	0.0237
Iso-Hexane	0.1692	4.2504	4.2504	0.0255
N-Hexane (TAP)	0.0816	2.0488	2.0488	0.0123
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.0395	0.9930	0.9930	0.0060
Cyclohexane	0.0561	1.4094	1.4094	0.0085
Heptanes	0.1548	3.8889	3.8889	0.0233

Methylcyclohexane	0.0666	1.6741	1.6741	0.0100
Toluene (TAP)	0.0170	0.4280	0.4280	0.0026
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.0806	2.0244	2.0244	0.0121
Ethylbenzene (TAP)	0.0013	0.0324	0.0324	0.0002
Xylenes (TAP)	0.0114	0.2855	0.2855	0.0017
Nonanes	0.0646	1.6225	1.6225	0.0097
Decanes Plus	0.0249	0.6261	0.6261	0.0038
Total Weight Percent:	100.0000			
Total TAP Emissions		3.82	3.82	0.02
Total VOC Emissions		**58.38**	**58.38**	**0.35**
Total Non VOC & Non TAP-HC		130.77	130.77	0.78
Total Emissions		2511.96	2511.96	15.07

VOC Emission Total (TPY)	=	Compressor Blowdowns	=	**0.35**

Emission Calculations

Emission calculations shown below are presented for informational purposes only as off-gas from the heater treater is routed to the emergency LP control flare (EPN: 12-07-F) for combustion.

POINT SOURCE I.D. NUMBER: ***18-07-HT-WG***

EMISSION SOURCE DESCRIPTION: ***Heater Treater-Flash Gas***

DATA:

Emission Source:	***Heater Treater Flash Gas***
Flash Gas Specific Gravity:	***1.5010***
Average Oil Throughput: **(BBLD)**	***3000***
Basis of Emission Estimates:	***Comparable Analysis/Vasquez-Beggs Correlation***

Estimates for gas volumes and composition associated with this stage of the process were derived from a laboratory test of an oil sample collected at another site under similar conditions (pressure & temperature) and normalized to account for the presence of H_2S, refer to PENCOR Report No.: 31554-5006038374 in ensuing pages. This representative analysis is expected to yield a comparable VOC total but individual component values may vary from site to site. The following table shows the field conditions compared to the results from the laboratory test:

API Oil Gravity @ 60°F	Process Conditions		Gas/Oil Ratio
	Pressure (PSIG)	Temperature (°F)	(SCF/BBL)
Actual Facility Conditions:			
40.52	185	92	
	46	110	Unknown
Laboratory Conditions:			
35.7	200	86	
	39	120	75
		Prorated GOR Estimate:	**71.44**

Since an oil flash analysis has not been performed on an actual sample collected from this particular producing zone, the "Gas to Oil" (GOR) ratio estimated above will be compared with a value derived from the Vasquez-Beggs Correlation presented in the following table. For purposes of permitting, the higher of the two GOR values will be used within these emission estimates.

VASQUEZ-BEGGS CORRELATION		
I N P U T	*Stock Tank Oil API Gravity (O_g) =*	*40.52*
	Gas Specific Gravity (G_g) =	*1.5010*
	Flash Gas Pressure Drop (P); corrected to psia =	*154*
	Pressure Vessel Temperature (T) in °R	*552*

	Constants		
	°API Gravity		
°API →	**≤ 30**	**> 30**	Constants Used based on API Gravity
C1	0.0362	0.0178	0.0178
C2	1.0937	1.187	1.187
C3	25.724	23.931	23.931

GOR =	**$(C1) * (G_g) * (P^{C2}) * e^{[(C3)(Og)/T]}$**	=	**62.42** scf/bbl

refer to "Correlations for Fluid Physical Property Prediction" Journal of Petroleum Technology, Society of Petroleum Engineers, 1980

Avg. Hourly Uncontrolled Flash Rate (SCF/Hr)	=	Oil Rate * GOR	=	**8930.00**
Avg. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Flash Gas Gravity * Density of Air * Flash Rate	=	**1024.06**
Max. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Flash Gas Gravity * Density of Air * Flash Rate	=	**1024.06**
Annual Potential Uncontrolled Flash Emissions (TPY)	=	Hourly * 8760/2000	=	**4485.38**

SPECIATION FACTORS:

Speciation of the flash gas mixture taken from the referenced laboratory results and normalized to account for the presence of H_2S; refer to PENCOR Report No.: 31554-5006038374 in ensuing pages.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.0766	0.7842	0.7842	3.4349
Carbon Dioxide (excluded from VOC total)	87.7169	898.2743	898.2743	3934.4405
Methane (excluded from VOC total)	2.1972	22.5009	22.5009	98.5541
Ethane (excluded from VOC total)	0.8268	8.4674	8.4674	37.0872
Hydrogen Sulfide (excluded from VOC total)	0.0023	0.0241	0.0241	0.1053
Propane	1.7373	17.7908	17.7908	77.9238
Iso-Butane	0.5554	5.6881	5.6881	24.9137
N-Butane	1.3686	14.0151	14.0151	61.3859
Iso-Pentane	1.0177	10.4214	10.4214	45.6459
N-Pentane	0.8917	9.1315	9.1315	39.9959
Iso-Hexane	0.7661	7.8456	7.8456	34.3637
N-Hexane (HAP)	0.4395	4.5006	4.5006	19.7125
Methylcyclopentane	0.2417	2.4748	2.4748	10.8397
Benzene (HAP)	0.1238	1.2679	1.2679	5.5536
Cyclohexane	0.1895	1.9403	1.9403	8.4983
Heptanes	0.6215	6.3646	6.3646	27.8770
Methylcyclohexane	0.3315	3.3952	3.3952	14.8709
Toluene (HAP)	0.0656	0.6720	0.6720	2.9431
2,2,4-Trimethylpentane (HAP)	0.0577	0.5911	0.5911	2.5892
Octanes	0.3883	3.9767	3.9767	17.4181
Ethylbenzene (HAP)	0.0122	0.1249	0.1249	0.5470
Xylenes (HAP)	0.0634	0.6494	0.6494	2.8442
Nonanes	0.1974	2.0214	2.0214	8.8538
Decanes Plus	0.1111	1.1380	1.1380	4.9845
Total Weight Percent:	100.0000			
Total TAP Emissions		7.83	7.83	34.29
Total VOC Emissions		**94.01**	**94.01**	**411.76**
Total Non VOC & Non TAP-HC		30.97	30.97	135.64
Total Emissions		1024.06	1024.06	4485.38

Uncontrolled VOC Emission Total (Tons)		Heater Treater Flash Gas	=	**411.76**

Emission Calculations

Emission calculations shown below are presented for informational purposes only as off-gas from the water flash drums is routed to the emergency LP control flare (EPN: 12-07-F) for combustion.

POINT SOURCE I.D. NUMBER: ***19-07-WFD-WG***

EMISSION SOURCE DESCRIPTION: ***Water Flash Drum-Flash Gas***

DATA:

Emission Source:	***Water Flash Drum Flash Gas***
Approx. Pressure Drop of Brine Solution: (psig)	***165***
Approx. Temperature of Brine Solution: (^{0}F)	***70***
Flash Gas Specific Gravity: ***(based on an actual wet gas analysis)***	***1.4172***
Avg. Water Throughput: (BBLD)	***10,000***
Gas to Water Ratio: (SCF/BBL of Water; GWR)	***1.7***
Basis of Emission Estimates:	***API Documentation & Actual Wet Gas Analysis***

Avg. Hourly Uncontrolled Flash Rate (SCF/Hr)	= Brine Rate * GWR	=	**708.33**
Avg. Hourly Uncontrolled Total Flash Emissions (lb/hr)	= Flash Gas Gravity * Density of Air * Flash Rate	=	**76.69**
Max. Hourly Uncontrolled Total Flash Emissions (lb/hr)	= Flash Gas Gravity * Density of Air * Flash Rate	=	**76.69**
Annual Potential Uncontrolled Flash Emissions (TPY)	= Hourly * 8760/2000	=	**335.90**

EMISSION ESTIMATES:

The magnitude of the solubility of natural gas in the interstitial water present in oil sands was studied by The American Petroleum Institute (API) and presented in a 1944 document entitled, "P-V-T and Solubility Relations" (refer to ensuing pages). Results of these studies have been projected to provide estimates of gas volumes present in the brine solution handled at this site within the specific pressure and temperature ranges expected. The composition of this gas is based on an actual wet gas analysis and normalized to account for the presence of H_2S; refer to Southern Petroleum Laboratories Report No.: 172-23080182-003A in ensuing pages.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.1196	0.0917	0.0917	0.4018
Carbon Dioxide (excluded from VOC total)	92.3480	70.8252	70.8252	310.1991
Methane (excluded from VOC total)	4.1413	3.1761	3.1761	13.9106
Ethane (excluded from VOC total)	1.0646	0.8165	0.8165	3.5762
Hydrogen Sulfide (excluded from VOC total)	0.0025	0.0019	0.0019	0.0084
Propane	0.6228	0.4777	0.4777	2.0920
Iso-Butane	0.2073	0.1590	0.1590	0.6964
N-Butane	0.3370	0.2585	0.2585	1.1320

Iso-Pentane	0.2319	0.1778	0.1778	0.7789
N-Pentane	0.1573	0.1206	0.1206	0.5283
Iso-Hexane	0.1692	0.1298	0.1298	0.5684
N-Hexane (TAP)	0.0816	0.0626	0.0626	0.2740
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.0395	0.0303	0.0303	0.1328
Cyclohexane	0.0561	0.0430	0.0430	0.1885
Heptanes	0.1548	0.1187	0.1187	0.5200
Methylcyclohexane	0.0666	0.0511	0.0511	0.2239
Toluene (TAP)	0.0170	0.0131	0.0131	0.0572
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.0806	0.0618	0.0618	0.2707
Ethylbenzene (TAP)	0.0013	0.0010	0.0010	0.0043
Xylenes (TAP)	0.0114	0.0087	0.0087	0.0382
Nonanes	0.0646	0.0495	0.0495	0.2170
Decanes Plus	0.0249	0.0191	0.0191	0.0837
Total Weight Percent:	100.0000			
Total TAP Emissions		0.12	0.12	0.51
Total VOC Emissions		**1.78**	**1.78**	**7.81**
Total Non VOC & Non TAP-HC		3.99	3.99	17.49
Total Emissions		76.69	76.69	335.90

Uncontrolled VOC Emission Total (TPY)	Water Flash Drum Flash Gas	=	**7.81**

Emission Calculations

POINT SOURCE I.D. NUMBERS: ***20-07-FE***

EMISSION SOURCE DESCRIPTION: ***Fugitive Emissions***

DATA:

Emission Source:	***Fugitive from Light Liquid & Gas-Service Components***
Basis of Emission Estimates:	***U.S. EPA***

EMISSION CALCULATIONS:

	Count - by Service			THC Emission Factors [(c)] (kg/hr/source)		Calculated THC Emissions			
						Hourly Emissions (lb/hr)		Total Emissions (Tons)	
	Lt. Liquid	Gas	Total	Lt. Liquid Service	Gas Service	LL	Gas	LL	Gas
Connectors	108	1,922	2030	2.1E-04	2.0E-04	0.050	0.847	0.22	3.71
Flanges	128	0	128	1.1E-04	3.9E-04	0.031	0.000	0.14	0.00
Open Ends	0	66	66	1.4E-03	2.0E-03	0.000	0.291	0.00	1.27
Pumps[(a)]	2		2	1.3E-02	2.4E-03	0.057	N/A	0.25	N/A
Valves	66	710	776	2.5E-03	4.5E-03	0.364	7.044	1.59	30.85
"Others"[(b)]	0	0	0	7.5E-03	8.8E-03	0.000	0.000	0.00	0.00
TOTALS:	**304**	**2,698**	**3,002**			**0.50**	**8.18**	**2.20**	**35.84**

[(a)] Process Pumps Only

[(b)] "Others" equipment derived from compressors, diaphragms, drains, dump arms, hatches, instruments, meters, pressure relief valves, polished rods, relief valves, and vents

[(c)] Refer to EPA Publication No. 453/R-95-017, "Protocol for Equipment Leak Emission Estimates", copy included in ensuing pages

LIGHT LIQUID-SERVICE SPECIATION FACTORS:

Speciation of the emission stream from components in light liquid service was taken from EPA Publication No.: 453/R-95-017; "Protocol for Equipment Leak Emission Estimates" and normalized to account for the presence of H_2S.

EMISSIONS SUMMARY:

Component	Weight Percent	Calculated Emission Rate	
		Avg. Hourly (lb/hr)	Avg. Annual (TPY)
Hydrogen Sulfide (TAP; excluded from VOC total)	0.0024	0.0000	0.0001
NMEHC (expressed as VOC)	29.0353	0.1458	0.6386
Benzene (TAP)	0.0346	0.0002	0.0008
Ethylbenzene (TAP)	0.0000	0.0000	0.0000

Toluene (TAP)	0.0815	0.0004	0.0018
Xylenes (m,p,o) (TAP)	0.0470	0.0002	0.0010
	TOTAL TAP EMISSIONS:	0.00	0.00
	TOTAL VOC EMISSIONS:	**0.15**	**0.64**

GAS SERVICE SPECIATION FACTORS:

Speciation of the emission stream from components in gas service is based on an actual wet gas analysis and normalized to account for the presence of H_2S; refer to Southern Petroleum Laboratories Report No.: 172-23080182-003A in ensuing pages.

EMISSIONS SUMMARY:

Component	Weight Percent	Calculated Emission Rate	
		Avg. Hourly (lb/hr)	Avg. Annual (TPY)
Nitrogen (excluded from VOC total)	0.1196	0.0098	0.0429
Carbon Dioxide (excluded from VOC total)	92.3491	7.5563	33.0964
Methane (excluded from VOC total)	4.1413	0.3389	1.4842
Ethane (excluded from VOC total)	1.0647	0.0871	0.3816
Hydrogen Sulfide (TAP; excluded from VOC total)	0.0013	0.0001	0.0005
Propane	0.6228	0.0510	0.2232
Iso-Butane	0.2073	0.0170	0.0743
N-Butane	0.3370	0.0276	0.1208
Iso-Pentane	0.2319	0.0190	0.0831
N-Pentane	0.1573	0.0129	0.0564
Iso-Hexanes	0.1692	0.0138	0.0606
N-Hexane (TAP)	0.0816	0.0067	0.0292
Methylcyclopentane	0.0000	0.0000	0.0000
Benzene (TAP)	0.0395	0.0032	0.0142
Cyclohexane	0.0561	0.0046	0.0201
Heptanes	0.1548	0.0127	0.0555
Methylcyclohexane	0.0666	0.0055	0.0239
Toluene (TAP)	0.0170	0.0014	0.0061
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000
Octanes	0.0806	0.0066	0.0289
Ethylbenzene (TAP)	0.0013	0.0001	0.0005
Xylenes (TAP)	0.0114	0.0009	0.0041
Nonanes	0.0646	0.0053	0.0231
Decanes Plus	0.0249	0.0020	0.0089
TOTAL WEIGHT PERCENT:	100.0000		
	TOTAL TAP EMISSIONS:	0.01	0.05
	TOTAL VOC EMISSIONS:	**0.19**	**0.83**
	TOTAL Non-VOC & Non-TAP HC:	0.43	1.87
	TOTAL Emissions:	8.18	35.84

Facility-Wide VOC Fugitive Totals	=	**0.34 lb/hr**	**1.47 TPY**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***22-17-GST***

EMISSION SOURCE DESCRIPTION: ***1000 Gallon Gasoline Storage Tank***

DATA:

Emission Source:	***"Working" & "Standing" Losses***
Maximum Gasoline Throughput: **(Gallons/Yr)**	***10,000***
Average VOC Working Losses - L_w (lb/yr):	***125.100***
Average VOC Standing Losses - L_S (lb/yr):	***754.451***
Basis of Estimates:	***AP-42, Chapter 7 (June 2020, Section 7.1.3.1); Refer to ensuing pages for summary***

Avg. Hourly Uncontrolled THC Losses (lb/hr)	=	(Lw + Ls)/8760	=	**0.10**
Max. Hourly Uncontrolled THC Losses (lb/hr)	=	(Lw + Ls)/8760	=	**0.10**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**0.44**

SPECIATION FACTORS:

Speciation factors were taken from "Air Emissions Species Manual - Volume I: Volatile Organic Compound Species Profiles", 2nd edition; Report No.: EPA-450/2-90-001a; pages 261-262; reference ensuing pages.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Ethane	0.08	0.0001	0.0001	0.0004
Propane	1.25	0.0013	0.0013	0.0055
Iso-Butane	9.83	0.0099	0.0099	0.0432
N-Butane	22.95	0.0230	0.0230	0.1009
Iso-Hexane	4.78	0.0048	0.0048	0.0210
N-Hexane (TAP)	1.84	0.0018	0.0018	0.0081
Iso-Pentane	26.79	0.0269	0.0269	0.1178
N-Pentane	8.56	0.0086	0.0086	0.0376
Heptane	0.32	0.0003	0.0003	0.0014
Other VOC	21.56	0.0216	0.0216	0.0948
Benzene (TAP)	0.77	0.0008	0.0008	0.0034
Toluene (TAP)	0.66	0.0007	0.0007	0.0029
2,2,4-Trimethylpentane (TAP)	0.49	0.0005	0.0005	0.0022

Ethylbenzene (TAP)	0.04	0.0000	0.0000	0.0002
Xylenes (mixed isomers) (TAP)	0.15	0.0002	0.0002	0.0007
Total Weight Percent:	100			
Total TAP Emissions		0.00	0.00	0.02
Total VOC Emissions		**0.10**	**0.10**	**0.44**
Total Non VOC & Non TAP-HC		0.00	0.00	0.00
Total Hydrocarbon Emissions		0.68	0.68	0.46

Emission Calculations

POINT SOURCE I.D. NUMBER: ***23-17-DST***

EMISSION SOURCE DESCRIPTION: ***1000 Gallon Diesel Storage Tank***

DATA:

Emission Source:	***"Working" & "Standing" Losses***
Maximum Annual Throughput: (Gallons/Yr)	***10,000***
Average VOC Working Losses - L_w (lb/yr):	***0.290***
Average VOC Standing Losses - L_S (lb/yr):	***0.416***
Basis of Estimates:	***AP-42, Chapter 7 (June 2020, Section 7.1.3.1); Refer to ensuing pages for summary***

Avg. Hourly Uncontrolled THC Losses (lb/hr)	=	(Lw + Ls)/8760	=	**0.00**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**0.00**

For purposes of permitting and/or providing conservative emission estimates, emissions were calculated using Distillate Fuel Oil No. 2 as the stored material for this tank. A tank size of approximately 1,000 gallons and an annual throughput of approximately 10,000 gallons were used in the emissions model in an effort to demonstrate a conservative potential emissions estimate.

Michael Watson
SECRETARY OF STATE

This is not an official certificate of good standing.

Name History

Name	Name Type
DENBURY ONSHORE, LLC	Legal

Business Information

Business Type:	Limited Liability Company
Business ID:	743899
Status:	Good Standing
Effective Date:	12/31/2003
State of Incorporation:	DE
Principal Office Address:	5851 Legacy Circle, Suite 1200 Plano, TX 75024

Registered Agent

Name

CORPORATION SERVICE COMPANY
109 Executive Drive, Suite 3
Madison, MS 39110

Officers & Directors

Name	Title
Alan Rhoades 5320 LEGACY DRIVE PLANO, TX 75024	Organizer
Kathleen D. Ash 5851 Legacy Circle, Suite 1200 Plano, TX 75024	Manager, President
Kathleen A. Bracci 5851 Legacy Circle, Suite 1200 Plano, TX 75024	Manager, Treasurer, Vice President
Robert D. Tracy 5851 Legacy Circle, Suite 1200 Plano, TX 75024	Manager, Secretary, Vice President
David C. Haeberle 5851 Legacy Circle, Suite 1200 Plano, TX 75024	Vice President

Bruce Chalton 5851 Legacy Circle, Suite 1200 Plano, TX 75024	Vice President
Jenny L. Cochran 5851 Legacy Circle, Suite 1200 Plano, TX 75024	Vice President
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Randy Robichaux 5851 Legacy Circle, Suite 1200 Plano, TX 75024	Vice President
Kate M. Ryan 5851 Legacy Circle, Suite 1200 Plano, TX 75024	Vice President
John G. Schnacke 5851 Legacy Circle, Suite 1200 Plano, TX 75024	Vice President
Karl G. Stuckey 5851 Legacy Circle, Suite 1200 Plano, TX 75024	Vice President

Wet Gas

Williston Laboratory
3111 1st Ave W
Williston, ND 58801

Certificate of Analysis

Number: 172-23080182-003A

Aug. 22, 2023

Kevin Hendricks
Denbury
202 S 4th Street West
Baker, MT 59313

Station Name: MS Cranfield EOR Facility
Sample Point: HP Separator
Method: GPA 2286
Cylinder No: 01277
Analyzed: 08/18/2023 11:21:09

Sampled By: John Fielder
Sample Of: Gas Spot
Sample Date: 08/04/2023 14:30
Sample Conditions: 760 psig, @ 103 °F
PO/Ref. No: 4300204782

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.696 psia
Nitrogen	0.1755	0.1196	
Methane	10.6096	4.1413	
Carbon Dioxide	86.2440	92.3506	
Ethane	1.4552	1.0646	0.3903
Propane	0.5805	0.6228	0.1604
Iso-Butane	0.1466	0.2073	0.0481
n-Butane	0.2383	0.3370	0.0753
Iso-Pentane	0.1321	0.2319	0.0484
n-Pentane	0.0896	0.1573	0.0326
Hexanes	0.0807	0.1692	0.0332
n-Hexane	0.0389	0.0816	0.0160
Benzene	0.0208	0.0395	0.0058
Cyclohexane	0.0274	0.0561	0.0094
Heptanes	0.0635	0.1548	0.0294
Methylcyclohexane	0.0279	0.0667	0.0112
Toluene	0.0076	0.0170	0.0026
Octanes	0.0290	0.0806	0.0149
Ethylbenzene	0.0005	0.0013	0.0002
Xylenes	0.0044	0.0113	0.0017
Nonanes	0.0207	0.0646	0.0117
Decanes Plus	0.0072	0.0249	0.0044
	100.0000	100.0000	0.8956

GPM TOTAL C2+ 0.893

Calculated Physical Properties	Total	C10+
Calculated Molecular Weight	41.10	142.28
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.696 psia & 60°F		
Higher Heating Value, Real Gas Dry BTU	187.0	7742.9
Water Sat. Gas Base BTU	183.8	7607.8
Relative Density Real Gas	1.4262	4.9126
Compressibility Factor	0.9946	

Data reviewed by: Ahsenur Kara, Lab Technician 1

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

Normalized Component Calculation

Wet Gas Analysis; Southern Petroleum Laboratories Report No.: 172-23080182-003A

COMPONENT	mole %	mole % w/extra component	COMPONENT MW	Fuel Weight	Normalized WT %	Component BTU/scf	Partial Heating Values
Water	0.0000	0.0000	18	0.00	0.0000	0	0
Nitrogen	0.1755	0.1755	28.0134	0.05	0.1196	0	0
Methane	10.6096	10.6094	16.043	1.70	4.1413	1010	107
Carbon Dioxide	86.2440	86.2426	44.01	37.96	92.3491	0	0
Ethane	1.4552	1.4552	30.07	0.44	1.0647	1770	26
Hydrogen Sulfide	0.0000	0.0000	34.08	0.00	0.0000	637	0
Propane	0.5805	0.5805	44.097	0.26	0.6228	2516	15
I-Butane	0.1466	0.1466	58.123	0.09	0.2073	3252	5
N-Butane	0.2383	0.2383	58.123	0.14	0.3370	3262	8
I-Pentane	0.1321	0.1321	72.15	0.10	0.2319	4001	5
N-Pentane	0.0896	0.0896	72.15	0.06	0.1573	4009	4
Other hexanes	0.0807	0.0807	86.177	0.07	0.1692	4750	4
N-hexane	0.0389	0.0389	86.177	0.03	0.0816	4756	2
Methylcyclopentane	0.0000	0.0000	84.1608	0.00	0.0000	4501	0
benzene	0.0208	0.0208	78.114	0.02	0.0395	3742	1
cyclohexane	0.0274	0.0274	84.1608	0.02	0.0561	4482	1
heptane	0.0635	0.0635	100.204	0.06	0.1548	5503	3
Methylcyclohexane	0.0279	0.0279	98.18	0.03	0.0666	5216	1
toluene	0.0076	0.0076	92.141	0.01	0.0170	4475	0
iso-octane	0.0000	0.0000	114.22	0.00	0.0000	6232	0
octanes	0.0290	0.0290	114.22	0.03	0.0806	7000	2
ethylbenzene	0.0005	0.0005	106.167	0.00	0.0013	5222	0
xylene	0.0044	0.0044	106.167	0.00	0.0114	5208	0
nonanes	0.0207	0.0207	128.25	0.03	0.0646	6997	1
Decanes Plus	0.0072	0.0072	142.28	0.01	0.0249	7743	1
Max Hydrogen Sulfide	0.0016	0.0016	34.08	0.00	0.0013	637	0
TOTALS	**100.0016**	**100.0000**	**MW=**	**41.10**	100.0000	**total btu/scf**	**186.22**
				sg	**1.4172**		
				VOC wt%	**2.3240**		
				Toxic wt%	**0.151**		

DRILLING AND PRODUCTION PRACTICE

1944

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New York 20, N. Y.

1945

To calculate the properties of the interstitial water in the reservoir, it is observed from Table 4 that the change in formation volume of pure water at 3,000 psi, absolute, and 200 deg F (due to the solution of 15.4 cu ft per bbl of gas) is 1.0380 minus 1.0271, or 0.0059 bbl per bbl. As the solubility in the interstitial water is only 13.6 cu ft per bbl, the change in formation volume would be expected to be $\frac{13.6}{15.4}$ (0.0059), or 0.0052. Hence, the formation volume of the interstitial water is calculated to be 1.0271 plus 0.0052, or 1.0323 bbl per bbl. A similar calculation at a reservoir pressure of 2,000 psi, absolute, yields a formation volume of 1.0340 bbl per bbl—which indicates that, even though the interstitial water contains less dissolved gas at 2,000 psi, absolute, than it did at 3,000 psi, absolute, its volume is greater at the lower pressure. This result is interesting, because it is opposite to the behavior of natural-gas–crude-oil mixtures.

The compressibility of the saturated interstitial water is found from Fig. 2 by multiplying the correction factor for the gas solubility, 1.12 for a 13.6-cu-ft-per-bbl mixture, times the compressibility, 3.12 times 10^{-6}, of pure water, which gives 3.50 times 10^{-6} bbl per bbl per lb per sq in.

The use of data on the formation volumes of the saturated interstitial water, together with the data on the compressibilities, permits accurate accounting of the interstitial-water behavior for material-balance calculations when the accuracy of the other data justifies the additional refinement.

TABLE 4

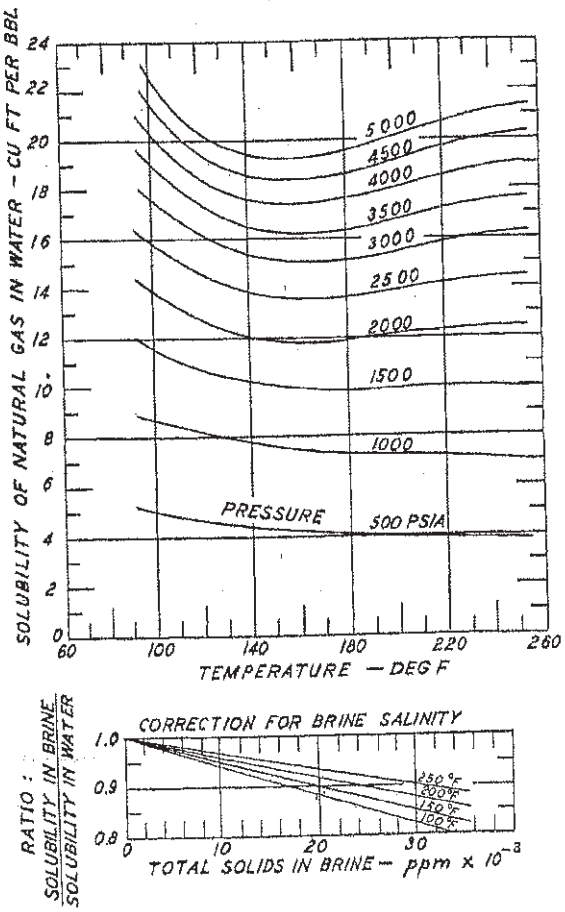
Formation Volumes of Pure Water and Mixtures of Natural Gas and Water

Saturation Pressure (PSI, Absolute)	Formation Volumes—Barrel Per Barrel			
	100 Deg F	150 Deg F	200 Deg F	250 Deg F
	Natural Gas and Water			
5,000	0.9989	1.0126	1.0301	1.0522
4,000	1.0003	1.0140	1.0316	1.0537
3,000	1.0017	1.0154	1.0330	1.0552
2,000	1.0031	1.0168	1.0345	1.0568
1,000	1.0045	1.0183	1.0361	1.0584
Pressure (PSI, Absolute)	Pure Water *			
5,000	0.9910	1.0039	1.0210	1.0418
4,000	0.9938	1.0067	1.0240	1.0452
3,000	0.9966	1.0095	1.0271	1.0487
2,000	0.9995	1.0125	1.0304	1.0523
1,000	1.0025	1.0153	1.0335	1.0560
Vapor pressure of water	1.0056	1.0187	1.0370	1.0598

* See reference No. 3.

Water production from so-called "clean" gas wells or high gas-oil-ratio (distillate) wells may be a combination of the water that exists as vapor in the reservoir gas and liquid water that is brought to the surface by mechanical entrainment in the gas. The water produced by condensation is free of salts, whereas the entrained water may contain a considerable amount of dissolved salts.

The amount of water that will be produced from a well as vapor can be determined from Table 5 and Fig. 3. For example, consider the case of a gas reservoir at 3,000 psi, absolute, and 200 deg F, in which the interstitial water has a salinity of 30,000 ppm. From Table 5 and Fig. 3, the amount of water vapor in the formation gas is shown to be 0.82 bbl per 1,000 MCF of dry gas when vaporized from pure water, or 0.82 times 0.93, which equals 0.76 bbl per 1,000 MCF for the gas in equilibrium with the saline interstitial water. If the foregoing reservoir gas is put through a trap operating at 500 psi, absolute, and 100 deg F, the amount of water which can remain as vapor in the gas at these conditions is shown in Table 5 to be 0.31 bbl per 1,000



Solubility of Natural Gas in Water.

FIG. 1

Tank Emission Calculations Based on AP 42 Chapter 7 (June 2020, Section 7.1.3.1), Fixed Roof

Tank ID	**2a-07-OST-CV**
Tank Description	**5000 BBL Dry Oil Tank-Common Vent (ABJ-119A)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**38.70**
Vertical Height/Horizontal Length (H_S ft)	**24.00**
Roof Height (H_R ft)	**1.21**
Max Liquid Height (H_{LX} ft)	**23.00**
Avg Liquid Height (H_L ft)	**11.50**
Breather Vent Pressure Setting (P_{BP} psig)	
Breather Vent Vacuum Setting (P_{BV} psig)	
actual tank pressure (P_I psig)	**0.0**
Shell Paint Solar Absorptance (S_A)	**0.64**
Roof Paint Solar Absorptance (R_A)	**0.64**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.4031**

Tank Shell Color/Shade	**Aluminum - Diffuse**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Aluminum - Diffuse**
Tank Roof Paint Condition	**average**
Roof Type	**vertical tank with cone roof**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**1,095,000.00**
Annual Turnovers, N	**227.22**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**27,054.51**
vapor space outage (H_{VO} ft)	**12.903**
vapor space volume (V_V ft^3)	**15,177.73**

Major City for Meterological Data	**Jackson, MS**
Site Elevation (ft)	**300**
Atmospheric Pressure (P_A psia)	**14.537**
Table 7.1-2 Liquid	**crude oil**
*RVP**	**6.18**
*API gravity**	**40.5**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**40.5**
API gravity at 100F	**44.0**
Working Loss Product Factor (K_P)	**0.75**
working loss turnover factor K_N	**1.000**

*sales oil data determines RVP per API pub 4683

Tank contents (if not selected from Table 7.1-2):

component	*mole%*	*MW*	*lb/mole*	*wt%*	*Antoine constants (log_{10}, mmHg, °C) A*	*B*	*C*
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
	0.000		0.000	0.000			

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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
hourly average maximum ambient temperature (T_{AX} °F)	56.50	60.80	68.10	75.70	83.00	89.00	91.10	91.20	86.50	77.10	66.30	58.10	75.30
hourly average minimum ambient temperature (T_{AN} °F)	37.00	39.30	45.90	53.30	62.50	69.20	72.10	71.40	65.50	53.90	43.90	37.90	54.30
daily total solar insolation factor (I btu/ft^2 day)	783	1039	1369	1762	1929	2025	1969	1849	1576	1262	922	726	1434
daily average ambient temperature (T_{AA} °F)	46.75	50.05	57.00	64.50	72.75	79.10	81.60	81.30	76.00	65.50	55.10	48.00	64.80
liquid bulk temperature (T_B °F)	48.25	52.04	59.63	67.88	76.45	82.99	85.38	84.85	79.03	67.92	56.87	49.39	67.55
average vapor temperature (T_V °F)	51.58	56.46	65.44	75.37	84.65	91.59	93.75	92.71	85.72	73.28	60.79	52.48	73.65
daily ambient temperature range (ΔT_A °R)	19.50	21.50	22.20	22.40	20.50	19.80	19.00	19.80	21.00	23.20	22.40	20.20	21.00
daily vapor temperature range (ΔT_V °R)	23.67	28.35	33.06	38.23	39.04	39.78	38.50	37.53	34.87	32.39	27.48	23.52	33.06
daily average liquid surface temperature (T_{LA} °F)	49.92	54.25	62.54	71.63	80.55	87.29	89.56	88.78	82.37	70.60	58.83	50.94	70.60
daily maximum liquid surface temperature (T_{LX} °F)	55.83	61.34	70.80	81.18	90.31	97.23	99.19	98.16	91.09	78.70	65.70	56.82	78.86
daily minimum liquid surface temperature (T_{LN} °F)	44.00	47.16	54.27	62.07	70.79	77.34	79.94	79.40	73.66	62.51	51.96	45.06	62.34
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	3.174	3.451	4.033	4.758	5.566	6.245	6.488	6.403	5.744	4.671	3.763	3.238	4.671
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	3.556	3.944	4.688	5.627	6.570	7.364	7.601	7.475	6.656	5.390	4.274	3.623	5.405
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	2.825	3.008	3.452	3.998	4.687	5.264	5.507	5.456	4.933	4.030	3.302	2.885	4.018
daily vapor pressure range (ΔP_V)	0.7309	0.9360	1.2359	1.6295	1.8827	2.0996	2.0935	2.0194	1.7230	1.3600	0.9719	0.7378	1.3878
vapor space expansion factor (K_E)	0.1108	0.1396	0.1810	0.2386	0.2821	0.3259	0.3302	0.3167	0.2603	0.1989	0.1432	0.1114	0.2030
vapor molecular weight (M_V lb/lbmole)	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
monthly hours with avg = total annual	744	672	744	720	744	720	744	744	720	744	720	744	8,760
throughputs (ft^3/month) and avg = total annual	522,102	471,576	522,102	505,260	522,102	505,260	522,102	522,102	505,260	522,102	505,260	522,102	6,147,330
monthly turnovers (N/month) with avg = total annual	19.30	17.43	19.30	18.68	19.30	18.68	19.30	19.30	18.68	19.30	18.68	19.30	227.22
vented vapor saturation factor (K_S)	0.3154	0.2976	0.2661	0.2351	0.2081	0.1897	0.1839	0.1859	0.2029	0.2384	0.2798	0.3111	0.2384
vent setting correction factor (K_B)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
vapor density (W_V lb/ft^3)	0.0289	0.0312	0.0358	0.0414	0.0476	0.0528	0.0546	0.0540	0.0491	0.0408	0.0337	0.0295	0.0408
standing storage losses (L_S lb/month & avg is lb/yr)	658.78	640.76	814.83	913.06	1085.00	1163.24	1243.95	1230.01	1081.38	930.00	742.47	670.76	11174.24
working losses (L_W lb/month & avg is lb/yr)	11327.84	11017.98	14011.04	15700.19	18656.76	20002.08	21389.94	21150.10	18594.38	15991.48	12766.88	11533.79	192142.45
total losses (L_T lb/month & avg is lb/yr)	11986.62	11658.74	14825.87	16613.25	19741.76	21165.32	22633.89	22380.11	19675.76	16921.48	13509.35	12204.55	203316.69
max hourly Q in bbl/hour	701.75	701.75	701.75	701.75	701.75	701.75	701.75	701.75	701.75	701.75	701.75	701.75	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	15.226	16.396	18.832	21.806	25.076	27.781	28.750	28.428	25.826	21.494	17.732	15.502	
breathing/standing loss (L_S lb/hr)	0.885	0.954	1.095	1.470	1.769	2.064	2.098	2.011	1.639	1.250	1.031	0.902	
max hourly total loss (L_T lb/hr)	16.111	17.349	19.927	23.276	26.845	29.845	30.848	30.439	27.465	22.744	18.763	16.404	

L_S sum months	L_W sum months	L_T sum months
11174.24	192142.45	203316.69

The monthly sums will be greater than the annual average since the monthly variables yield higher emissions

Emissions Summary:	avg lbs/hr	max lbs/hr	lbs/yr
Standing/Breathing Loss L_S	**1.249**	**2.098**	**10,941.731**
Working Loss L_W	**21.478**	**28.750**	**188,144.451**
Total Loss L_T	**22.727**	**30.848**	**199,086.182**

max hourly total loss may not add up to L_S + L_W as their max values may be in different months

VOC Profile Speciation Report

Profile Name : Fixed Roof Tank - Crude Oil Production
Profile Number : 0296
Data Quality : C

Control Device : Uncontrolled
Reference(s) : 59, 72
Data Source : Engineering evaluation of test data and literature data

SCC Assignments: 40301010, 40301011, 40301012, 40301109

Saroad	CAS Number	Name	Spec_MW	Spec_WT	Peak
43115		C-7 CYCLOPARAFFINS	98.19	1.30	
43116		C-8 CYCLOPARAFFINS	112.23	0.50	
43122		ISOMERS OF PENTANE	72.15	1.50	
43201	74-82-8	METHANE	16.04	6.20	
43202	74-84-0	ETHANE	30.07	5.60	
43204	74-98-6	PROPANE	44.09	17.60	
43212	106-97-8	N-BUTANE	58.12	27.10	
43214	75-28-5	ISO-BUTANE	58.12	1.50	
43220	109-66-0	N-PENTANE	72.15	14.60	
43231	110-54-3	HEXANE	86.17	7.90	
43232	142-82-5	HEPTANE	100.20	9.20	
43233	111-65-9	OCTANE	114.23	6.90	
45201	71-43-2	BENZENE	78.11	0.10	
TOTAL				100.00	

Normalized Component Calculation

Storage Vapor Speciation - Dry Oil Tank

COMPONENT	mole %	mole % w/extra component	COMPONENT MW	fuel weight	Normalized WT %	component BTU/scf	partial Heating values
Water	0.0000	0.0000	18	0.00	**0.0000**	0	0
Nitrogen	0.0000	0.0000	28.0134	0.00	**0.0000**	0	0
Methane	19.8195	19.8185	16.043	3.18	**6.1995**	1010	200
Carbon Dioxide	0.0000	0.0000	44.01	0.00	**0.0000**	0	0
Ethane	9.5505	9.5500	30.07	2.87	**5.5993**	1770	169
Hydrogen Sulfide	0.0000	0.0000	34.08	0.00	**0.0000**	637	0
Propane	20.4700	20.4690	44.097	9.03	**17.5997**	2516	515
I-Butane	1.3240	1.3239	58.123	0.77	**1.5004**	3252	43
N-Butane	23.9130	23.9118	58.123	13.90	**27.0994**	3262	780
I-Pentane	1.0660	1.0659	72.15	0.77	**1.4996**	4001	43
N-Pentane	10.3780	10.3775	72.15	7.49	**14.5991**	4009	416
Other hexanes	0.0000	0.0000	86.177	0.00	**0.0000**	4750	0
N-hexane	4.7020	4.7018	86.177	4.05	**7.9004**	4756	224
Methylcyclopentane	0.0000	0.0000	84.1608	0.00	**0.0000**	4501	0
benzene	0.0660	0.0660	78.114	0.05	**0.1005**	3742	2
cyclohexane	0.0000	0.0000	84.1608	0.00	**0.0000**	4482	0
heptane	4.7090	4.7088	100.204	4.72	**9.2001**	5503	259
Methylcyclohexane	0.0000	0.0000	98.18	0.00	**0.0000**	5216	0
toluene	0.0000	0.0000	92.141	0.00	**0.0000**	4475	0
iso-octane	0.0000	0.0000	114.22	0.00	**0.0000**	6232	0
octanes	3.0980	3.0978	114.22	3.54	**6.8992**	7000	217
ethylbenzene	0.0000	0.0000	106.167	0.00	**0.0000**	5222	0
xylene	0.0000	0.0000	106.167	0.00	**0.0000**	5208	0
nonanes	0.0000	0.0000	128.25	0.00	**0.0000**	6997	0
Other NM/NE HC	0.9040	0.9040	102.09	0.92	**1.7994**	5200	47
Max Hydrogen Sulfide	0.0050	0.0050	34.08	0.00	**0.0033**	637	0
TOTALS	**100**	**100**	**MW=**	**51.29**	**100.0000**	**total btu/scf**	**2915.04**
				sg	**1.7685**		
				VOC wt%	**88.1979**		
				Toxic wt%	**8.001**		

Oil Flash

SPL, Inc.
3111 1st Ave W
Williston, ND 58801
701-368-7183

Flash Liberation of Hydrocarbon Liquid Study

Client:	Denbury	Sample Lab ID:	23080182-006A
Facility:	MS Cranfield EOR Facility	Facility Well:	Not Indicated
Equipment:	Not Indicated	Sample Source:	Vessel Dump- Oil Treater EOR
Unique Number:	Not Indicated	Analyst:	JMC
Date Sampled:	08/04/23	Date Analyzed:	08/18/23
State:	ND	Site Notes:	
County:	Not Indicated		

Flash Liberation of Hydrocarbon Liquid Conditions

	Pressure (psig)	Temperature (°F)
Separator Hydrocarbon Liquid	50.0	120.0
Stock Tank	0.0	60.0

Base Conditions

	Condition	Units/Description
Base Conditions, Pressure	14.73	psi

Flash Liberation of Hydrocarbon Liquid Results

	Result	Units/Description
Gas Oil Ratio	27.60	SCF flashed vapor/bbl stock tank oil
Gas Oil Ratio	3.218	lb flashed vapor/bbl stock tank oil
Gas Specific Gravity	1.524	Air = 1.000
Separator Volume Factor	1.071	Separator Volume/Stock tank Volume

Stock Tank Fluid Properties

	Result	Units/Description
Shrinkage Recovery Factor	0.9341	Fraction of first stage separator liquid
Oil API Gravity at 60 °F	40.52	
Oil API Gravity, observed	40.52	at 59.95°F
Specific Gravity at 60 °F	0.8226	ASTM D7777, Measured
Reid Vapor Pressure, psi	3.74	Absolute Pressure at 100°F by D5191

Cylinder Pressure Check

	Pressure (psi)	Temperature (°F)
Sample Conditions	50.0	120.0
Test Sample	36.0	77.8

Quality Control Summary

Duplicate Results		Acceptable Range
Gas Oil Ratio (% difference)	0.6	<5%
Separator Volume Factor (% difference)	0.4	<5%
Shrinkage Recovery Factor (% difference)	0.4	<5%
Cylinder Type	Piston	
Cylinder Size (cc)	500	
Cylinder Number	294	
Sample Collection Rate (mL/min)	47	<50 mL/min

SPL, Inc.
3111 1st Ave W
Williston, ND 58801
701-368-7183

Gas Evolved from Flashed Hydrocarbon Liquid

Analyst:	JMC	**Analysis Date**	8/18/2023
Client:	Denbury	**Date Sampled:**	8/18/2023
Facility:	MS Cranfield EOR Facility	**Purpose:**	Flash Gas Analysis
Equipment:	Not Indicated	**Sample Source:**	.ast Vessel Dump- Oil Treater EOR
Unique #:	Not Indicated	**Pressure:**	Ambient
Sample Temperature:	70°F	**Type Sample:**	Spot
Sampled by:	JMC	**County:**	Not Indicated

COMPONENT	MOLE %	GPM
Nitrogen	1.189	
Carbon Dioxide	81.513	
Methane	3.150	
Ethane	3.741	1.007
Propane	4.134	1.147
Isobutane	1.309	0.431
n-Butane	2.171	0.689
Isopentane	1.026	0.378
n-Pentane	0.663	0.242
Hexanes	0.718	0.260
Heptanes Plus	0.386	0.165
Totals	100.000	4.319

Specific Gravity	1.524		
Compressibility (Z)	0.9928		
Molecular Weight	43.85		
Saturated Ideal BTUs	427.8	Saturated Real BTUs	430.9
Dry Ideal BTUs	435.4	Dry Real BTUs	438.6
Base Conditions:	14.73 psi, 60 °F		

Gas Evolved from Flashed Hydrocarbon Liquid
Extended Analysis Report

COMPONENT	MOLE %	BTU	GPM	WT %
Nitrogen	1.189			0.760
Carbon Dioxide	81.515			81.815
Methane	3.150	31.889		1.153
Ethane	3.741	66.357	1.007	2.566
Propane	4.134	104.257	1.147	4.158
Isobutane	1.309	42.665	0.431	1.735
n-Butane	2.171	70.989	0.689	2.878
Isopentane	1.026	41.144	0.378	1.688
n-Pentane	0.663	26.639	0.242	1.091
2,2-Dimethylbutane	0.032	1.520	0.013	0.063
Cyclopentane	0.031	1.159	0.009	0.049
2,3-Dimethylbutane	0.036	1.370	0.011	0.058
2-Methylpentane	0.245	9.240	0.073	0.392
3-Methylpentane	0.127	6.047	0.052	0.250
n-Hexane	0.247	11.774	0.102	0.485
Methylcyclopentane	0.080	4.428	0.037	0.183
Benzene	0.024	0.900	0.007	0.043
Cyclohexane	0.079	3.549	0.027	0.152
2-Methylhexane	0.003	0.178	0.001	0.007
3-Methylhexane	0.002	0.123	0.001	0.005
2,2,4-Trimethylpentane	0.000	0.000	0.000	0.000
Other Heptanes	0.005	0.279	0.002	0.012
n-Heptane	0.110	6.077	0.051	0.252
Methylcyclohexane	0.029	1.517	0.012	0.065
Toluene	0.006	0.269	0.002	0.013
Other Octanes	0.020	1.262	0.010	0.053
n-Octane	0.011	0.679	0.006	0.028
Ethylbenzene	0.000	0.000	0.000	0.000
m,p-Xylene	0.002	0.103	0.001	0.005
o-Xylene	0.000	0.000	0.000	0.000
Other Nonanes	0.008	0.547	0.005	0.023
n-Nonane	0.004	0.295	0.002	0.012
Other Decanes	0.001	0.109	0.001	0.004
n-Decane	0.000	0.031	0.000	0.001
Undecanes+	0.000	0.016	0.000	0.001
Totals	100.000	435.4	4.319	100.000

Specific Gravity	1.524		
Compressibility (Z)	0.993		
Molecular Weight	43.846		
Saturated Ideal BTUs	427.8	Saturated Real BTUs	430.9
Dry Ideal BTUs	435.4	Dry Real BTUs	438.6

Base Conditions:	14.73 psi, 60 °F	
HAP Weight Fraction		**0.0055**
VOC Weight Fraction		**0.1367**
Higher Heating Value (BTU/ft^3)		**435.4**
Lower Heating Value (BTU/ft^3)		**400.7**

Normalized Component Calculation

Dry Oil Tank Oil Flash Analysis; Southern Petroleum Laboratories Report No.: 23080182-006A

COMPONENT	mole %	mole % w/extra component	COMPONENT MW	Fuel Weight	Normalized WT %	Component BTU/scf	Partial Heating Values
Water	0.0000	0.0000	18	0.00	0.0000	0	0
Nitrogen	1.1890	1.1889	28.0134	0.33	0.7591	0	0
Methane	3.1500	3.1498	16.043	0.51	1.1517	1010	32
Carbon Dioxide	81.5150	81.5109	44.01	35.87	81.7572	0	0
Ethane	3.7410	3.7408	30.07	1.12	2.5636	1770	66
Hydrogen Sulfide	0.0000	0.0000	34.08	0.00	0.0000	637	0
Propane	4.1340	4.1338	44.097	1.82	4.1545	2516	104
I-Butane	1.3090	1.3089	58.123	0.76	1.7339	3252	43
N-Butane	2.1710	2.1709	58.123	1.26	2.8757	3262	71
I-Pentane	1.0570	1.0569	72.15	0.76	1.7380	4001	42
N-Pentane	0.6630	0.6630	72.15	0.48	1.0902	4009	27
Other hexanes	0.4400	0.4400	86.177	0.38	0.8641	4750	21
N-hexane	0.2470	0.2470	86.177	0.21	0.4851	4756	12
Methylcyclopentane	0.0800	0.0800	84.1608	0.07	0.1534	4501	4
benzene	0.0240	0.0240	78.114	0.02	0.0427	3742	1
cyclohexane	0.0790	0.0790	84.1608	0.07	0.1515	4482	4
heptane	0.1200	0.1200	100.204	0.12	0.2740	5503	7
Methylcyclohexane	0.0290	0.0290	98.18	0.03	0.0649	5216	2
toluene	0.0060	0.0060	92.141	0.01	0.0126	4475	0
iso-octane	0.0200	0.0200	114.22	0.02	0.0521	6232	1
octanes	0.0110	0.0110	114.22	0.01	0.0286	7000	1
ethylbenzene	0.0000	0.0000	106.167	0.00	0.0000	5222	0
xylene	0.0020	0.0020	106.167	0.00	0.0048	5208	0
nonanes	0.0120	0.0120	128.25	0.02	0.0351	6997	1
Decanes Plus	0.0010	0.0010	142.28	0.00	0.0032	7743	0
Max Hydrogen Sulfide	0.0050	0.0050	34.08	0.00	0.0039	637	0
TOTALS	**100.0050**	**100.0000**	**MW=**	**43.88**	100.0000	**total btu/scf**	**436.41846**
				sg	**1.5130**		
				VOC wt%	**13.7645**		
				Toxic wt%	**0.597**		

Tank Emission Calculations Based on AP 42 Chapter 7 (June 2020, Section 7.1.3.1), Fixed Roof

Tank ID	**3-07-OST-V**
Tank Description	**1500 BBL Wet Oil Tank-Common Vent (BBJ-118)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**21.50**
Vertical Height/Horizontal Length (H_S ft)	**24.00**
Roof Height (H_R ft)	**0.67**
Max Liquid Height (H_{LX} ft)	**23.00**
Avg Liquid Height (H_L ft)	**11.50**
Breather Vent Pressure Setting (P_{BP} psig)	
Breather Vent Vacuum Setting (P_{BV} psig)	
actual tank pressure (P_I psig)	**0.0**
Shell Paint Solar Absorptance (S_A)	**0.64**
Roof Paint Solar Absorptance (R_A)	**0.64**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.2240**

Tank Shell Color/Shade	**Aluminum - Diffuse**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Aluminum - Diffuse**
Tank Roof Paint Condition	**average**
Roof Type	**vertical tank with cone roof**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**3,650.00**
Annual Turnovers, N	**2.45**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**8,350.16**
vapor space outage (H_{VO} ft)	**12.724**
vapor space volume (V_V ft^3)	**4,619.44**

Major City for Meterological Data	**Jackson, MS**
Site Elevation (ft)	**300**
Atmospheric Pressure (P_A psia)	**14.537**
Table 7.1-2 Liquid	**crude oil**
*RVP**	**6.18**
*API gravity**	**40.5**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**40.5**
API gravity at 100F	**44.0**
Working Loss Product Factor (K_P)	**0.75**
working loss turnover factor K_N	**1.000**

*sales oil data determines RVP per API pub 4683

Tank contents (if not selected from Table 7.1-2):

component	*mole%*	*MW*	*lb/mole*	*wt%*	*Antoine constants (log_{10}, mmHg, °C) A*	*B*	*C*
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
	0.000		0.000	0.000			

HLP engineering, inc.
A Professional Environmental Firm

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
hourly average maximum ambient temperature (T_{AX} °F)	56.50	60.80	68.10	75.70	83.00	89.00	91.10	91.20	86.50	77.10	66.30	58.10	75.30
hourly average minimum ambient temperature (T_{AN} °F)	37.00	39.30	45.90	53.30	62.50	69.20	72.10	71.40	65.50	53.90	43.90	37.90	54.30
daily total solar insolation factor (I btu/ft^2 day)	783	1039	1369	1762	1929	2025	1969	1849	1576	1262	922	726	1434
daily average ambient temperature (T_{AA} °F)	46.75	50.05	57.00	64.50	72.75	79.10	81.60	81.30	76.00	65.50	55.10	48.00	64.80
liquid bulk temperature (T_B °F)	48.25	52.04	59.63	67.88	76.45	82.99	85.38	84.85	79.03	67.92	56.87	49.39	67.55
average vapor temperature (T_V °F)	51.11	55.84	64.63	74.31	83.50	90.38	92.57	91.60	84.78	72.53	60.24	52.04	72.79
daily ambient temperature range (ΔT_A °R)	19.50	21.50	22.20	22.40	20.50	19.80	19.00	19.80	21.00	23.20	22.40	20.20	21.00
daily vapor temperature range (ΔT_V °R)	24.09	28.39	33.06	38.23	39.04	39.78	38.50	37.53	34.87	32.39	27.91	24.07	33.06
daily average liquid surface temperature (T_{LA} °F)	49.68	53.94	62.13	71.10	79.97	86.68	88.97	88.22	81.90	70.23	58.55	50.72	70.17
daily maximum liquid surface temperature (T_{LX} °F)	55.70	61.04	70.39	80.66	89.73	96.63	98.60	97.61	90.62	78.32	65.53	56.74	78.43
daily minimum liquid surface temperature (T_{LN} °F)	43.66	46.84	53.86	61.54	70.21	76.74	79.35	78.84	73.18	62.13	51.58	44.70	61.91
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	3.160	3.430	4.002	4.713	5.511	6.181	6.424	6.344	5.697	4.640	3.744	3.224	4.635
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	3.548	3.922	4.654	5.576	6.507	7.291	7.529	7.408	6.604	5.355	4.261	3.618	5.365
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	2.807	2.989	3.425	3.959	4.639	5.208	5.451	5.403	4.892	4.002	3.278	2.865	3.986
daily vapor pressure range (ΔP_V)	0.7411	0.9330	1.2285	1.6175	1.8681	2.0828	2.0774	2.0048	1.7121	1.3528	0.9830	0.7524	1.3794
vapor space expansion factor (K_E)	0.1124	0.1393	0.1800	0.2367	0.2793	0.3221	0.3263	0.3132	0.2581	0.1978	0.1449	0.1137	0.2017
vapor molecular weight (M_V lb/lbmole)	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
monthly hours with avg = total annual	744	672	744	720	744	720	744	744	720	744	720	744	8,760
throughputs (ft^3/month) and avg = total annual	1,740	1,572	1,740	1,684	1,740	1,684	1,740	1,740	1,684	1,740	1,684	1,740	20,491
monthly turnovers (N/month) with avg = total annual	0.21	0.19	0.21	0.20	0.21	0.20	0.21	0.21	0.20	0.21	0.20	0.21	2.45
vented vapor saturation factor (K_S)	0.3194	0.3018	0.2704	0.2393	0.2120	0.1935	0.1875	0.1895	0.2065	0.2422	0.2837	0.3150	0.2424
vent setting correction factor (K_B)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
vapor density (W_V lb/ft^3)	0.0288	0.0310	0.0356	0.0411	0.0473	0.0524	0.0542	0.0536	0.0488	0.0406	0.0336	0.0294	0.0406
standing storage losses (L_S lb/month & avg is lb/yr)	201.79	196.05	248.99	278.61	330.94	354.74	379.47	375.38	330.32	284.37	227.31	205.51	3413.48
working losses (L_W lb/month & avg is lb/yr)	37.62	36.55	46.42	51.95	61.70	66.14	70.75	69.99	61.59	53.02	42.38	38.32	636.43
total losses (L_T lb/month & avg is lb/yr)	239.41	232.60	295.41	330.55	392.64	420.88	450.22	445.37	391.91	337.39	269.69	243.83	4049.91
max hourly Q in bbl/hour	2.34	2.34	2.34	2.34	2.34	2.34	2.34	2.34	2.34	2.34	2.34	2.34	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.051	0.054	0.062	0.072	0.083	0.092	0.095	0.094	0.086	0.071	0.059	0.052	
breathing/standing loss (L_S lb/hr)	0.271	0.292	0.335	0.448	0.539	0.628	0.638	0.612	0.500	0.382	0.316	0.276	
max hourly total loss (L_T lb/hr)	0.322	0.346	0.397	0.521	0.622	0.720	0.733	0.706	0.586	0.453	0.375	0.328	

L_S sum months	L_W sum months	L_T sum months
3413.48	636.43	4049.91

The monthly sums will be greater than the annual average since the monthly variables yield higher emissions

Emissions Summary:	**avg lbs/hr**	**max lbs/hr**	**lbs/yr**
Standing/Breathing Loss L_S	**0.382**	**0.638**	**3,343.250**
Working Loss L_W	**0.071**	**0.095**	**623.339**
Total Loss L_T	**0.453**	**0.733**	**3,966.588**

max hourly total loss may not add up to L_S + L_W as their max values may be in different months

Normalized Component Calculation

Storage Vapor Speciation - Tanks

COMPONENT	mole %	mole % w/extra component	COMPONENT MW	fuel weight	Normalized WT %	component BTU/scf	partial Heating values
Water	0.0000	0.0000	18	0.00	**0.0000**	0	0
Nitrogen	0.0000	0.0000	28.0134	0.00	**0.0000**	0	0
Methane	19.8195	19.8192	16.043	3.18	**6.1996**	1010	200
Carbon Dioxide	0.0000	0.0000	44.01	0.00	**0.0000**	0	0
Ethane	9.5505	9.5503	30.07	2.87	**5.5995**	1770	169
Hydrogen Sulfide	0.0000	0.0000	34.08	0.00	**0.0000**	637	0
Propane	20.4700	20.4697	44.097	9.03	**17.6001**	2516	515
I-Butane	1.3240	1.3240	58.123	0.77	**1.5005**	3252	43
N-Butane	23.9130	23.9126	58.123	13.90	**27.1000**	3262	780
I-Pentane	1.0660	1.0660	72.15	0.77	**1.4996**	4001	43
N-Pentane	10.3780	10.3778	72.15	7.49	**14.5995**	4009	416
Other hexanes	0.0000	0.0000	86.177	0.00	**0.0000**	4750	0
N-hexane	4.7020	4.7019	86.177	4.05	**7.9006**	4756	224
Methylcyclopentane	0.0000	0.0000	84.1608	0.00	**0.0000**	4501	0
benzene	0.0660	0.0660	78.114	0.05	**0.1005**	3742	2
cyclohexane	0.0000	0.0000	84.1608	0.00	**0.0000**	4482	0
heptane	4.7090	4.7089	100.204	4.72	**9.2003**	5503	259
Methylcyclohexane	0.0000	0.0000	98.18	0.00	**0.0000**	5216	0
toluene	0.0000	0.0000	92.141	0.00	**0.0000**	4475	0
iso-octane	0.0000	0.0000	114.22	0.00	**0.0000**	6232	0
octanes	3.0980	3.0980	114.22	3.54	**6.8994**	7000	217
ethylbenzene	0.0000	0.0000	106.167	0.00	**0.0000**	5222	0
xylene	0.0000	0.0000	106.167	0.00	**0.0000**	5208	0
nonanes	0.0000	0.0000	128.25	0.00	**0.0000**	6997	0
Other NM/NE HC	0.9040	0.9040	102.09	0.92	**1.7994**	5200	47
Max Hydrogen Sulfide	0.0016	0.0016	34.08	0.00	**0.0011**	637	0
TOTALS	**100**	**100**	**MW=**	**51.29**	**100.0000**	**total btu/scf**	**2915.11**
				sg	**1.7685**		
				VOC wt%	**88.1998**		
				Toxic wt%	**8.001**		

Tank Emission Calculations Based on AP 42 Chapter 7 (June 2020, Section 7.1.3.1), Fixed Roof

Tank ID	**4a-07-ST-CV**
Tank Description	**2000 BBL Skimmer Tank-Common Vent (ABJ-120A)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**21.50**
Vertical Height/Horizontal Length (H_S ft)	**32.00**
Roof Height (H_R ft)	**0.67**
Max Liquid Height (H_{LX} ft)	**31.00**
Avg Liquid Height (H_L ft)	**15.50**
Breather Vent Pressure Setting (P_{BP} psig)	
Breather Vent Vacuum Setting (P_{BV} psig)	
actual tank pressure (P_I psig)	**0.0**
Shell Paint Solar Absorptance (S_A)	**0.64**
Roof Paint Solar Absorptance (R_A)	**0.64**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.2240**

Tank Shell Color/Shade	**Aluminum - Diffuse**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Aluminum - Diffuse**
Tank Roof Paint Condition	**average**
Roof Type	**vertical tank with cone roof**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**3,653,650.00**
Annual Turnovers, N	**1822.51**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**11,254.56**
vapor space outage (H_{VO} ft)	**16.724**
vapor space volume (V_V ft^3)	**6,071.64**

Major City for Meterological Data	**Jackson, MS**
Site Elevation (ft)	**300**
Atmospheric Pressure (P_A psia)	**14.537**
Table 7.1-2 Liquid	
*RVP**	**6.18**
*API gravity**	**40.5**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**40.5**
API gravity at 100F	**44.0**
Working Loss Product Factor (K_P)	**0.75**
working loss turnover factor K_N	**1.000**

*sales oil data determines RVP per API pub 4683

Tank contents (if not selected from Table 7.1-2):

component	*mole%*	*MW*	*lb/mole*	*wt%*	*Antoine constants (log_{10}, mmHg, °C) A*	*B*	*C*
Crude Oil	0.100	50.000	0.04995	0.27678	11.059	5046.859	0.000
Water	99.900	18.015	17.99700	99.72322	8.108	1750.300	235.000
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
	100.000		18.047	100.000			

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	Jan	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Avg*
hourly average maximum ambient temperature (T_{AX} °F)	56.50	60.80	68.10	75.70	83.00	89.00	91.10	91.20	86.50	77.10	66.30	58.10	75.30
hourly average minimum ambient temperature (T_{AN} °F)	37.00	39.30	45.90	53.30	62.50	69.20	72.10	71.40	65.50	53.90	43.90	37.90	54.30
daily total solar insolation factor (I btu/ft^2 day)	783	1039	1369	1762	1929	2025	1969	1849	1576	1262	922	726	1434
daily average ambient temperature (T_{AA} °F)	46.75	50.05	57.00	64.50	72.75	79.10	81.60	81.30	76.00	65.50	55.10	48.00	64.80
liquid bulk temperature (T_B °F)	48.25	52.04	59.63	67.88	76.45	82.99	85.38	84.85	79.03	67.92	56.87	49.39	67.55
average vapor temperature (T_V °F)	50.89	55.54	64.24	73.82	82.95	89.81	92.01	91.08	84.33	72.17	59.97	51.84	72.38
daily ambient temperature range (ΔT_A °R)	19.50	21.50	22.20	22.40	20.50	19.80	19.00	19.80	21.00	23.20	22.40	20.20	21.00
daily vapor temperature range (ΔT_V °R)	24.30	28.55	33.06	38.23	39.04	39.78	38.50	37.53	34.87	32.39	28.14	24.32	33.06
daily average liquid surface temperature (T_{LA} °F)	49.57	53.79	61.93	70.85	79.70	86.40	88.70	87.96	81.68	70.05	58.42	50.62	69.97
daily maximum liquid surface temperature (T_{LX} °F)	55.65	60.93	70.20	80.41	89.46	96.34	98.32	97.35	90.40	78.15	65.46	56.70	78.23
daily minimum liquid surface temperature (T_{LN} °F)	43.50	46.66	53.67	61.29	69.94	76.45	79.07	78.58	72.96	61.95	51.39	44.54	61.70
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	0.178	0.208	0.278	0.378	0.507	0.629	0.676	0.661	0.541	0.368	0.246	0.185	0.367
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	0.222	0.268	0.370	0.519	0.693	0.857	0.909	0.883	0.713	0.482	0.314	0.231	0.483
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	0.142	0.160	0.207	0.272	0.367	0.456	0.497	0.489	0.406	0.278	0.190	0.147	0.276
daily vapor pressure range (ΔP_V)	0.0806	0.1088	0.1630	0.2472	0.3260	0.4006	0.4126	0.3940	0.3073	0.2039	0.1241	0.0835	0.2076
vapor space expansion factor (K_E)	0.0533	0.0632	0.0748	0.0895	0.0956	0.1016	0.1000	0.0969	0.0864	0.0755	0.0630	0.0535	0.0771
vapor molecular weight (M_V lb/lbmole)	18.58	18.54	18.47	18.41	18.36	18.33	18.32	18.32	18.35	18.42	18.50	18.57	18.42
monthly hours with avg = total annual	744	672	744	720	744	720	744	744	720	744	720	744	8,760
throughputs (ft^3/month) and avg = total annual	1,742,080	1,573,492	1,742,080	1,685,884	1,742,080	1,685,884	1,742,080	1,742,080	1,685,884	1,742,080	1,685,884	1,742,080	20,511,591
monthly turnovers (N/month) with avg = total annual	154.79	139.81	154.79	149.80	154.79	149.80	154.79	154.79	149.80	154.79	149.80	154.79	1,822.51
vented vapor saturation factor (K_S)	0.8637	0.8444	0.8022	0.7490	0.6898	0.6420	0.6252	0.6306	0.6759	0.7540	0.8212	0.8591	0.7545
vent setting correction factor (K_B)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
vapor density (W_V lb/ft^3)	0.0006	0.0007	0.0009	0.0012	0.0016	0.0020	0.0021	0.0020	0.0017	0.0012	0.0008	0.0006	0.0012
standing storage losses (L_S lb/month & avg is lb/yr)	6.61	6.89	10.00	12.88	17.51	20.71	22.90	22.42	18.01	13.00	8.63	6.85	166.40
working losses (L_W lb/month & avg is lb/yr)	788.92	822.77	1193.94	1537.66	2089.81	2472.05	2733.94	2676.72	2149.74	1551.55	1030.35	818.01	19865.47
total losses (L_T lb/month & avg is lb/yr)	795.53	829.67	1203.94	1550.54	2107.31	2492.76	2756.84	2699.15	2167.75	1564.55	1038.98	824.86	20031.87
max hourly Q in bbl/hour	2341.51	2341.51	2341.51	2341.51	2341.51	2341.51	2341.51	2341.51	2341.51	2341.51	2341.51	2341.51	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	1.060	1.224	1.605	2.136	2.809	3.433	3.675	3.598	2.986	2.085	1.431	1.099	
breathing/standing loss (L_S lb/hr)	0.009	0.010	0.014	0.021	0.027	0.032	0.033	0.032	0.025	0.017	0.012	0.009	
max hourly total loss (L_T lb/hr)	1.069	1.235	1.619	2.156	2.836	3.466	3.708	3.629	3.011	2.103	1.443	1.109	

L_S sum months	L_W sum months	L_T sum months
166.40	19865.47	20031.87

The monthly sums will be greater than the annual average since the monthly variables yield higher emissions

Emissions Summary:	**avg lbs/hr**	**max lbs/hr**	**lbs/yr**
Standing/Breathing Loss L_S	**0.017**	**0.033**	**152.552**
Working Loss L_W	**2.079**	**3.675**	**18,211.969**
Total Loss L_T	**2.096**	**3.708**	**18,364.521**

max hourly total loss may not add up to L_S + L_W as their max values may be in different months

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Normalized Component Calculation

Skimmer Tank Oil Flash Analysis; Southern Petroleum Laboratories Report No.: 23080182-006A

COMPONENT	mole %	mole % w/extra component	COMPONENT MW	Fuel Weight	Normalized WT %	Component BTU/scf	Partial Heating Values
Water	0.0000	0.0000	18	0.00	0.0000	0	0
Nitrogen	1.1890	1.1890	28.0134	0.33	0.7591	0	0
Methane	3.1500	3.1499	16.043	0.51	1.1517	1010	32
Carbon Dioxide	81.5150	81.5137	44.01	35.87	81.7594	0	0
Ethane	3.7410	3.7409	30.07	1.12	2.5637	1770	66
Hydrogen Sulfide	0.0000	0.0000	34.08	0.00	0.0000	637	0
Propane	4.1340	4.1339	44.097	1.82	4.1546	2516	104
I-Butane	1.3090	1.3090	58.123	0.76	1.7339	3252	43
N-Butane	2.1710	2.1710	58.123	1.26	2.8758	3262	71
I-Pentane	1.0570	1.0570	72.15	0.76	1.7380	4001	42
N-Pentane	0.6630	0.6630	72.15	0.48	1.0902	4009	27
Other hexanes	0.4400	0.4400	86.177	0.38	0.8642	4750	21
N-hexane	0.2470	0.2470	86.177	0.21	0.4851	4756	12
Methylcyclopentane	0.0800	0.0800	84.1608	0.07	0.1534	4501	4
benzene	0.0240	0.0240	78.114	0.02	0.0427	3742	1
cyclohexane	0.0790	0.0790	84.1608	0.07	0.1515	4482	4
heptane	0.1200	0.1200	100.204	0.12	0.2740	5503	7
Methylcyclohexane	0.0290	0.0290	98.18	0.03	0.0649	5216	2
toluene	0.0060	0.0060	92.141	0.01	0.0126	4475	0
iso-octane	0.0200	0.0200	114.22	0.02	0.0521	6232	1
octanes	0.0110	0.0110	114.22	0.01	0.0286	7000	1
ethylbenzene	0.0000	0.0000	106.167	0.00	0.0000	5222	0
xylene	0.0020	0.0020	106.167	0.00	0.0048	5208	0
nonanes	0.0120	0.0120	128.25	0.02	0.0351	6997	1
Decanes Plus	0.0010	0.0010	142.28	0.00	0.0032	7743	0
Max Hydrogen Sulfide	0.0016	0.0016	34.08	0.00	0.0012	637	0
TOTALS	**100.0016**	**100.0000**	**MW=**	**43.88**	100.0000	**total btu/scf**	**436.411639**
				sg	**1.5130**		
				VOC wt%	**13.7649**		
				Toxic wt%	**0.597**		

Tank Emission Calculations Based on AP 42 Chapter 7 (June 2020, Section 7.1.3.1), Fixed Roof

Tank ID	**5a-07-WST-CV**
Tank Description	**5000 BBL Produced Water Tank-Common Vent (ABJ-129A)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**38.70**
Vertical Height/Horizontal Length (H_S ft)	**24.00**
Roof Height (H_R ft)	**1.21**
Max Liquid Height (H_{LX} ft)	**23.00**
Avg Liquid Height (H_L ft)	**11.50**
Breather Vent Pressure Setting (P_{BP} psig)	
Breather Vent Vacuum Setting (P_{BV} psig)	
actual tank pressure (P_I psig)	**0.0**
Shell Paint Solar Absorptance (S_A)	**0.64**
Roof Paint Solar Absorptance (R_A)	**0.64**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.4031**

Tank Shell Color/Shade	**Aluminum - Diffuse**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Aluminum - Diffuse**
Tank Roof Paint Condition	**average**
Roof Type	**vertical tank with cone roof**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**3,650,000.00**
Annual Turnovers, N	**757.40**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**27,054.51**
vapor space outage (H_{VO} ft)	**12.903**
vapor space volume (V_V ft^3)	**15,177.73**

Major City for Meterological Data	**Jackson, MS**
Site Elevation (ft)	**300**
Atmospheric Pressure (P_A psia)	**14.537**
Table 7.1-2 Liquid	
*RVP**	
*API gravity**	
*°F basis for gv**	
bubble point psia	
API gravity at 60F	
API gravity at 100F	
Working Loss Product Factor (K_P)	**0.75**
working loss turnover factor K_N	**0.206**

*sales oil data determines RVP per API pub 4683

Tank contents (if not selected from Table 7.1-2):

Antoine constants (log_{10}, mmHg, °C)

component	*mole%*	*MW*	*lb/mole*	*wt%*	*A*	*B*	*C*
Water	100.000	18.015	18.01500	100.00000	8.108	1750.300	235.000
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
	100.000		18.015	100.000			

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	Jan	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Avg*
hourly average maximum ambient temperature (T_{AX} °F)	56.50	60.80	68.10	75.70	83.00	89.00	91.10	91.20	86.50	77.10	66.30	58.10	75.30
hourly average minimum ambient temperature (T_{AN} °F)	37.00	39.30	45.90	53.30	62.50	69.20	72.10	71.40	65.50	53.90	43.90	37.90	54.30
daily total solar insolation factor (I btu/ft^2 day)	783	1039	1369	1762	1929	2025	1969	1849	1576	1262	922	726	1434
daily average ambient temperature (T_{AA} °F)	46.75	50.05	57.00	64.50	72.75	79.10	81.60	81.30	76.00	65.50	55.10	48.00	64.80
liquid bulk temperature (T_B °F)	48.25	52.04	59.63	67.88	76.45	82.99	85.38	84.85	79.03	67.92	56.87	49.39	67.55
average vapor temperature (T_V °F)	51.58	56.46	65.44	75.37	84.65	91.59	93.75	92.71	85.72	73.28	60.79	52.48	73.65
daily ambient temperature range (ΔT_A °R)	19.50	21.50	22.20	22.40	20.50	19.80	19.00	19.80	21.00	23.20	22.40	20.20	21.00
daily vapor temperature range (ΔT_V °R)	23.67	28.35	33.06	38.23	39.04	39.78	38.50	37.53	34.87	32.39	27.48	23.52	33.06
daily average liquid surface temperature (T_{LA} °F)	49.92	54.25	62.54	71.63	80.55	87.29	89.56	88.78	82.37	70.60	58.83	50.94	70.60
daily maximum liquid surface temperature (T_{LX} °F)	55.83	61.34	70.80	81.18	90.31	97.23	99.19	98.16	91.09	78.70	65.70	56.82	78.86
daily minimum liquid surface temperature (T_{LN} °F)	44.00	47.16	54.27	62.07	70.79	77.34	79.94	79.40	73.66	62.51	51.96	45.06	62.34
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	0.177	0.208	0.280	0.384	0.516	0.641	0.689	0.672	0.548	0.371	0.246	0.184	0.371
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	0.221	0.269	0.373	0.527	0.705	0.874	0.927	0.898	0.723	0.486	0.313	0.229	0.489
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	0.142	0.160	0.208	0.276	0.373	0.465	0.506	0.497	0.411	0.280	0.191	0.148	0.278
daily vapor pressure range (ΔP_V)	0.0787	0.1088	0.1649	0.2515	0.3324	0.4088	0.4207	0.4012	0.3119	0.2061	0.1218	0.0809	0.2103
vapor space expansion factor (K_E)	0.0519	0.0628	0.0749	0.0897	0.0960	0.1021	0.1005	0.0974	0.0866	0.0756	0.0615	0.0517	0.0772
vapor molecular weight (M_V lb/lbmole)	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02
monthly hours with avg = total annual	744	672	744	720	744	720	744	744	720	744	720	744	8,760
throughputs (ft^3/month) and avg = total annual	1,740,340	1,571,920	1,740,340	1,684,200	1,740,340	1,684,200	1,740,340	1,740,340	1,684,200	1,740,340	1,684,200	1,740,340	20,491,100
monthly turnovers (N/month) with avg = total annual	64.33	58.10	64.33	62.25	64.33	62.25	64.33	64.33	62.25	64.33	62.25	64.33	757.40
vented vapor saturation factor (K_S)	0.8918	0.8754	0.8391	0.7921	0.7390	0.6951	0.6797	0.6850	0.7274	0.7978	0.8562	0.8881	0.7978
vent setting correction factor (K_B)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
vapor density (W_V lb/ft^3)	0.0006	0.0007	0.0009	0.0012	0.0016	0.0020	0.0021	0.0020	0.0017	0.0012	0.0008	0.0006	0.0012
standing storage losses (L_S lb/month & avg is lb/yr)	16.87	17.72	25.96	33.76	46.15	54.77	60.56	59.20	47.29	33.83	22.22	17.49	435.82
working losses (L_W lb/month & avg is lb/yr)	156.78	164.64	241.27	313.78	428.84	508.95	562.84	550.13	439.46	314.39	206.48	162.56	4050.13
total losses (L_T lb/month & avg is lb/yr)	173.66	182.36	267.24	347.54	474.98	563.71	623.40	609.33	486.75	348.23	228.70	180.06	4485.95
max hourly Q in bbl/hour	2339.17	2339.17	2339.17	2339.17	2339.17	2339.17	2339.17	2339.17	2339.17	2339.17	2339.17	2339.17	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	1.022	1.188	1.572	2.113	2.794	3.427	3.667	3.585	2.959	2.049	1.390	1.059	
breathing/standing loss (L_S lb/hr)	0.023	0.026	0.036	0.054	0.071	0.088	0.090	0.086	0.067	0.045	0.031	0.024	
max hourly total loss (L_T lb/hr)	1.044	1.214	1.608	2.167	2.866	3.515	3.758	3.671	3.026	2.094	1.421	1.083	

L_S sum months	L_W sum months	L_T sum months
435.82	4050.13	4485.95

The monthly sums will be greater than the annual average since the monthly variables yield higher emissions

Emissions Summary:	**avg lbs/hr**	**max lbs/hr**	**lbs/yr**
Standing/Breathing Loss L_S	**0.045**	**0.090**	**398.002**
Working Loss L_W	**0.422**	**3.667**	**3,698.685**
Total Loss L_T	**0.468**	**3.758**	**4,096.686**

max hourly total loss may not add up to L_S + L_W as their max values may be in different months

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Tank Emission Calculations Based on AP 42 Chapter 7 (June 2020, Section 7.1.3.1), Fixed Roof

Tank ID	**6-07-SEP-V**
Tank Description	**API Separator (ZZZ-128)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Horizontal**
Tank Diameter (D ft)	**14.27**
Vertical Height/Horizontal Length (H_S ft)	**40.00**
Roof Height (H_R ft)	
Max Liquid Height (H_{LX} ft)	**14.27**
Avg Liquid Height (H_L ft)	**7.14**
Breather Vent Pressure Setting (P_{BP} psig)	
Breather Vent Vacuum Setting (P_{BV} psig)	
actual tank pressure (P_I psig)	**0.0**
Shell Paint Solar Absorptance (S_A)	**0.71**
Roof Paint Solar Absorptance (R_A)	**0.71**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	

Tank Shell Color/Shade	**Gray - Medium**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Gray - Medium**
Tank Roof Paint Condition	**average**
Roof Type	**horizontal tank**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**7,300.00**
Annual Turnovers, N	**6.41**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**6,397.32**
vapor space outage (H_{VO} ft)	**5.604**
vapor space volume (V_V ft^3)	**3,198.66**

Major City for Meterological Data	**Jackson, MS**
Site Elevation (ft)	**300**
Atmospheric Pressure (P_A psia)	**14.537**
Table 7.1-2 Liquid	**crude oil**
*RVP**	**6.18**
*API gravity**	**40.5**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**40.5**
API gravity at 100F	**44.0**
Working Loss Product Factor (K_P)	**0.75**
working loss turnover factor K_N	**1.000**

*sales oil data determines RVP per API pub 4683

Tank contents (if not selected from Table 7.1-2):

component	*mole%*	*MW*	*lb/mole*	*wt%*	*Antoine constants (log_{10}, mmHg, °C) A*	*B*	*C*
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
	0.000		0.000	0.000			

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	Jan	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Avg*
hourly average maximum ambient temperature (T_{AX} °F)	56.50	60.80	68.10	75.70	83.00	89.00	91.10	91.20	86.50	77.10	66.30	58.10	75.30
hourly average minimum ambient temperature (T_{AN} °F)	37.00	39.30	45.90	53.30	62.50	69.20	72.10	71.40	65.50	53.90	43.90	37.90	54.30
daily total solar insolation factor (I btu/ft^2 day)	783	1039	1369	1762	1929	2025	1969	1849	1576	1262	922	726	1434
daily average ambient temperature (T_{AA} °F)	46.75	50.05	57.00	64.50	72.75	79.10	81.60	81.30	76.00	65.50	55.10	48.00	64.80
liquid bulk temperature (T_B °F)	48.42	52.26	59.92	68.25	76.86	83.41	85.79	85.24	79.36	68.19	57.06	49.55	67.85
average vapor temperature (T_V °F)	50.87	55.52	64.21	73.78	82.91	89.77	91.97	91.04	84.30	72.15	59.96	51.82	72.35
daily ambient temperature range (ΔT_A °R)	19.50	21.50	22.20	22.40	20.50	19.80	19.00	19.80	21.00	23.20	22.40	20.20	21.00
daily vapor temperature range (ΔT_V °R)	25.48	29.87	34.98	40.70	41.74	42.62	41.26	40.12	37.08	34.16	29.50	25.54	35.06
daily average liquid surface temperature (T_{LA} °F)	49.65	53.89	62.06	71.02	79.88	86.59	88.88	88.14	81.83	70.17	58.51	50.69	70.10
daily maximum liquid surface temperature (T_{LX} °F)	56.02	61.36	70.81	81.19	90.32	97.24	99.20	98.17	91.10	78.71	65.89	57.07	78.87
daily minimum liquid surface temperature (T_{LN} °F)	43.28	46.42	53.32	60.84	69.45	75.94	78.57	78.11	72.56	61.63	51.13	44.30	61.34
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	3.158	3.427	3.997	4.706	5.502	6.171	6.414	6.335	5.690	4.635	3.741	3.222	4.629
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	3.569	3.946	4.688	5.628	6.571	7.365	7.602	7.476	6.656	5.391	4.289	3.641	5.406
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	2.785	2.965	3.390	3.908	4.575	5.135	5.378	5.335	4.837	3.965	3.250	2.843	3.944
daily vapor pressure range (ΔP_V)	0.7837	0.9810	1.2987	1.7203	1.9954	2.2291	2.2241	2.1412	1.8190	1.4256	1.0386	0.7981	1.4621
vapor space expansion factor (K_E)	0.1189	0.1465	0.1903	0.2517	0.2982	0.3445	0.3490	0.3343	0.2741	0.2084	0.1531	0.1206	0.2138
vapor molecular weight (M_V lb/lbmole)	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
monthly hours with avg = total annual	744	672	744	720	744	720	744	744	720	744	720	744	8,760
throughputs (ft^3/month) and avg = total annual	3,481	3,144	3,481	3,368	3,481	3,368	3,481	3,481	3,368	3,481	3,368	3,481	40,982
monthly turnovers (N/month) with avg = total annual	0.54	0.49	0.54	0.53	0.54	0.53	0.54	0.54	0.53	0.54	0.53	0.54	6.41
vented vapor saturation factor (K_S)	0.5161	0.4956	0.4572	0.4171	0.3796	0.3530	0.3442	0.3470	0.3718	0.4208	0.4737	0.5110	0.4211
vent setting correction factor (K_B)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
vapor density (W_V lb/ft^3)	0.0288	0.0310	0.0356	0.0411	0.0472	0.0523	0.0542	0.0536	0.0487	0.0406	0.0335	0.0293	0.0405
standing storage losses (L_S lb/month & avg is lb/yr)	257.18	249.85	317.29	355.01	421.68	452.02	483.54	478.34	420.94	362.40	289.70	261.93	4349.89
working losses (L_W lb/month & avg is lb/yr)	75.23	73.08	92.81	103.84	123.34	132.22	141.44	139.92	123.13	106.00	84.74	76.62	1272.36
total losses (L_T lb/month & avg is lb/yr)	332.41	322.94	410.10	458.85	545.03	584.24	624.97	618.26	544.07	468.40	374.44	338.55	5622.26
max hourly Q in bbl/hour	4.68	4.68	4.68	4.68	4.68	4.68	4.68	4.68	4.68	4.68	4.68	4.68	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.101	0.109	0.125	0.144	0.166	0.184	0.190	0.188	0.171	0.142	0.118	0.103	
breathing/standing loss (L_S lb/hr)	0.346	0.372	0.426	0.575	0.713	0.848	0.868	0.829	0.662	0.487	0.402	0.352	
max hourly total loss (L_T lb/hr)	0.447	0.481	0.551	0.719	0.879	1.032	1.058	1.017	0.833	0.630	0.520	0.455	

L_S sum months	L_W sum months	L_T sum months
4349.89	1272.36	5622.26

The monthly sums will be greater than the annual average since the monthly variables yield higher emissions

Emissions Summary:	**avg lbs/hr**	**max lbs/hr**	**lbs/yr**
Standing/Breathing Loss L_S	**0.486**	**0.868**	**4,260.431**
Working Loss L_W	**0.142**	**0.190**	**1,246.194**
Total Loss L_T	**0.629**	**1.058**	**5,506.624**

max hourly total loss may not add up to L_S + L_W as their max values may be in different months

Tank Emission Calculations Based on AP 42 Chapter 7 (June 2020, Section 7.1.3.1), Fixed Roof

Tank ID	**7a-07-OST-CV**
Tank Description	**400 BBL API Oil Disposal Tank-Common Vent (ABJ-108)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**12.00**
Vertical Height/Horizontal Length (H_S ft)	**20.00**
Roof Height (H_R ft)	**0.38**
Max Liquid Height (H_{LX} ft)	**19.00**
Avg Liquid Height (H_L ft)	**9.50**
Breather Vent Pressure Setting (P_{BP} psig)	
Breather Vent Vacuum Setting (P_{BV} psig)	
actual tank pressure (P_I psig)	**0.0**
Shell Paint Solar Absorptance (S_A)	**0.64**
Roof Paint Solar Absorptance (R_A)	**0.64**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.1250**

Tank Shell Color/Shade	**Aluminum - Diffuse**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Aluminum - Diffuse**
Tank Roof Paint Condition	**average**
Roof Type	**vertical tank with cone roof**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**7,300.00**
Annual Turnovers, N	**19.07**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**2,148.85**
vapor space outage (H_{VO} ft)	**10.625**
vapor space volume (V_V ft^3)	**1,201.66**

Major City for Meterological Data	**Jackson, MS**
Site Elevation (ft)	**300**
Atmospheric Pressure (P_A psia)	**14.537**
Table 7.1-2 Liquid	**crude oil**
*RVP**	**6.18**
*API gravity**	**40.5**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**40.5**
API gravity at 100F	**44.0**
Working Loss Product Factor (K_P)	**0.75**
working loss turnover factor K_N	**1.000**

*sales oil data determines RVP per API pub 4683

Tank contents (if not selected from Table 7.1-2):

component	*mole%*	*MW*	*lb/mole*	*wt%*	*Antoine constants (log_{10}, mmHg, °C) A*	*B*	*C*
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
	0.000		0.000	0.000			

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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
hourly average maximum ambient temperature (T_{AX} °F)	56.50	60.80	68.10	75.70	83.00	89.00	91.10	91.20	86.50	77.10	66.30	58.10	75.30
hourly average minimum ambient temperature (T_{AN} °F)	37.00	39.30	45.90	53.30	62.50	69.20	72.10	71.40	65.50	53.90	43.90	37.90	54.30
daily total solar insolation factor (I btu/ft^2 day)	783	1039	1369	1762	1929	2025	1969	1849	1576	1262	922	726	1434
daily average ambient temperature (T_{AA} °F)	46.75	50.05	57.00	64.50	72.75	79.10	81.60	81.30	76.00	65.50	55.10	48.00	64.80
liquid bulk temperature (T_B °F)	48.25	52.04	59.63	67.88	76.45	82.99	85.38	84.85	79.03	67.92	56.87	49.39	67.55
average vapor temperature (T_V °F)	50.81	55.43	64.09	73.63	82.74	89.59	91.80	90.88	84.17	72.04	59.88	51.76	72.23
daily ambient temperature range (ΔT_A °R)	19.50	21.50	22.20	22.40	20.50	19.80	19.00	19.80	21.00	23.20	22.40	20.20	21.00
daily vapor temperature range (ΔT_V °R)	24.38	28.60	33.06	38.23	39.04	39.78	38.50	37.53	34.87	32.39	28.23	24.42	33.06
daily average liquid surface temperature (T_{LA} °F)	49.53	53.74	61.86	70.76	79.60	86.29	88.59	87.87	81.60	69.98	58.37	50.58	69.89
daily maximum liquid surface temperature (T_{LX} °F)	55.63	60.89	70.13	80.31	89.36	96.24	98.22	97.25	90.31	78.08	65.43	56.68	78.16
daily minimum liquid surface temperature (T_{LN} °F)	43.44	46.59	53.60	61.20	69.84	76.35	78.97	78.48	72.88	61.88	51.32	44.47	61.63
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	3.150	3.417	3.982	4.684	5.475	6.140	6.383	6.306	5.667	4.619	3.731	3.215	4.612
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	3.542	3.911	4.631	5.543	6.466	7.245	7.482	7.365	6.570	5.332	4.253	3.614	5.339
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	2.794	2.974	3.408	3.934	4.607	5.173	5.415	5.370	4.865	3.984	3.262	2.852	3.965
daily vapor pressure range (ΔP_V)	0.7483	0.9370	1.2237	1.6097	1.8585	2.0720	2.0670	1.9953	1.7050	1.3481	0.9916	0.7618	1.3739
vapor space expansion factor (K_E)	0.1136	0.1400	0.1793	0.2354	0.2775	0.3196	0.3237	0.3109	0.2567	0.1971	0.1463	0.1151	0.2009
vapor molecular weight (M_V lb/lbmole)	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
monthly hours with avg = total annual	744	672	744	720	744	720	744	744	720	744	720	744	8,760
throughputs (ft^3/month) and avg = total annual	3,481	3,144	3,481	3,368	3,481	3,368	3,481	3,481	3,368	3,481	3,368	3,481	40,982
monthly turnovers (N/month) with avg = total annual	1.62	1.46	1.62	1.57	1.62	1.57	1.62	1.62	1.57	1.62	1.57	1.62	19.07
vented vapor saturation factor (K_S)	0.3605	0.3420	0.3084	0.2749	0.2449	0.2243	0.2176	0.2197	0.2386	0.2777	0.3225	0.3558	0.2780
vent setting correction factor (K_B)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
vapor density (W_V lb/ft^3)	0.0288	0.0309	0.0354	0.0409	0.0470	0.0521	0.0539	0.0534	0.0486	0.0405	0.0335	0.0293	0.0404
standing storage losses (L_S lb/month & avg is lb/yr)	59.81	58.07	73.69	82.38	97.82	104.85	112.18	111.01	97.74	84.20	67.36	60.93	1010.03
working losses (L_W lb/month & avg is lb/yr)	75.07	72.88	92.48	103.39	122.77	131.59	140.79	139.32	122.66	105.67	84.54	76.47	1267.63
total losses (L_T lb/month & avg is lb/yr)	134.88	130.95	166.17	185.76	220.60	236.44	252.97	250.32	220.40	189.87	151.89	137.40	2277.66
max hourly Q in bbl/hour	4.68	4.68	4.68	4.68	4.68	4.68	4.68	4.68	4.68	4.68	4.68	4.68	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.101	0.108	0.124	0.144	0.165	0.183	0.189	0.187	0.170	0.142	0.117	0.103	
breathing/standing loss (L_S lb/hr)	0.080	0.086	0.099	0.133	0.160	0.187	0.190	0.183	0.149	0.113	0.094	0.082	
max hourly total loss (L_T lb/hr)	0.181	0.195	0.223	0.276	0.325	0.370	0.380	0.370	0.319	0.255	0.211	0.185	

L_S sum months	L_W sum months	L_T sum months
1010.03	1267.63	2277.66

The monthly sums will be greater than the annual average since the monthly variables yield higher emissions

Emissions Summary:

	avg lbs/hr	max lbs/hr	lbs/yr
Standing/Breathing Loss L_S	**0.113**	**0.190**	**989.409**
Working Loss L_W	**0.142**	**0.189**	**1,241.739**
Total Loss L_T	**0.255**	**0.380**	**2,231.148**

max hourly total loss may not add up to L_S + L_W as their max values may be in different months

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Tank Emission Calculations Based on AP 42 Chapter 7 (June 2020, Section 7.1.3.1), Fixed Roof

Tank ID	**7b-07-WST-CV**
Tank Description	**400 BBL API Water Disposal Tank-Common Vent (ABM-165A)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**12.00**
Vertical Height/Horizontal Length (H_S ft)	**20.00**
Roof Height (H_R ft)	**0.38**
Max Liquid Height (H_{LX} ft)	**19.00**
Avg Liquid Height (H_L ft)	**9.50**
Breather Vent Pressure Setting (P_{BP} psig)	
Breather Vent Vacuum Setting (P_{BV} psig)	
actual tank pressure (P_I psig)	**0.0**
Shell Paint Solar Absorptance (S_A)	**0.64**
Roof Paint Solar Absorptance (R_A)	**0.64**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.1250**

Tank Shell Color/Shade	**Aluminum - Diffuse**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Aluminum - Diffuse**
Tank Roof Paint Condition	**average**
Roof Type	**vertical tank with cone roof**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**146,000.00**
Annual Turnovers, N	**381.43**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**2,148.85**
vapor space outage (H_{VO} ft)	**10.625**
vapor space volume (V_V ft^3)	**1,201.66**

Major City for Meterological Data	**Jackson, MS**
Site Elevation (ft)	**300**
Atmospheric Pressure (P_A psia)	**14.537**
Table 7.1-2 Liquid	
*RVP**	
*API gravity**	
*°F basis for gv**	
bubble point psia	
API gravity at 60F	
API gravity at 100F	
Working Loss Product Factor (K_P)	**0.75**
working loss turnover factor K_N	**0.245**

*sales oil data determines RVP per API pub 4683

Tank contents (if not selected from Table 7.1-2):

component	*mole%*	*MW*	*lb/mole*	*wt%*	*Antoine constants (log_{10}, mmHg, °C) A*	*B*	*C*
Water	100.000	18.015	18.01500	100.00000	8.108	1750.300	235.000
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
	100.000		18.015	100.000			

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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
hourly average maximum ambient temperature (T_{AX} °F)	56.50	60.80	68.10	75.70	83.00	89.00	91.10	91.20	86.50	77.10	66.30	58.10	75.30
hourly average minimum ambient temperature (T_{AN} °F)	37.00	39.30	45.90	53.30	62.50	69.20	72.10	71.40	65.50	53.90	43.90	37.90	54.30
daily total solar insolation factor (I btu/ft^2 day)	783	1039	1369	1762	1929	2025	1969	1849	1576	1262	922	726	1434
daily average ambient temperature (T_{AA} °F)	46.75	50.05	57.00	64.50	72.75	79.10	81.60	81.30	76.00	65.50	55.10	48.00	64.80
liquid bulk temperature (T_B °F)	48.25	52.04	59.63	67.88	76.45	82.99	85.38	84.85	79.03	67.92	56.87	49.39	67.55
average vapor temperature (T_V °F)	50.81	55.43	64.09	73.63	82.74	89.59	91.80	90.88	84.17	72.04	59.88	51.76	72.23
daily ambient temperature range (ΔT_A °R)	19.50	21.50	22.20	22.40	20.50	19.80	19.00	19.80	21.00	23.20	22.40	20.20	21.00
daily vapor temperature range (ΔT_V °R)	24.38	28.60	33.06	38.23	39.04	39.78	38.50	37.53	34.87	32.39	28.23	24.42	33.06
daily average liquid surface temperature (T_{LA} °F)	49.53	53.74	61.86	70.76	79.60	86.29	88.59	87.87	81.60	69.98	58.37	50.58	69.89
daily maximum liquid surface temperature (T_{LX} °F)	55.63	60.89	70.13	80.31	89.36	96.24	98.22	97.25	90.31	78.08	65.43	56.68	78.16
daily minimum liquid surface temperature (T_{LN} °F)	43.44	46.59	53.60	61.20	69.84	76.35	78.97	78.48	72.88	61.88	51.32	44.47	61.63
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	0.175	0.204	0.274	0.373	0.501	0.621	0.668	0.653	0.534	0.363	0.242	0.182	0.362
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	0.219	0.264	0.365	0.512	0.685	0.847	0.900	0.874	0.706	0.476	0.310	0.227	0.477
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	0.139	0.156	0.203	0.267	0.361	0.450	0.490	0.483	0.400	0.274	0.187	0.144	0.271
daily vapor pressure range (ΔP_V)	0.0801	0.1080	0.1615	0.2451	0.3236	0.3977	0.4098	0.3913	0.3052	0.2023	0.1234	0.0830	0.2060
vapor space expansion factor (K_E)	0.0535	0.0632	0.0747	0.0894	0.0954	0.1014	0.0998	0.0967	0.0862	0.0754	0.0631	0.0536	0.0769
vapor molecular weight (M_V lb/lbmole)	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02
monthly hours with avg = total annual	744	672	744	720	744	720	744	744	720	744	720	744	8,760
throughputs (ft^3/month) and avg = total annual	69,614	62,877	69,614	67,368	69,614	67,368	69,614	69,614	67,368	69,614	67,368	69,614	819,644
monthly turnovers (N/month) with avg = total annual	32.40	29.26	32.40	31.35	32.40	31.35	32.40	32.40	31.35	32.40	31.35	32.40	381.43
vented vapor saturation factor (K_S)	0.9104	0.8968	0.8665	0.8266	0.7801	0.7408	0.7265	0.7311	0.7687	0.8303	0.8802	0.9072	0.8307
vent setting correction factor (K_B)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
vapor density (W_V lb/ft^3)	0.0006	0.0007	0.0009	0.0012	0.0015	0.0019	0.0020	0.0020	0.0016	0.0011	0.0008	0.0006	0.0011
standing storage losses (L_S lb/month & avg is lb/yr)	1.37	1.43	2.09	2.70	3.69	4.38	4.85	4.74	3.80	2.73	1.80	1.42	35.00
working losses (L_W lb/month & avg is lb/yr)	7.36	7.70	11.24	14.54	19.84	23.54	26.06	25.51	20.44	14.68	9.68	7.64	188.24
total losses (L_T lb/month & avg is lb/yr)	8.73	9.13	13.32	17.24	23.53	27.92	30.90	30.25	24.24	17.40	11.48	9.06	223.23
max hourly Q in bbl/hour	93.57	93.57	93.57	93.57	93.57	93.57	93.57	93.57	93.57	93.57	93.57	93.57	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.040	0.047	0.062	0.082	0.109	0.133	0.143	0.140	0.116	0.080	0.055	0.042	
breathing/standing loss (L_S lb/hr)	0.002	0.002	0.003	0.004	0.006	0.007	0.007	0.007	0.005	0.004	0.002	0.002	
max hourly total loss (L_T lb/hr)	0.042	0.049	0.064	0.087	0.115	0.140	0.150	0.147	0.121	0.084	0.057	0.044	

L_S sum months	L_W sum months	L_T sum months
35.00	188.24	223.23

The monthly sums will be greater than the annual average since the monthly variables yield higher emissions

Emissions Summary:	**avg lbs/hr**	**max lbs/hr**	**lbs/yr**
Standing/Breathing Loss L_S	**0.004**	**0.007**	**32.018**
Working Loss L_W	**0.020**	**0.143**	**172.211**
Total Loss L_T	**0.023**	**0.150**	**204.229**

max hourly total loss may not add up to L_S + L_W as their max values may be in different months

Tank Emission Calculations Based on AP 42 Chapter 7 (June 2020, Section 7.1.3.1), Fixed Roof

Tank ID	**8-07-IOT-V & 9-07-IOT-V**
Tank Description	**1500 BBL Inhibitor Oil Blending Tank-Vent (BBJ-133A/B)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**21.50**
Vertical Height/Horizontal Length (H_S ft)	**24.00**
Roof Height (H_R ft)	**0.67**
Max Liquid Height (H_{LX} ft)	**23.00**
Avg Liquid Height (H_L ft)	**11.50**
Breather Vent Pressure Setting (P_{BP} psig)	
Breather Vent Vacuum Setting (P_{BV} psig)	
actual tank pressure (P_I psig)	**0.0**
Shell Paint Solar Absorptance (S_A)	**0.64**
Roof Paint Solar Absorptance (R_A)	**0.64**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.2240**

Tank Shell Color/Shade	**Aluminum - Diffuse**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Aluminum - Diffuse**
Tank Roof Paint Condition	**average**
Roof Type	**vertical tank with cone roof**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**45,625.00**
Annual Turnovers, N	**30.67**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**8,350.16**
vapor space outage (H_{VO} ft)	**12.724**
vapor space volume (V_V ft^3)	**4,619.44**

Major City for Meterological Data	**Jackson, MS**
Site Elevation (ft)	**300**
Atmospheric Pressure (P_A psia)	**14.537**
Table 7.1-2 Liquid	**crude oil**
*RVP**	**6.18**
*API gravity**	**40.5**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**40.5**
API gravity at 100F	**44.0**
Working Loss Product Factor (K_P)	**0.75**
working loss turnover factor K_N	**1.000**

*sales oil data determines RVP per API pub 4683

Tank contents (if not selected from Table 7.1-2):

component	*mole%*	*MW*	*lb/mole*	*wt%*	*Antoine constants (log_{10}, mmHg, °C) A*	*B*	*C*
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
	0.000		0.000	0.000			

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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
hourly average maximum ambient temperature (T_{AX} °F)	56.50	60.80	68.10	75.70	83.00	89.00	91.10	91.20	86.50	77.10	66.30	58.10	75.30
hourly average minimum ambient temperature (T_{AN} °F)	37.00	39.30	45.90	53.30	62.50	69.20	72.10	71.40	65.50	53.90	43.90	37.90	54.30
daily total solar insolation factor (I btu/ft^2 day)	783	1039	1369	1762	1929	2025	1969	1849	1576	1262	922	726	1434
daily average ambient temperature (T_{AA} °F)	46.75	50.05	57.00	64.50	72.75	79.10	81.60	81.30	76.00	65.50	55.10	48.00	64.80
liquid bulk temperature (T_B °F)	48.25	52.04	59.63	67.88	76.45	82.99	85.38	84.85	79.03	67.92	56.87	49.39	67.55
average vapor temperature (T_V °F)	51.11	55.84	64.63	74.31	83.50	90.38	92.57	91.60	84.78	72.53	60.24	52.04	72.79
daily ambient temperature range (ΔT_A °R)	19.50	21.50	22.20	22.40	20.50	19.80	19.00	19.80	21.00	23.20	22.40	20.20	21.00
daily vapor temperature range (ΔT_V °R)	24.09	28.39	33.06	38.23	39.04	39.78	38.50	37.53	34.87	32.39	27.91	24.07	33.06
daily average liquid surface temperature (T_{LA} °F)	49.68	53.94	62.13	71.10	79.97	86.68	88.97	88.22	81.90	70.23	58.55	50.72	70.17
daily maximum liquid surface temperature (T_{LX} °F)	55.70	61.04	70.39	80.66	89.73	96.63	98.60	97.61	90.62	78.32	65.53	56.74	78.43
daily minimum liquid surface temperature (T_{LN} °F)	43.66	46.84	53.86	61.54	70.21	76.74	79.35	78.84	73.18	62.13	51.58	44.70	61.91
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	3.160	3.430	4.002	4.713	5.511	6.181	6.424	6.344	5.697	4.640	3.744	3.224	4.635
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	3.548	3.922	4.654	5.576	6.507	7.291	7.529	7.408	6.604	5.355	4.261	3.618	5.365
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	2.807	2.989	3.425	3.959	4.639	5.208	5.451	5.403	4.892	4.002	3.278	2.865	3.986
daily vapor pressure range (ΔP_V)	0.7411	0.9330	1.2285	1.6175	1.8681	2.0828	2.0774	2.0048	1.7121	1.3528	0.9830	0.7524	1.3794
vapor space expansion factor (K_E)	0.1124	0.1393	0.1800	0.2367	0.2793	0.3221	0.3263	0.3132	0.2581	0.1978	0.1449	0.1137	0.2017
vapor molecular weight (M_V lb/lbmole)	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
monthly hours with avg = total annual	744	672	744	720	744	720	744	744	720	744	720	744	8,760
throughputs (ft^3/month) and avg = total annual	21,754	19,649	21,754	21,053	21,754	21,053	21,754	21,754	21,053	21,754	21,053	21,754	256,139
monthly turnovers (N/month) with avg = total annual	2.61	2.35	2.61	2.52	2.61	2.52	2.61	2.61	2.52	2.61	2.52	2.61	30.67
vented vapor saturation factor (K_S)	0.3194	0.3018	0.2704	0.2393	0.2120	0.1935	0.1875	0.1895	0.2065	0.2422	0.2837	0.3150	0.2424
vent setting correction factor (K_B)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
vapor density (W_V lb/ft^3)	0.0288	0.0310	0.0356	0.0411	0.0473	0.0524	0.0542	0.0536	0.0488	0.0406	0.0336	0.0294	0.0406
standing storage losses (L_S lb/month & avg is lb/yr)	201.79	196.05	248.99	278.61	330.94	354.74	379.47	375.38	330.32	284.37	227.31	205.51	3413.48
working losses (L_W lb/month & avg is lb/yr)	470.28	456.91	580.29	649.31	771.28	826.76	884.38	874.86	769.84	662.75	529.77	478.96	7955.40
total losses (L_T lb/month & avg is lb/yr)	672.07	652.96	829.28	927.92	1102.21	1181.50	1263.85	1250.24	1100.17	947.12	757.08	684.48	11368.88
max hourly Q in bbl/hour	29.24	29.24	29.24	29.24	29.24	29.24	29.24	29.24	29.24	29.24	29.24	29.24	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.632	0.680	0.780	0.902	1.037	1.148	1.189	1.176	1.069	0.891	0.736	0.644	
breathing/standing loss (L_S lb/hr)	0.271	0.292	0.335	0.448	0.539	0.628	0.638	0.612	0.500	0.382	0.316	0.276	
max hourly total loss (L_T lb/hr)	0.903	0.972	1.115	1.350	1.576	1.776	1.827	1.788	1.569	1.273	1.051	0.920	

L_S sum months	L_W sum months	L_T sum months
3413.48	7955.40	11368.88

The monthly sums will be greater than the annual average since the monthly variables yield higher emissions

Emissions Summary:	**avg lbs/hr**	**max lbs/hr**	**lbs/yr**
Standing/Breathing Loss L_S	**0.382**	**0.638**	**3,343.250**
Working Loss L_W	**0.889**	**1.189**	**7,791.733**
Total Loss L_T	**1.271**	**1.827**	**11,134.983**

max hourly total loss may not add up to L_S + L_W as their max values may be in different months

United States Environmental Protection Agency

Office of Pollution Prevention and Toxics
Washington, DC 20460

March 1999
EPA 745-R-99-005

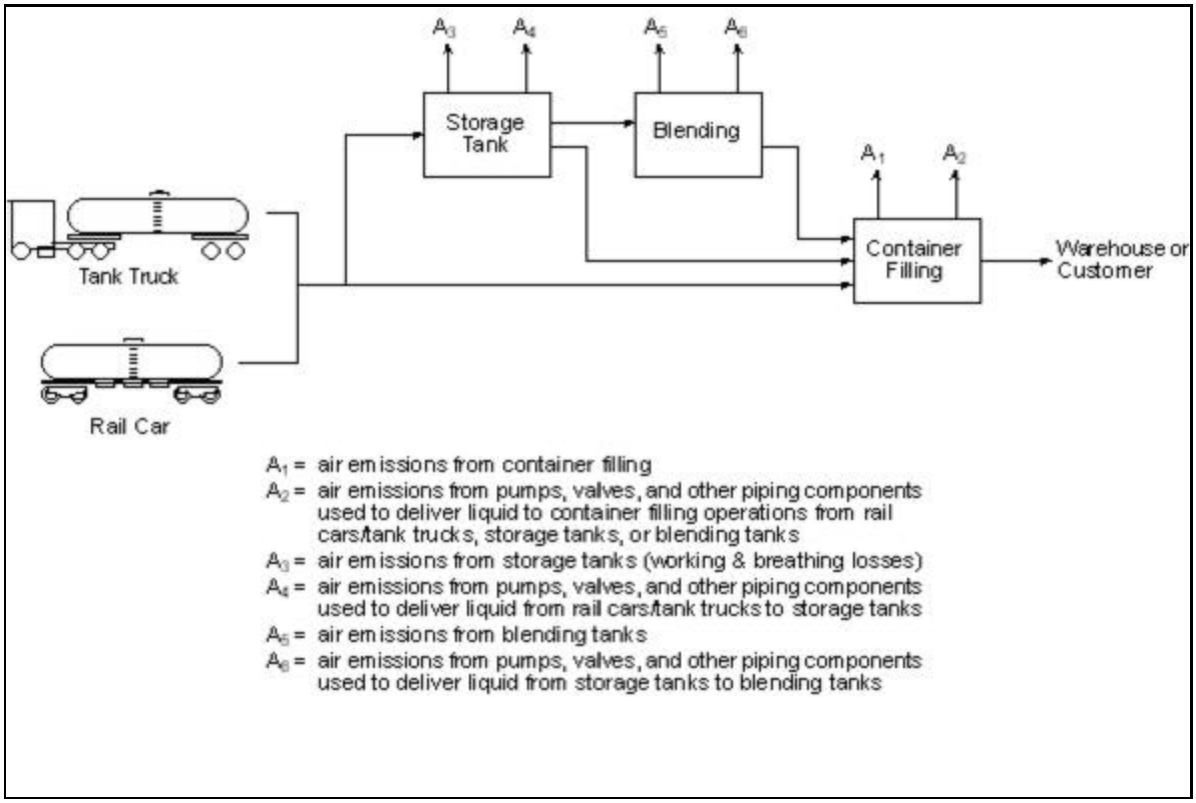
EPCRA Section 313

Look-up Tables for Estimating Toxic Release Inventory Air Emissions from Chemical Distribution Facilities

Section 313 of the Emergency Planning and Community Right-to-Know Act

Toxic Chemical Release Inventory

FIGURE 1: LIQUID BULK STORAGE AND CONTAINER FILLING PROCESS



n-Hexane Look-up Table

(CAS No. 110-54-3)

Air Emissions (in pounds) from bulk unloading, storage, blending and container filling operations at a typical chemical distribution facility in Louisville, KY

Type of Air Release (lb)	Throughput (1,000 lb/yr)									
	50	**100**	**250**	**500**	**750**	**1,000**	**2,000**	**3,000**	**5,000**	**10,000**
A1- Container filling emissions	34	68	170	340	510	679	1,359	2,038	3,397	6,794
A2 - Piping component leaks - delivery of liquid to container filling	1	1	3	6	8	11	22	33	56	112
A3 - Storage tank working + breathing losses (pick closest tank size) 5,000 gallon tank	265	299	400	569	737	905	1,017	1,129	1,354	1,916
10,000 gallon tank	429	463	564	732	901	1,069	1,743	1,862	2,087	2,649
25,000 gallon tank	892	926	1,027	1,195	1,364	1,532	2,206	2,880	4,200	4,762
A4 - Piping component leaks - delivery of liquid to storage tank	1	1	1	1	2	3	6	9	14	28
A5 - Blending/mixing tank emissions	34	67	169	337	506	674	1,348	1,467	1,692	2,253
A6 - Piping component leaks - delivery of liquid to blending/mixing tank	1	2	3	6	9	11	22	33	56	111

City	*State*	*City Factor*
Homer	AK	0.52
Birmingham	AL	1.21
Montgomery	AL	1.31
Little Rock	AR	1.21
Fort Smith	AR	1.18
Phoenix	AZ	1.67
Tucson	AZ	1.53
Bakersfield	CA	1.38
San Francisco	CA	1.02
Long Beach	CA	1.29
Los Angeles	CA	1.2
Sacramento	CA	1.21
Santa Maria	CA	1.07
Denver	CO	0.91
Grand Junction	CO	0.97
Wilmington	DE	0.93
Miami	FL	1.69
Atlanta	GA	1.17
Savannah	GA	1.34
Honolulu	HI	1.79
Des Moine	IA	0.83
Boise	ID	0.9
Chicago	IL	0.81
Springfield	IL	0.91
Indianapolis	IN	0.88
Wichita	KS	1.04
Louisville	KY	1
Baton Rouge	LA	1.4
Lake Charles	LA	1.41
New Orleans	LA	1.42
Boston	MA	0.84
Baltimore	MD	0.97
Portland	ME	0.71
Detroit	MI	0.79
Grand Rapids	MI	0.77
St. Paul	MN	0.71
St. Louis	MO	0.99
Jackson	MS	1.31
Billings	MT	0.77

Weighted Average for Inhibitor Oil Blending Tanks (EPNs: 8-07-IOT-V & 9-07-IOT-V) Thief Hatch Emissions

Working & Standing Losses from 1-IOT: **1.44** **lb/hr**
Blanket Gas Vapors from 1-IOT: **3.16** **lb/hr**

	10.66	**SCFH**	**29.19**	**SCFH**	**Weighted Avg.**					
Compound	**Vol % Total Working & Standing Losses**	**SCFH Total Working & Standing Losses**	**Vol % Total Blanket Gas Vapors**	**SCFH Total Blanket Gas Vapors**	**Total Vol %**	**MW**	**Wt of Gas**	**Wt %**	**dH**	**Heating Value**
Nitrogen	0.0000	0.0000	0.1755	0.0512	0.1286	28.020	0.036	**0.0822**	0	0.00
Hydrogen Sulfide	0.0016	0.0002	0.0016	0.0005	0.0016	34.080	0.001	**0.0012**	637	0.01
CO2	0.0000	0.0000	86.2426	25.1701	63.1733	44.010	27.803	**63.4401**	0	0.00
Meth	19.8192	2.1123	10.6094	3.0964	13.0730	16.043	2.097	**4.7856**	1010	132.04
Eth	9.5503	1.0178	1.4552	0.4247	3.6206	30.070	1.089	**2.4842**	1770	64.07
Propane	20.4697	2.1816	0.5805	0.1694	5.9007	44.097	2.602	**5.9373**	2516	148.47
Iso-B	1.3240	0.1411	0.1466	0.0428	0.4615	58.123	0.268	**0.6121**	3252	15.01
N-But	23.9126	2.5485	0.2383	0.0695	6.5710	58.123	3.819	**8.7148**	3262	214.37
Iso-Pent	1.0660	0.1136	0.1321	0.0386	0.3819	72.150	0.276	**0.6287**	4001	15.28
N-Pent	10.3778	1.1060	0.0896	0.0261	2.8416	72.150	2.050	**4.6782**	4009	113.92
methylcyclopent	0.0000	0.0000	0.0000	0.0000	0.0000	70.134	0.000	**0.0000**	3764	0.00
Other/Iso Hex	0.0000	0.0000	0.0807	0.0236	0.0591	86.177	0.051	**0.1162**	4750	2.81
N-Hex	4.7019	0.5011	0.0389	0.0114	1.2862	86.177	1.108	**2.5292**	4756	61.17
Benz	0.0660	0.0070	0.0208	0.0061	0.0329	78.114	0.026	**0.0586**	3742	1.23
CycloHex	0.0000	0.0000	0.0274	0.0080	0.0201	84.161	0.017	**0.0385**	4482	0.90
Hept	4.7089	0.5019	0.0635	0.0185	1.3061	100.204	1.309	**2.9864**	5503	71.87
Methylcyclohex	0.0000	0.0000	0.0279	0.0081	0.0204	98.188	0.020	**0.0458**	5216	1.07
Tol	0.0000	0.0000	0.0076	0.0022	0.0056	92.141	0.005	**0.0117**	4475	0.25
2,2,4-Tri	0.0000	0.0000	0.0000	0.0000	0.0000	114.231	0.000	**0.0000**	6232	0.00
EB	0.0000	0.0000	0.0005	0.0001	0.0004	106.167	0.000	**0.0009**	5222	0.02
Xyle	0.0000	0.0000	0.0044	0.0013	0.0032	106.167	0.003	**0.0078**	5209	0.17
octanes	3.0980	0.3302	0.0290	0.0085	0.8499	114.231	0.971	**2.2154**	6249	53.11
nonanes	0.0000	0.0000	0.0207	0.0060	0.0152	128.258	0.019	**0.0444**	6997	1.06
decanes	0.0000	0.0000	0.0072	0.0021	0.0053	142.285	0.008	**0.0171**	7743	0.41
other NM/NE HC	0.9040	0.0963	0.0000	0.0000	0.2418	102.090	0.247	**0.5633**	5200	12.57
Totals	100.0000	10.66	100.0000	29.19	100.0000		43.825	**100.0000**		**909.79**
		Total Stream Flowrate:	**39.84**	**SCFH**		**SG**	**1.5112**			

Specific Gravity of Tank Vapor Stream 1.7685
Heating Value of Tank Vapor Stream 2915.11

Atm. Control Flare

Williston Laboratory
3111 1st Ave W
Williston, ND 58801

Certificate of Analysis

Number: 172-23080182-002A

Aug. 22, 2023

Kevin Hendricks
Denbury
202 S 4th Street West
Baker, MT 59313

Station Name: MS Cranfield EOR Facility
Sample Point: Flare-ZZZ-191
Method: GPA 2286
Analyzed: 08/17/2023 16:14:14

Sampled By: John Fielder
Sample Of: Gas Spot
Sample Date: 08/04/2023 13:30
Sample Conditions: 0 psig, @ 97 °F
PO/Ref. No: 4300204782

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.696 psia
Nitrogen	4.7750	2.9696	
Methane	1.4267	0.5081	
Carbon Dioxide	69.4436	67.8490	
Ethane	4.7358	3.1614	1.2744
Propane	6.9504	6.8041	1.9267
Iso-Butane	2.6742	3.4506	0.8805
n-Butane	4.5182	5.8300	1.4332
Iso-Pentane	2.3750	3.8041	0.8740
n-Pentane	1.4043	2.2493	0.5122
Hexanes	0.9171	1.7545	0.3792
n-Hexane	0.2957	0.5657	0.1224
Benzene	0.0431	0.0747	0.0121
Cyclohexane	0.0972	0.1816	0.0333
Heptanes	0.2365	0.5261	0.1098
Methylcyclohexane	0.0297	0.0647	0.0120
Toluene	0.0018	0.0037	0.0006
Octanes	0.0449	0.1139	0.0231
Ethylbenzene	0.0007	0.0016	0.0003
Xylenes	0.0015	0.0035	0.0006
Nonanes	0.0211	0.0601	0.0119
Decanes Plus	0.0075	0.0237	0.0046
	100.0000	100.0000	7.6109

GPM TOTAL C2+ 7.612

Calculated Physical Properties	Total	C10+
Calculated Molecular Weight	45.04	142.28
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.696 psia & 60°F		
Higher Heating Value, Real Gas Dry BTU	748.5	7742.9
Water Sat. Gas Base BTU	735.9	7607.8
Relative Density Real Gas	1.5683	4.9126
Compressibility Factor	0.9913	

Data reviewed by: Ahsenur Kara, Lab Technician 1

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

Normalized Component Calculation

Atm. Control Flare (ZZZ-191) - Flare Gas Analysis; Southern Petroleum Laboratories Report No.: 172-23080182-002A

COMPONENT	mole %	mole % w/extra component	COMPONENT MW	Fuel Weight	Normalized WT %	Component BTU/scf	Partial Heating Values
Water	0.0000	0.0000	18	0.00	0.0000	0	0
Nitrogen	4.7750	4.7748	28.0134	1.34	2.9695	0	0
Methane	1.4267	1.4266	16.043	0.23	0.5081	1010	14
Carbon Dioxide	69.4436	69.4401	44.01	30.56	67.8460	0	0
Ethane	4.7358	4.7356	30.07	1.42	3.1613	1770	84
Hydrogen Sulfide	0.0000	0.0000	34.08	0.00	0.0000	637	0
Propane	6.9504	6.9501	44.097	3.06	6.8039	2516	175
I-Butane	2.6742	2.6741	58.123	1.55	3.4505	3252	87
N-Butane	4.5182	4.5180	58.123	2.63	5.8298	3262	147
I-Pentane	2.3750	2.3749	72.15	1.71	3.8040	4001	95
N-Pentane	1.4043	1.4042	72.15	1.01	2.2492	4009	56
Other hexanes	0.9171	0.9171	86.177	0.79	1.7545	4750	44
N-hexane	0.2957	0.2957	86.177	0.25	0.5657	4756	14
Methylcyclopentane	0.0000	0.0000	84.1608	0.00	0.0000	4501	0
benzene	0.0431	0.0431	78.114	0.03	0.0747	3742	2
cyclohexane	0.0972	0.0972	84.1608	0.08	0.1816	4482	4
heptane	0.2365	0.2365	100.204	0.24	0.5261	5503	13
Methylcyclohexane	0.0297	0.0297	98.18	0.03	0.0647	5216	2
toluene	0.0018	0.0018	92.141	0.00	0.0037	4475	0
iso-octane	0.0000	0.0000	114.22	0.00	0.0000	6232	0
octanes	0.0449	0.0449	114.22	0.05	0.1138	7000	3
ethylbenzene	0.0007	0.0007	106.167	0.00	0.0016	5222	0
xylene	0.0015	0.0015	106.167	0.00	0.0035	5208	0
nonanes	0.0211	0.0211	128.25	0.03	0.0601	6997	1
Decanes Plus	0.0075	0.0075	142.28	0.01	0.0237	7743	1
Max Hydrogen Sulfide	0.0050	0.0050	34.08	0.00	0.0038	637	0
TOTALS	**100.0050**	**100.0000**	**MW=**	**45.04**	100.0000	**total btu/scf**	**742.33**
				sg	**1.5532**		
				VOC wt%	**25.5113**		
				Toxic wt%	**0.649**		

June 1998
RG-109

Air Permit Technical Guidance for Chemical Sources:

Flares and Vapor Oxidizers

printed on recycled paper

New Source Review Permits Division

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

Flare Emission Factors

The usual flare destruction efficiencies and emission factors are provided in Table 4. The high-Btu waste streams referred to in the table have a heating value greater than 1,000 Btu/scf.

Flare Destruction Efficiencies

Claims for destruction efficiencies greater than those listed in Table 4 will be considered on a case-by-case basis. The applicant may make one of the three following demonstrations to justify the higher destruction efficiency: (1) general method, (2) 99.5 percent justification, or (3) flare stack sampling.

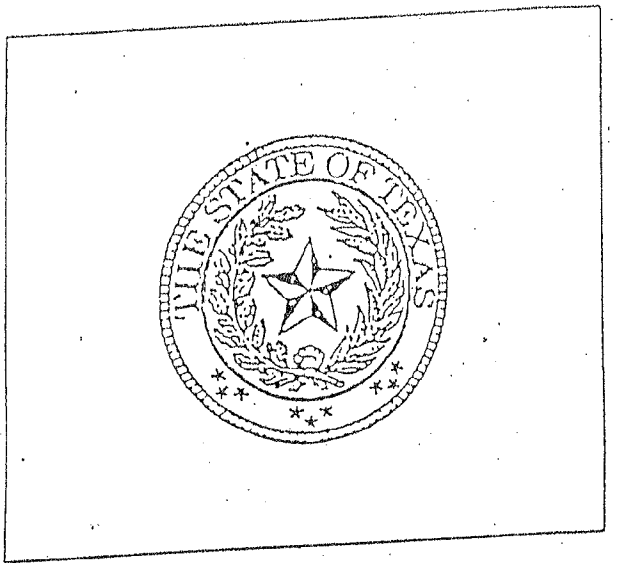
Table 4. Flare Factors

Waste Stream	Destruction/Removal Efficiency (DRE)		
VOC	98 percent (generic)		
	99 percent for compounds containing no more than 3 carbons that contain no elements other than carbon and hydrogen in addition to the following compounds: methanol, ethanol, propanol, ethylene oxide and propylene oxide		
H_2S	98 percent		
NH_3	case by case		
CO	case by case		
Air Contaminants	**Emission Factors**		
thermal NO_x	steam-assist:	high Btu	0.0485 lb/MMBtu
		low Btu	0.068 lb/MMBtu
	other:	high Btu	0.138 lb/MMBtu
		low Btu	0.0641 lb/MMBtu
fuel NO_x	NO_x is 0.5 wt percent of inlet NH_3, other fuels case by case		
CO	steam-assist:	high Btu	0.3503 lb/MMBtu
		low Btu	0.3465 lb/MMBtu
	other:	high Btu	0.2755 lb/MMBtu
		low Btu	0.5496 lb/MMBtu
PM	none, required to be smokeless		
SO_2	100 percent S in fuel to SO_2		

Technical Guidance Package for
Chemical Sources

Flare Sources

Texas Natural Resource Conservation Commission



John Hall, Chairman
Pam Reed, Commissioner
Peggy Garner, Commissioner
Dan Pearson, Executive Director

Compiled by TNRCC Chemical Section Engineers
November 1994

Published and distributed by the
Texas Natural Resource Conservation Commission
Post Office Box 13087
Austin, Texas 78711-3087
(512) 239-1250

greater than standard destruction efficiencies (>SDE) are claimed. The determinations shall indicate the maximum or minimum values required for flare performance at the claimed efficiency. The determinations shall be made during the testing protocols used to demonstrate >SDE.

A. Tip Velocities and Flow rates (maximum)

B. Heating Values (minimum).

4. The applicant shall install, calibrate, operate and maintain a flow meter to monitor actual stream flow rates to, and calculate tip velocities of, flares for which >SDE are claimed.

5. Records shall be maintained which indicate on a continuous basis the flow rates and heating values of the streams directed to the flares for which >SDE are claimed.

6. Flow rates of streams to flares for which >SDE are claimed shall not exceed the lesser of the indicated maxima; (1) flow rates which produce the tip velocities specified in 40 CFR 60.18, or (2) flow rates demonstrated during testing to correspond to the demonstrated flare efficiency.

7. Tip velocities of flares for which >SDE are claimed shall not exceed the lesser of the indicated maxima; (1) tip velocities specified in 40 CFR 60.18, or (2) tip velocities demonstrated during testing to correspond to the demonstrated flare efficiency.

8. Heating values of streams directed to flares for which >SDE are claimed shall be no less than the greater of the indicated minima; (1) 300 BTU/scf for streams directed to non-assisted flares and 400 BTU/scf for streams directed to assisted flares, or (2) heating values demonstrated during testing to correspond to the demonstrated flare efficiency.

9. The applicant shall provide vendor data supportive of the claimed flare efficiency.

NO_x and CO Emissions

The following NO_x and CO factors were derived by the Chemical Section of the New Source Review Division based on data published in the 1983 CMA document entitled, *A Report on A Flare Efficiency Study*. These factors should be used in estimating NO_x and CO emissions rather than the emission factors found in Section 11.5 of AP-42.

Table 3: Flare Factors.

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

Example 2:

For the sample case, calculate the mole percent of each constituent in the waste stream for both the average and maximum scenarios by dividing the individual flow rates by the total flow rates and multiplying by 100 percent.

Table 4: Calculation of constituents in mole percent.

	Average Case		Maximum Case	
	scfm	mole %	scfm	mole %
Butane+	10.16	5.08	12.70	5.08
Propylene	5.94	2.97	7.43	2.97
Propane	5.08	2.54	6.35	2.54
Ethylene	84.74	42.37	105.93	42.37
Ethane	37.28	18.64	46.60	18.64
Hydrogen	22.04	11.02	27.55	11.02
Ammonia	4.24	2.12	5.30	2.12
Inerts	30.50	15.26	38.13	15.26
Totals	200.00	100.00	250.00	100.00

In this case, our calculations are simplified since the average and maximum case waste streams have the same compositions. If they were of different composition, the following heating value calculations would be required for both cases. Note that the maximum case shows the maximum vent stream to the flare under normal operating conditions for the purpose of calculating emissions from the flare (upset and maintenance conditions are not considered).

Next, estimate the net, or lower, heating value of the waste stream

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

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

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

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

EMISSION FACTOR RATING: B

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

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

Table 13.5-2. HYDROCARBON COMPOSITION OF FLARE EMISSION[a]

Composition	Volume %	
	Average	Range
Methane	55	14 - 83
Ethane/Ethylene	8	1 - 14
Acetylene	5	0.3 - 23
Propane	7	0 - 16
Propylene	25	1 - 65

[a] Reference 1. The composition presented is an average of a number of test results obtained under the following sets of test conditions: steam-assisted flare using high-Btu-content feed; steam-assisted using low-Btu-content feed; air-assisted flare using high-Btu-content feed; and air-assisted flare using low-Btu-content feed. In all tests, "waste" gas was a synthetic gas consisting of a mixture of propylene and propane.

References For Section 13.5

1. *Flare Efficiency Study*, EPA-600/2-83-052, U. S. Environmental Protection Agency, Cincinnati, OH, July 1983.

2. K. D. Siegel, *Degree Of Conversion Of Flare Gas In Refinery High Flares*, Dissertation, University of Karlsruhe, Karlsruhe, Germany, February 1980.

3. *Manual On Disposal Of Refinery Wastes, Volume On Atmospheric Emissions*, API Publication 931, American Petroleum Institute, Washington, DC, June 1977.

LP Control Flare

SPL

Certificate of Analysis

Number: 2030-16080193-001A

Carencro Laboratory
4790 NE Evangeline Thruway
Carencro, LA 70520
Phone 337-896-3055

Aug. 26, 2016

Mark Garcia
Denbury Resources
5320 Legacy Drive
Plano, TX 75024

Field: Cranfield
Station Name: EOR Flare Inlet
Station Number:
Station Location:
Sample Point: ZZZ-190

Sampled By: BV-FSC
Sample Of: Gas Spot
Sample Date: 08/09/2016
Sample Conditions:
Method: GPA 2286
Analyzed: 08/18/2016 13:35:24 by CC7

Analytical Data

Components	Mol. %	Wt. %	GPM at 15.025 psia
Nitrogen	4.199	2.751	
Carbon Dioxide	90.057	92.686	
Methane	2.607	0.978	
Ethane	1.082	0.761	0.296
Propane	0.821	0.847	0.232
Iso-Butane	0.218	0.296	0.074
n-Butane	0.391	0.531	0.127
Iso-Pentane	0.208	0.351	0.078
n-Pentane	0.137	0.231	0.051
i-Hexanes	0.103	0.198	0.040
n-Hexane	0.042	0.087	0.018
Benzene	0.017	0.031	0.005
Cyclohexane	0.028	0.054	0.009
i-Heptanes	0.048	0.103	0.019
n-Heptane	0.011	0.025	0.005
Toluene	0.001	0.003	NIL
i-Octanes	0.028	0.060	0.011
n-Octane	0.001	0.003	0.001
Ethylbenzene	NIL	NIL	NIL
Xylenes	NIL	NIL	NIL
i-Nonanes	0.001	0.003	0.001
n-Nonane	NIL	NIL	NIL
Decane Plus	NIL	0.001	NIL
	100.000	100.000	0.967

GPM TOTAL C2+ 0.967

Calculated Physical Properties	Total	C10+
Calculated Molecular Weight	42.76	137.55
GPA 2172-09 Calculation:		
Calculated Gross BTU per ft³ @ 15.025 psia & 60°F		
Real Gas Dry BTU	116.1	7241.0
Water Sat. Gas Base BTU	114.1	7117.4
Relative Density Real Gas	1.4842	4.7594
Compressibility Factor	0.9944	

Comments: LELAP Certificate 05023

Hydrocarbon Laboratory Manager

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

Normalized Component Calculation

LP Control Flare (ZZZ-190) - Flare Gas Analysis; Southern Petroleum Laboratories Report No.: 2030-16080193-001A

COMPONENT	mole %	mole % w/extra component	COMPONENT MW	Fuel Weight	Normalized WT %	Component BTU/scf	Partial Heating Values
Water	0.0000	0.0000	18	0.00	0.0000	0	0
Nitrogen	4.1990	4.1989	28.0134	1.18	2.7499	0	0
Methane	2.6070	2.6069	16.043	0.42	0.9777	1010	26
Carbon Dioxide	90.0570	90.0543	44.01	39.63	92.6546	0	0
Ethane	1.0820	1.0820	30.07	0.33	0.7606	1770	19
Hydrogen Sulfide	0.0000	0.0000	34.08	0.00	0.0000	637	0
Propane	0.8210	0.8210	44.097	0.36	0.8464	2516	21
I-Butane	0.2180	0.2180	58.123	0.13	0.2962	3252	7
N-Butane	0.3910	0.3910	58.123	0.23	0.5313	3262	13
I-Pentane	0.2080	0.2080	72.15	0.15	0.3508	4001	8
N-Pentane	0.1370	0.1370	72.15	0.10	0.2311	4009	5
Other hexanes	0.1030	0.1030	86.177	0.09	0.2075	4750	5
N-hexane	0.0420	0.0420	86.177	0.04	0.0846	4756	2
Methylcyclopentane	0.0000	0.0000	84.1608	0.00	0.0000	4501	0
benzene	0.0170	0.0170	78.114	0.01	0.0310	3742	1
cyclohexane	0.0280	0.0280	84.1608	0.02	0.0551	4482	1
heptane	0.0590	0.0590	100.204	0.06	0.1382	5503	3
Methylcyclohexane	0.0000	0.0000	98.18	0.00	0.0000	5216	0
toluene	0.0010	0.0010	92.141	0.00	0.0022	4475	0
iso-octane	0.0280	0.0280	114.22	0.03	0.0748	6232	2
octanes	0.0010	0.0010	114.22	0.00	0.0027	7000	0
ethylbenzene	0.0000	0.0000	106.167	0.00	0.0000	5222	0
xylene	0.0000	0.0000	106.167	0.00	0.0000	5208	0
nonanes	0.0010	0.0010	128.25	0.00	0.0030	6997	0
Decanes Plus	0.0000	0.0000	142.28	0.00	0.0000	7743	0
Max Hydrogen Sulfide	0.0030	0.0030	34.08	0.00	0.0024	637	0
TOTALS	**100**	**100**	**MW=**	**42.77**	100.0000	**total btu/scf**	**113.77**
				sg	**1.4750**		
				VOC wt%	**2.8548**		
				Toxic wt%	**0.193**		

Tank Emission Calculations Based on AP 42 Chapter 7 (June 2020, Section 7.1.3.1), Fixed Roof

Tank ID	**13-07-CST**
Tank Description	**500 Gallon Chemical Storage Tank (BBJ-134A)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Horizontal**
Tank Diameter (D ft)	**4.00**
Vertical Height/Horizontal Length (H_S ft)	**5.00**
Roof Height (H_R ft)	
Max Liquid Height (H_{LX} ft)	**4.00**
Avg Liquid Height (H_L ft)	**2.00**
Breather Vent Pressure Setting (P_{BP} psig)	
Breather Vent Vacuum Setting (P_{BV} psig)	
actual tank pressure (P_I psig)	**0.0**
Shell Paint Solar Absorptance (S_A)	**0.90**
Roof Paint Solar Absorptance (R_A)	**0.9**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	

Tank Shell Color/Shade	**Red - Primer**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Red - Primer**
Tank Roof Paint Condition	**average**
Roof Type	**horizontal tank**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**35.71**
Annual Turnovers, N	**3.19**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**62.83**
vapor space outage (H_{VO} ft)	**1.571**
vapor space volume (V_V ft^3)	**31.42**

Major City for Meterological Data	**Jackson, MS**
Site Elevation (ft)	**300**
Atmospheric Pressure (P_A psia)	**14.537**
Table 7.1-2 Liquid	
*RVP**	
*API gravity**	
*°F basis for gv**	
bubble point psia	
API gravity at 60F	
API gravity at 100F	
Working Loss Product Factor (K_P)	**1**
working loss turnover factor K_N	**1.000**

*sales oil data determines RVP per API pub 4683

Tank contents (if not selected from Table 7.1-2):

Antoine constants (log_{10}, mmHg, °C)

component	*mole%*	*MW*	*lb/mole*	*wt%*	*A*	*B*	*C*
Hexane N-	100.000	86.180	86.18000	100.00000	6.878	1171.500	224.370
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
	100.000		86.180	100.000			

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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
hourly average maximum ambient temperature (T_{AX} °F)	56.50	60.80	68.10	75.70	83.00	89.00	91.10	91.20	86.50	77.10	66.30	58.10	75.30
hourly average minimum ambient temperature (T_{AN} °F)	37.00	39.30	45.90	53.30	62.50	69.20	72.10	71.40	65.50	53.90	43.90	37.90	54.30
daily total solar insolation factor (I btu/ft^2 day)	783	1039	1369	1762	1929	2025	1969	1849	1576	1262	922	726	1434
daily average ambient temperature (T_{AA} °F)	46.75	50.05	57.00	64.50	72.75	79.10	81.60	81.30	76.00	65.50	55.10	48.00	64.80
liquid bulk temperature (T_B °F)	48.86	52.86	60.70	69.26	77.96	84.57	86.92	86.29	80.26	68.91	57.59	49.96	68.67
average vapor temperature (T_V °F)	52.76	58.02	67.51	78.02	87.55	94.64	96.71	95.49	88.09	75.18	62.18	53.57	75.80
daily ambient temperature range (ΔT_A °R)	19.50	21.50	22.20	22.40	20.50	19.80	19.00	19.80	21.00	23.20	22.40	20.20	21.00
daily vapor temperature range (ΔT_V °R)	27.74	33.75	40.18	47.40	49.07	50.31	48.74	47.14	43.07	38.96	32.28	27.21	40.51
daily average liquid surface temperature (T_{LA} °F)	50.81	55.44	64.10	73.64	82.76	89.60	91.81	90.89	84.17	72.05	59.88	51.77	72.24
daily maximum liquid surface temperature (T_{LX} °F)	57.75	63.88	74.15	85.49	95.02	102.18	104.00	102.68	94.94	81.79	67.95	58.57	82.37
daily minimum liquid surface temperature (T_{LN} °F)	43.88	47.00	54.06	61.79	70.49	77.03	79.63	79.11	73.41	62.31	51.81	44.96	62.11
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	1.497	1.696	2.125	2.697	3.356	3.933	4.135	4.050	3.470	2.594	1.906	1.537	2.606
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	1.802	2.113	2.731	3.578	4.444	5.199	5.407	5.255	4.436	3.281	2.343	1.842	3.326
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	1.236	1.349	1.634	2.003	2.496	2.929	3.117	3.078	2.682	2.030	1.539	1.274	2.019
daily vapor pressure range (ΔP_V)	0.5663	0.7643	1.0968	1.5748	1.9478	2.2706	2.2897	2.1767	1.7534	1.2509	0.8043	0.5672	1.3064
vapor space expansion factor (K_E)	0.0978	0.1250	0.1651	0.2219	0.2647	0.3057	0.3085	0.2932	0.2376	0.1780	0.1258	0.0968	0.1857
vapor molecular weight (M_V lb/lbmole)	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18
monthly hours with avg = total annual	744	672	744	720	744	720	744	744	720	744	720	744	8,760
throughputs (ft^3/month) and avg = total annual	17	15	17	16	17	16	17	17	16	17	16	17	201
monthly turnovers (N/month) with avg = total annual	0.27	0.24	0.27	0.26	0.27	0.26	0.27	0.27	0.26	0.27	0.26	0.27	3.19
vented vapor saturation factor (K_S)	0.8892	0.8763	0.8497	0.8166	0.7816	0.7533	0.7439	0.7479	0.7759	0.8224	0.8630	0.8866	0.8217
vent setting correction factor (K_B)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
vapor density (W_V lb/ft^3)	0.0235	0.0263	0.0324	0.0403	0.0493	0.0570	0.0597	0.0586	0.0509	0.0389	0.0293	0.0240	0.0391
standing storage losses (L_S lb/month & avg is lb/yr)	3.49	3.53	4.81	5.79	7.32	8.19	8.87	8.70	7.31	5.79	4.22	3.57	71.60
working losses (L_W lb/month & avg is lb/yr)	0.40	0.40	0.55	0.66	0.84	0.94	1.02	1.00	0.84	0.66	0.48	0.41	8.21
total losses (L_T lb/month & avg is lb/yr)	3.89	3.93	5.36	6.46	8.16	9.13	9.88	9.70	8.15	6.45	4.70	3.98	79.80
max hourly Q in bbl/hour	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	
breathing/standing loss (L_S lb/hr)	0.005	0.005	0.006	0.010	0.013	0.017	0.018	0.017	0.012	0.008	0.006	0.005	
max hourly total loss (L_T lb/hr)	0.005	0.006	0.007	0.010	0.014	0.018	0.019	0.018	0.013	0.009	0.007	0.005	

L_S sum months	L_W sum months	L_T sum months
71.60	8.21	79.80

The monthly sums will be greater than the annual average since the monthly variables yield higher emissions

Emissions Summary:	**avg lbs/hr**	**max lbs/hr**	**lbs/yr**
Standing/Breathing Loss L_S	**0.008**	**0.018**	**68.382**
Working Loss L_W	**0.001**	**0.001**	**7.837**
Total Loss L_T	**0.009**	**0.019**	**76.219**

max hourly total loss may not add up to L_S + L_W as their max values may be in different months

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Tank Emission Calculations Based on AP 42 Chapter 7 (June 2020, Section 7.1.3.1), Fixed Roof

Tank ID	**14-07-CST**
Tank Description	**500 Gallon Chemical Storage Tank (BBJ-134B)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Horizontal**
Tank Diameter (D ft)	**4.00**
Vertical Height/Horizontal Length (H_S ft)	**5.00**
Roof Height (H_R ft)	
Max Liquid Height (H_{LX} ft)	**4.00**
Avg Liquid Height (H_L ft)	**2.00**
Breather Vent Pressure Setting (P_{BP} psig)	
Breather Vent Vacuum Setting (P_{BV} psig)	
actual tank pressure (P_I psig)	**0.0**
Shell Paint Solar Absorptance (S_A)	**0.90**
Roof Paint Solar Absorptance (R_A)	**0.9**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	

Tank Shell Color/Shade	**Red - Primer**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Red - Primer**
Tank Roof Paint Condition	**average**
Roof Type	**horizontal tank**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**47.62**
Annual Turnovers, N	**4.25**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**62.83**
vapor space outage (H_{VO} ft)	**1.571**
vapor space volume (V_V ft^3)	**31.42**

Major City for Meterological Data	**Jackson, MS**
Site Elevation (ft)	**300**
Atmospheric Pressure (P_A psia)	**14.537**
Table 7.1-2 Liquid	
*RVP**	
*API gravity**	
*°F basis for gv**	
bubble point psia	
API gravity at 60F	
API gravity at 100F	
Working Loss Product Factor (K_P)	**1**
working loss turnover factor K_N	**1.000**

*sales oil data determines RVP per API pub 4683

Tank contents (if not selected from Table 7.1-2):

Antoine constants (log_{10}, mmHg, °C)

component	*mole%*	*MW*	*lb/mole*	*wt%*	*A*	*B*	*C*
Hexane N-	100.000	86.180	86.18000	100.00000	6.878	1171.500	224.370
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
	100.000		86.180	100.000			

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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
hourly average maximum ambient temperature (T_{AX} °F)	56.50	60.80	68.10	75.70	83.00	89.00	91.10	91.20	86.50	77.10	66.30	58.10	75.30
hourly average minimum ambient temperature (T_{AN} °F)	37.00	39.30	45.90	53.30	62.50	69.20	72.10	71.40	65.50	53.90	43.90	37.90	54.30
daily total solar insolation factor (I btu/ft^2 day)	783	1039	1369	1762	1929	2025	1969	1849	1576	1262	922	726	1434
daily average ambient temperature (T_{AA} °F)	46.75	50.05	57.00	64.50	72.75	79.10	81.60	81.30	76.00	65.50	55.10	48.00	64.80
liquid bulk temperature (T_B °F)	48.86	52.86	60.70	69.26	77.96	84.57	86.92	86.29	80.26	68.91	57.59	49.96	68.67
average vapor temperature (T_V °F)	52.76	58.02	67.51	78.02	87.55	94.64	96.71	95.49	88.09	75.18	62.18	53.57	75.80
daily ambient temperature range (ΔT_A °R)	19.50	21.50	22.20	22.40	20.50	19.80	19.00	19.80	21.00	23.20	22.40	20.20	21.00
daily vapor temperature range (ΔT_V °R)	27.74	33.75	40.18	47.40	49.07	50.31	48.74	47.14	43.07	38.96	32.28	27.21	40.51
daily average liquid surface temperature (T_{LA} °F)	50.81	55.44	64.10	73.64	82.76	89.60	91.81	90.89	84.17	72.05	59.88	51.77	72.24
daily maximum liquid surface temperature (T_{LX} °F)	57.75	63.88	74.15	85.49	95.02	102.18	104.00	102.68	94.94	81.79	67.95	58.57	82.37
daily minimum liquid surface temperature (T_{LN} °F)	43.88	47.00	54.06	61.79	70.49	77.03	79.63	79.11	73.41	62.31	51.81	44.96	62.11
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	1.497	1.696	2.125	2.697	3.356	3.933	4.135	4.050	3.470	2.594	1.906	1.537	2.606
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	1.802	2.113	2.731	3.578	4.444	5.199	5.407	5.255	4.436	3.281	2.343	1.842	3.326
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	1.236	1.349	1.634	2.003	2.496	2.929	3.117	3.078	2.682	2.030	1.539	1.274	2.019
daily vapor pressure range (ΔP_V)	0.5663	0.7643	1.0968	1.5748	1.9478	2.2706	2.2897	2.1767	1.7534	1.2509	0.8043	0.5672	1.3064
vapor space expansion factor (K_E)	0.0978	0.1250	0.1651	0.2219	0.2647	0.3057	0.3085	0.2932	0.2376	0.1780	0.1258	0.0968	0.1857
vapor molecular weight (M_V lb/lbmole)	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18
monthly hours with avg = total annual	744	672	744	720	744	720	744	744	720	744	720	744	8,760
throughputs (ft^3/month) and avg = total annual	23	21	23	22	23	22	23	23	22	23	22	23	267
monthly turnovers (N/month) with avg = total annual	0.36	0.33	0.36	0.35	0.36	0.35	0.36	0.36	0.35	0.36	0.35	0.36	4.25
vented vapor saturation factor (K_S)	0.8892	0.8763	0.8497	0.8166	0.7816	0.7533	0.7439	0.7479	0.7759	0.8224	0.8630	0.8866	0.8217
vent setting correction factor (K_B)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
vapor density (W_V lb/ft^3)	0.0235	0.0263	0.0324	0.0403	0.0493	0.0570	0.0597	0.0586	0.0509	0.0389	0.0293	0.0240	0.0391
standing storage losses (L_S lb/month & avg is lb/yr)	3.49	3.53	4.81	5.79	7.32	8.19	8.87	8.70	7.31	5.79	4.22	3.57	71.60
working losses (L_W lb/month & avg is lb/yr)	0.53	0.54	0.74	0.89	1.12	1.25	1.36	1.33	1.12	0.88	0.64	0.55	10.94
total losses (L_T lb/month & avg is lb/yr)	4.02	4.07	5.55	6.68	8.44	9.44	10.22	10.03	8.43	6.67	4.86	4.12	82.54
max hourly Q in bbl/hour	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	
breathing/standing loss (L_S lb/hr)	0.005	0.005	0.006	0.010	0.013	0.017	0.018	0.017	0.012	0.008	0.006	0.005	
max hourly total loss (L_T lb/hr)	0.005	0.006	0.007	0.011	0.015	0.019	0.020	0.019	0.014	0.009	0.007	0.006	

L_S sum months	L_W sum months	L_T sum months
71.60	10.94	82.54

The monthly sums will be greater than the annual average since the monthly variables yield higher emissions

Emissions Summary:	**avg lbs/hr**	**max lbs/hr**	**lbs/yr**
Standing/Breathing Loss L_S	**0.008**	**0.018**	**68.382**
Working Loss L_W	**0.001**	**0.002**	**10.450**
Total Loss L_T	**0.009**	**0.020**	**78.831**

max hourly total loss may not add up to L_S + L_W as their max values may be in different months

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Tank Emission Calculations Based on AP 42 Chapter 7 (June 2020, Section 7.1.3.1), Fixed Roof

Tank ID	**15-07-CST**
Tank Description	**2000 Gallon Chemical Storage Tank (BBJ-134C)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Horizontal**
Tank Diameter (D ft)	**7.50**
Vertical Height/Horizontal Length (H_S ft)	**6.00**
Roof Height (H_R ft)	
Max Liquid Height (H_{LX} ft)	**7.50**
Avg Liquid Height (H_L ft)	**3.75**
Breather Vent Pressure Setting (P_{BP} psig)	
Breather Vent Vacuum Setting (P_{BV} psig)	
actual tank pressure (P_I psig)	**0.0**
Shell Paint Solar Absorptance (S_A)	**0.90**
Roof Paint Solar Absorptance (R_A)	**0.9**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	

Tank Shell Color/Shade	**Red - Primer**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Red - Primer**
Tank Roof Paint Condition	**average**
Roof Type	**horizontal tank**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**285.71**
Annual Turnovers, N	**6.05**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**265.07**
vapor space outage (H_{VO} ft)	**2.945**
vapor space volume (V_V ft^3)	**132.54**

Major City for Meterological Data	**Jackson, MS**
Site Elevation (ft)	**300**
Atmospheric Pressure (P_A psia)	**14.537**
Table 7.1-2 Liquid	
*RVP**	
*API gravity**	
*°F basis for gv**	
bubble point psia	
API gravity at 60F	
API gravity at 100F	
Working Loss Product Factor (K_P)	**1**
working loss turnover factor K_N	**1.000**

*sales oil data determines RVP per API pub 4683

Tank contents (if not selected from Table 7.1-2):

					Antoine constants (log_{10}, mmHg, °C)		
component	*mole%*	*MW*	*lb/mole*	*wt%*	*A*	*B*	*C*
Hexane N-	100.000	86.180	86.18000	100.00000	6.878	1171.500	224.370
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
	100.000		86.180	100.000			

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	Jan	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Avg*
hourly average maximum ambient temperature (T_{AX} °F)	56.50	60.80	68.10	75.70	83.00	89.00	91.10	91.20	86.50	77.10	66.30	58.10	75.30
hourly average minimum ambient temperature (T_{AN} °F)	37.00	39.30	45.90	53.30	62.50	69.20	72.10	71.40	65.50	53.90	43.90	37.90	54.30
daily total solar insolation factor (I btu/ft^2 day)	783	1039	1369	1762	1929	2025	1969	1849	1576	1262	922	726	1434
daily average ambient temperature (T_{AA} °F)	46.75	50.05	57.00	64.50	72.75	79.10	81.60	81.30	76.00	65.50	55.10	48.00	64.80
liquid bulk temperature (T_B °F)	48.86	52.86	60.70	69.26	77.96	84.57	86.92	86.29	80.26	68.91	57.59	49.96	68.67
average vapor temperature (T_V °F)	53.26	58.69	68.38	79.14	88.78	95.93	97.97	96.67	89.10	75.99	62.76	54.03	76.72
daily ambient temperature range (ΔT_A °R)	19.50	21.50	22.20	22.40	20.50	19.80	19.00	19.80	21.00	23.20	22.40	20.20	21.00
daily vapor temperature range (ΔT_V °R)	27.74	33.75	40.18	47.40	49.07	50.31	48.74	47.14	43.07	38.96	32.28	27.21	40.51
daily average liquid surface temperature (T_{LA} °F)	51.06	55.77	64.54	74.20	83.37	90.25	92.44	91.48	84.68	72.45	60.18	52.00	72.70
daily maximum liquid surface temperature (T_{LX} °F)	58.00	64.21	74.58	86.05	95.64	102.83	104.63	103.27	95.44	82.19	68.25	58.80	82.82
daily minimum liquid surface temperature (T_{LN} °F)	44.12	47.33	54.49	62.35	71.10	77.67	80.26	79.69	73.91	62.71	52.11	45.20	62.57
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	1.508	1.711	2.149	2.735	3.405	3.991	4.194	4.104	3.511	2.620	1.921	1.546	2.636
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	1.814	2.131	2.760	3.624	4.505	5.272	5.480	5.322	4.485	3.312	2.360	1.853	3.362
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	1.245	1.361	1.653	2.032	2.534	2.974	3.164	3.122	2.715	2.051	1.551	1.283	2.043
daily vapor pressure range (ΔP_V)	0.5694	0.7698	1.1069	1.5925	1.9707	2.2977	2.3160	2.2003	1.7701	1.2611	0.8093	0.5702	1.3184
vapor space expansion factor (K_E)	0.0980	0.1255	0.1660	0.2237	0.2674	0.3094	0.3122	0.2964	0.2397	0.1790	0.1262	0.0971	0.1869
vapor molecular weight (M_V lb/lbmole)	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18
monthly hours with avg = total annual	744	672	744	720	744	720	744	744	720	744	720	744	8,760
throughputs (ft^3/month) and avg = total annual	136	123	136	132	136	132	136	136	132	136	132	136	1,604
monthly turnovers (N/month) with avg = total annual	0.51	0.46	0.51	0.50	0.51	0.50	0.51	0.51	0.50	0.51	0.50	0.51	6.05
vented vapor saturation factor (K_S)	0.8095	0.7892	0.7488	0.7008	0.6529	0.6161	0.6044	0.6095	0.6460	0.7098	0.7693	0.8056	0.7085
vent setting correction factor (K_B)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
vapor density (W_V lb/ft^3)	0.0236	0.0265	0.0327	0.0408	0.0499	0.0577	0.0604	0.0592	0.0514	0.0393	0.0295	0.0242	0.0395
standing storage losses (L_S lb/month & avg is lb/yr)	12.84	13.02	17.78	21.46	27.12	30.37	32.86	32.23	27.05	21.37	15.54	13.15	264.79
working losses (L_W lb/month & avg is lb/yr)	3.22	3.26	4.45	5.37	6.79	7.61	8.23	8.07	6.77	5.35	3.89	3.29	66.31
total losses (L_T lb/month & avg is lb/yr)	16.06	16.28	22.23	26.83	33.92	37.98	41.09	40.30	33.82	26.72	19.44	16.44	331.10
max hourly Q in bbl/hour	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.004	0.005	0.006	0.007	0.009	0.011	0.011	0.011	0.009	0.007	0.005	0.004	
breathing/standing loss (L_S lb/hr)	0.017	0.019	0.024	0.035	0.048	0.061	0.063	0.059	0.044	0.029	0.022	0.018	
max hourly total loss (L_T lb/hr)	0.022	0.024	0.030	0.043	0.057	0.071	0.074	0.070	0.053	0.036	0.027	0.022	

L_S sum months	L_W sum months	L_T sum months
264.79	66.31	331.10

The monthly sums will be greater than the annual average since the monthly variables yield higher emissions

Emissions Summary:	**avg lbs/hr**	**max lbs/hr**	**lbs/yr**
Standing/Breathing Loss L_S	**0.029**	**0.063**	**252.767**
Working Loss L_W	**0.007**	**0.011**	**63.299**
Total Loss L_T	**0.036**	**0.074**	**316.065**

max hourly total loss may not add up to L_S + L_W as their max values may be in different months

HT-FG

H.L.P. Engineering, Inc.
Engr: Mr. Thomas LaSalle

LA Environmental Laboratory Accreditation
Cert. No. 01995
Denbury Onshore, LLC
Brookhaven Field Central Facility
Lincoln County, Mississippi

Multi-Stage Separator Test

Separator Conditions Pressure (psig)	Temperature (°F)	Liquid Density (g/cm^3)	Gas Density (g/cm^3)	Gas Gravity	Solution GOR, Rs (scf/stb)	Solution GOR, Rs (scf/sep bbl)	Liberated GOR, RI (scf/stb)	Separator Shrinkage (stb / bbl @ P,T)
200	**86**	**0.820**	**N/A**	**N/A**	**90**	**85**	0	**0.948**
39	120	0.826	0.0059	1.512	15	14	75	0.984
0	80	0.838	0.0020	1.635	0	0	15	1.000

Summary Data

Total Separator Gas-Oil Ratio	90	scf/stb
Stock Tank Oil Gravity	37.2	°API at 80 °F 35.7 @ 60°F
Separator Volume Factor	1.055	bbls@ Psat/stb
Color	Crude	

Notes:

- stb: stock tank barrel @ 80 °F.
- sep bbl: volume of separator liquid at P,T.
- Solution GOR is given as the gas volume per stock tank barrel (stb) and per separator barrel (sep bbl).
- Separator Volume Factor is the inverse of the Separator Shrinkage Factor.
- Standard Conditions: 0 psig at 80 °F.

HT-FG

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Lincoln County, Mississippi

Compositional Analysis of Multi-Stage Flash Gas

Sampled: 39 psig at 120 °F

Component	Mole %	GPM @ 15.025 psia	Wt %	Mole Wt.
Nitrogen	0.119	0.000	0.077	28.013
Carbon Dioxide	86.763	0.000	87.713	44.010
Methane	5.962	0.000	2.197	16.043
Ethane	1.197	0.326	0.826	30.070
Propane	1.715	0.482	1.737	44.097
Iso-Butane	0.416	0.139	0.556	58.123
N-Butane	1.025	0.330	1.369	58.123
Iso-Pentane	0.614	0.229	1.017	72.150
N-Pentane	0.538	0.199	0.892	72.150
Iso-Hexanes	0.387	0.164	0.765	86.177
N-Hexane	0.222	0.093	0.438	86.177
Methylcyclopentane	0.125	0.045	0.241	84.161
Benzene	0.069	0.020	0.124	78.114
Cyclohexane	0.098	0.034	0.190	84.161
Heptanes	0.270	0.127	0.621	100.204
Methylcyclohexane	0.147	0.060	0.332	98.188
Toluene	0.031	0.011	0.066	92.141
Iso-Octane	0.022	0.012	0.057	114.231
Octanes	0.148	0.077	0.389	114.231
Ethyl Benzene	0.005	0.002	0.013	106.167
Xylenes	0.026	0.011	0.064	106.167
Nonanes	0.067	0.039	0.198	128.258
Decane Plus	0.034	0.022	0.118	150.131
Totals	100.000	2.422	100.000	

VOCs 9,190/0
HAPs 0.762

Calculated Properties of Gas

Gas Specific Gravity	(Air = 1.00)		=	1.5121	
Net Heat of Combustion	(Btu/Cu.Ft. @ 15.025 Psia @ 60 °F)	Dry	=	286.6	Real
Gross Heat of Combustion	(Btu/Cu.Ft. @ 15.025 Psia @ 60 °F)	Dry	=	311.7	Real
Gross Heat of Combustion - Sat.	(Btu/Cu.Ft. @ 15.025 Psia @ 60 °F)	Wet	=	306.2	Water Sat.
Gas Compressibility	(@ 1 Atm. @ 60 °F)	Z	=	0.9937	

Normalized Component Calculation

Heater Treater-Flash Gas - Representative Oil Flash Gas Analysis; PENCOR Report No.: 31554-5006038374

COMPONENT	mole %	mole % w/extra component	COMPONENT MW	Fuel Weight	Normalized WT %	Component BTU/scf	Partial Heating Values
Water	0.0000	0.0000	18	0.00	0.0000	0	0
Nitrogen	0.1190	0.1190	28.0134	0.03	0.0766	0	0
Methane	5.9620	5.9618	16.043	0.96	2.1972	1010	60
Carbon Dioxide	86.7630	86.7604	44.01	38.18	87.7169	0	0
Ethane	1.1970	1.1970	30.07	0.36	0.8268	1770	21
Hydrogen Sulfide	0.0000	0.0000	34.08	0.00	0.0000	637	0
Propane	1.7150	1.7149	44.097	0.76	1.7373	2516	43
I-Butane	0.4160	0.4160	58.123	0.24	0.5554	3252	14
N-Butane	1.0250	1.0250	58.123	0.60	1.3686	3262	33
I-Pentane	0.6140	0.6140	72.15	0.44	1.0177	4001	25
N-Pentane	0.5380	0.5380	72.15	0.39	0.8917	4009	22
Other hexanes	0.3870	0.3870	86.177	0.33	0.7661	4750	18
N-hexane	0.2220	0.2220	86.177	0.19	0.4395	4756	11
Methylcyclopentane	0.1250	0.1250	84.1608	0.11	0.2417	4501	6
benzene	0.0690	0.0690	78.114	0.05	0.1238	3742	3
cyclohexane	0.0980	0.0980	84.1608	0.08	0.1895	4482	4
heptane	0.2700	0.2700	100.204	0.27	0.6215	5503	15
Methylcyclohexane	0.1470	0.1470	98.18	0.14	0.3315	5216	8
toluene	0.0310	0.0310	92.141	0.03	0.0656	4475	1
iso-octane	0.0220	0.0220	114.22	0.03	0.0577	6232	1
octanes	0.1480	0.1480	114.22	0.17	0.3883	7000	10
ethylbenzene	0.0050	0.0050	106.167	0.01	0.0122	5222	0
xylene	0.0260	0.0260	106.167	0.03	0.0634	5208	1
nonanes	0.0670	0.0670	128.25	0.09	0.1974	6997	5
Decanes Plus	0.0340	0.0340	142.28	0.05	0.1111	7743	3
Max Hydrogen Sulfide	0.0030	0.0030	34.08	0.00	0.0023	637	0
TOTALS	**100**	**100**	**MW=**	**43.53**	100.0000	**total btu/scf**	**303.78**
				sg	**1.5010**		
				VOC wt%	**9.1801**		
				Toxic wt%	**0.762**		

United States Environmental Protection Agency
Office of Air Quality Planning and Standards Research Triangle Park NC 27711
EPA-453/R-95-017 November 1995
Air

EPA

Protocol for Equipment Leak Emission Estimates

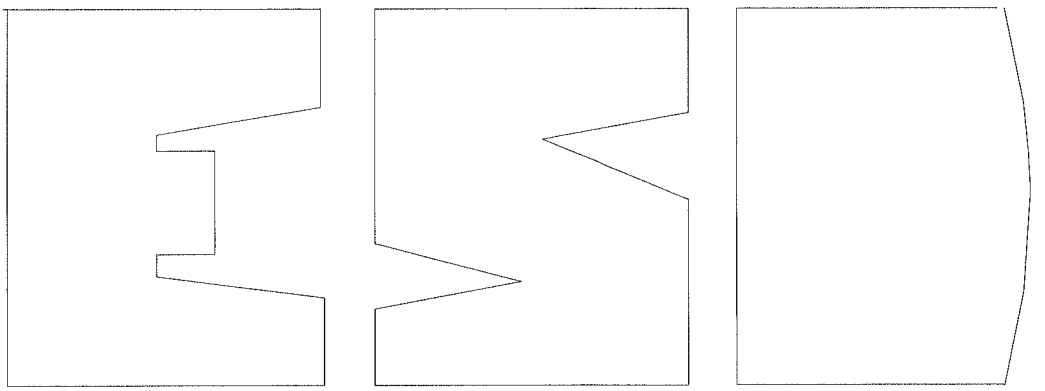

TABLE 2-4. OIL AND GAS PRODUCTION OPERATIONS AVERAGE EMISSION FACTORS (kg/hr/source)

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

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

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

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

EPA Average Emission Factors

The EPA emission factors used by GRI-HAPCalc 3.01 to estimate fugitive emissions were developed from data obtained during a joint American Petroleum Institute (API)/GRI fugitive testing program at natural gas production and processing sites [U.S. Environmental Protection Agency, 1995; American Petroleum Institute, 1995]. Over 184,000 components at 20 sites were screened for total hydrocarbon (THC) emissions, and the results were averaged for each component type to develop THC emission factors. Furthermore, a statistical analysis conducted by the EPA found no difference in THC fugitive emissions by industry segment for oil and gas production operation. The average THC emission factors for equipment in gas and light liquid service are shown in Table 20.

Table 20. EPA Average Emission Factors for THC

	Emission Factor, lb THC/yr		
Component	Gas Service	Light Liquids Service	Heavy Liquids Service
Connections	3.9	4.1	0.1
Flanges	7.5	2.1	0.0075
Open-Ended Line	39	27	2.7
Pump Seals	46	250	NA
Valves	87	48	0.16
Other*	170	140	0.62

** The "Other" category includes compressors, diaphragms, drains, dump arms, hatches, instruments, meters, pressure relief valves, polished rods, relief valves, and vents.*

To calculate speciated fugitive emissions for BTEX, methane, NMHC, and NMEHC, composition data obtained during a joint American Petroleum Institute (API)/GRI fugitive testing program are used with the THC emission factors above. The average compositions of fugitive leaks from production facilities and natural gas plants are shown in Table 21.

Table 21. Fractional Composition of Fugitive Emissions

	Fractional Composition, lb/lb THC			
Compound	Gas Production/ Compressor Station	Gas Plant	Light Liquid Service	Heavy Liquid Service
Benzene	0.00023	0.00123	0.00027	0.00935
Toluene	0.00039	0.00032	0.00075	0.00344
Ethylbenzene	0.000020	0.000010	0.000170	0.00051
Xylenes (m,p,o)	0.00010	0.000040	0.000360	0.00372
Methane	0.920	0.564	0.613	0.942
NMHC	0.080	0.436	0.387	0.058
NMEHC	0.0350	0.253	0.292	0.030

The following equation shows how annual emission rates are calculated from the above emission factors. The user-entered component count of each type of fugitive emission source is multiplied by the emission factor (lb THC/component/year) and the fractional composition (lb compound *i* / lb THC). This is then converted to an annual emission rate. Note that all calculations in GRI-HAPCalc 3.01 are done in U.S. Standard units and converted to metric units when necessary.

Normalized Component Calculation

Fugitive Emissions Speciation - Light Liquid Service

COMPONENT	mole %	mole % w/extra component	COMPONENT MW	fuel weight	Normalized WT %	component BTU/scf	partial Heating values
Water	0.0000	0.0000	18	0.00	0.0000	0	0
Nitrogen	0.0000	0.0000	28.0134	0.00	0.0000	0	0
Methane	86.3900	86.3886	16.043	13.86	61.3028	1010	873
Carbon Dioxide	0.0000	0.0000	44.01	0.00	0.0000	0	0
Ethane	7.1400	7.1399	30.07	2.15	9.4965	1770	126
Hydrogen Sulfide	0.0000	0.0000	34.08	0.00	0.0000	637	0
Propane	0.0000	0.0000	44.097	0.00	0.0000	2516	0
I-Butane	0.0000	0.0000	58.123	0.00	0.0000	3252	0
N-Butane	0.0000	0.0000	58.123	0.00	0.0000	3262	0
I-Pentane	0.0000	0.0000	72.15	0.00	0.0000	4001	0
N-Pentane	0.0000	0.0000	72.15	0.00	0.0000	4009	0
Other hexanes	0.0000	0.0000	86.177	0.00	0.0000	4750	0
N-hexane	0.0000	0.0000	86.177	0.00	0.0000	4756	0
Methylcyclopentane	0.0000	0.0000	84.1608	0.00	0.0000	4501	0
benzene	0.0100	0.0100	78.114	0.01	0.0346	3742	0
cyclohexane	0.0000	0.0000	84.1608	0.00	0.0000	4482	0
heptane	0.0000	0.0000	100.204	0.00	0.0000	5503	0
Methylcyclohexane	0.0000	0.0000	98.18	0.00	0.0000	5216	0
toluene	0.0200	0.0200	92.141	0.02	0.0815	4475	1
iso-octane	0.0000	0.0000	114.22	0.00	0.0000	6232	0
octanes	0.0000	0.0000	114.22	0.00	0.0000	7000	0
ethylbenzene	0.0000	0.0000	106.167	0.00	0.0000	5222	0
xylene	0.0100	0.0100	106.167	0.01	0.0470	5208	1
nonanes	0.0000	0.0000	128.25	0.00	0.0000	6997	0
Other NM/NE HC	6.4300	6.4299	102.09	6.56	29.0353	5200	334
Max Hydrogen Sulfide	0.0016	0.0016	34.08	0.00	0.0024	637	0
TOTALS	100	100	MW=	22.61	100.0000	total btu/scf	1335.06
				sg	0.7796		
				VOC wt%	29.1983		
				Toxic wt%	0.163		

Tank Emission Calculations Based on AP 42 Chapter 7 (June 2020, Section 7.1.3.1), Fixed Roof

Tank ID	**22-17-GST**
Tank Description	**1000 Gallon Gasoline Storage Tank**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Horizontal**
Tank Diameter (D ft)	**5.00**
Vertical Height/Horizontal Length (H_S ft)	**7.00**
Roof Height (H_R ft)	
Max Liquid Height (H_{LX} ft)	**5.00**
Avg Liquid Height (H_L ft)	**2.50**
Breather Vent Pressure Setting (P_{BP} psig)	
Breather Vent Vacuum Setting (P_{BV} psig)	
actual tank pressure (P_I psig)	**0.0**
Shell Paint Solar Absorptance (S_A)	**0.90**
Roof Paint Solar Absorptance (R_A)	**0.9**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	

Tank Shell Color/Shade	**Red - Primer**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Red - Primer**
Tank Roof Paint Condition	**average**
Roof Type	**horizontal tank**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**238.10**
Annual Turnovers, N	**9.73**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**137.44**
vapor space outage (H_{VO} ft)	**1.963**
vapor space volume (V_V ft^3)	**68.72**

Major City for Meterological Data	**Jackson, MS**
Site Elevation (ft)	**300**
Atmospheric Pressure (P_A psia)	**14.537**
Table 7.1-2 Liquid	**motor gasoline (RVP 13)**
*RVP**	
*API gravity**	
*°F basis for gv**	
bubble point psia	
API gravity at 60F	
API gravity at 100F	

Working Loss Product Factor (K_P)	**1**
working loss turnover factor K_N	**1.000**

*sales oil data determines RVP per API pub 4683

Tank contents (if not selected from Table 7.1-2):

component	*mole%*	*MW*	*lb/mole*	*wt%*	*Antoine constants (log $_{10}$, mmHg, °C) A*	*B*	*C*
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
	0.000		0.000	0.000			

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
hourly average maximum ambient temperature (T_{AX} °F)	56.50	60.80	68.10	75.70	83.00	89.00	91.10	91.20	86.50	77.10	66.30	58.10	75.30
hourly average minimum ambient temperature (T_{AN} °F)	37.00	39.30	45.90	53.30	62.50	69.20	72.10	71.40	65.50	53.90	43.90	37.90	54.30
daily total solar insolation factor (I btu/ft^2 day)	783	1039	1369	1762	1929	2025	1969	1849	1576	1262	922	726	1434
daily average ambient temperature (T_{AA} °F)	46.75	50.05	57.00	64.50	72.75	79.10	81.60	81.30	76.00	65.50	55.10	48.00	64.80
liquid bulk temperature (T_B °F)	48.86	52.86	60.70	69.26	77.96	84.57	86.92	86.29	80.26	68.91	57.59	49.96	68.67
average vapor temperature (T_V °F)	52.64	57.86	67.29	77.75	87.25	94.32	96.40	95.20	87.85	74.99	62.03	53.46	75.58
daily ambient temperature range (ΔT_A °R)	19.50	21.50	22.20	22.40	20.50	19.80	19.00	19.80	21.00	23.20	22.40	20.20	21.00
daily vapor temperature range (ΔT_V °R)	27.74	33.75	40.18	47.40	49.07	50.31	48.74	47.14	43.07	38.96	32.28	27.24	40.51
daily average liquid surface temperature (T_{LA} °F)	50.75	55.36	63.99	73.50	82.61	89.45	91.66	90.75	84.05	71.95	59.81	51.71	72.13
daily maximum liquid surface temperature (T_{LX} °F)	57.69	63.80	74.04	85.35	94.87	102.02	103.85	102.53	94.82	81.69	67.88	58.52	82.25
daily minimum liquid surface temperature (T_{LN} °F)	43.81	46.92	53.95	61.65	70.34	76.87	79.47	78.96	73.28	62.21	51.74	44.90	62.00
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	5.828	6.367	7.483	8.885	10.414	11.694	12.133	11.950	10.675	8.643	6.925	5.937	8.670
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	6.654	7.456	8.970	10.914	12.794	14.364	14.787	14.481	12.782	10.251	8.033	6.759	10.352
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	5.087	5.409	6.198	7.166	8.397	9.429	9.867	9.779	8.851	7.240	5.941	5.197	7.212
daily vapor pressure range (ΔP_V)	1.5673	2.0470	2.7721	3.7477	4.3964	4.9354	4.9203	4.7019	3.9312	3.0109	2.0921	1.5618	3.1396
vapor space expansion factor (K_E)	0.2343	0.3161	0.4697	0.7520	1.1569	1.8274	2.1352	1.9034	1.0972	0.5841	0.3370	0.2349	0.6113
vapor molecular weight (M_V lb/lbmole)	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00
monthly hours with avg = total annual	744	672	744	720	744	720	744	744	720	744	720	744	8,760
throughputs (ft^3/month) and avg = total annual	114	103	114	110	114	110	114	114	110	114	110	114	1,337
monthly turnovers (N/month) with avg = total annual	0.83	0.75	0.83	0.80	0.83	0.80	0.83	0.83	0.80	0.83	0.80	0.83	9.73
vented vapor saturation factor (K_S)	0.6225	0.6015	0.5622	0.5196	0.4799	0.4511	0.4420	0.4457	0.4737	0.5265	0.5812	0.6181	0.5257
vent setting correction factor (K_B)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
vapor density (W_V lb/ft^3)	0.0657	0.0711	0.0820	0.0955	0.1100	0.1220	0.1261	0.1244	0.1127	0.0934	0.0767	0.0669	0.0936
standing storage losses (L_S lb/month & avg is lb/yr)	45.00	43.96	56.17	63.29	75.32	80.80	86.31	85.19	74.64	63.94	50.81	45.77	771.21
working losses (L_W lb/month & avg is lb/yr)	7.46	7.29	9.31	10.49	12.49	13.40	14.31	14.13	12.38	10.60	8.43	7.59	127.88
total losses (L_T lb/month & avg is lb/yr)	52.46	51.24	65.49	73.78	87.81	94.20	100.62	99.32	87.01	74.55	59.23	53.36	899.09
max hourly Q in bbl/hour	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.010	0.011	0.013	0.015	0.017	0.019	0.019	0.019	0.017	0.014	0.012	0.010	
breathing/standing loss (L_S lb/hr)	0.060	0.065	0.075	0.107	0.175	0.288	0.341	0.302	0.168	0.086	0.071	0.062	
max hourly total loss (L_T lb/hr)	0.071	0.076	0.088	0.121	0.192	0.306	0.360	0.321	0.185	0.100	0.082	0.072	

L_S sum months	L_W sum months	L_T sum months
771.21	127.88	899.09

The monthly sums will be greater than the annual average since the monthly variables yield higher emissions

Emissions Summary:	**avg lbs/hr**	**max lbs/hr**	**lbs/yr**
Standing/Breathing Loss L_S	**0.086**	**0.341**	**754.451**
Working Loss L_W	**0.014**	**0.019**	**125.100**
Total Loss L_T	**0.100**	**0.360**	**879.552**

max hourly total loss may not add up to L_S + L_W as their max values may be in different months

VOC Profile Speciation Report

Profile Name : Gasoline - Summer Blend
Profile Number : 1014
Data Quality : B

Control Device : Uncontrolled
Reference(s) : 1
Data Source : A composite of four product types combined in proportion to 1979 sales figures for California was used to develop vapor samples which were analyzed using a dual detector FID/PID GC.

SCC Assignments: 40301003, 40301006, 40301009, 40301103, 40301203, 40400103, 40400106, 40400109 40400112, 40400115, 40400120, 40400203, 40400206, 40400209, 40400213, 40400406

Saroad	CAS Number	Name	Spec_MW	Spec_WT	Peak
43105		ISOMERS OF HEXANE	86.17	4.78	
43106		ISOMERS OF HEPTANE	100.20	1.53	
43107		ISOMERS OF OCTANE	114.23	0.05	
43108		ISOMERS OF NONANE	128.25	0.02	
43120		ISOMERS OF BUTENE	56.10	1.11	
43122		ISOMERS OF PENTANE	72.15	26.79	
43124		C9 OLEFINS	126.24	0.03	
43125		C10 OLEFINS	140.27	0.00	
43202	74-84-0	ETHANE	30.07	0.08	
43204	74-98-6	PROPANE	44.09	1.25	
43212	106-97-8	N-BUTANE	58.12	22.95	
43214	75-28-5	ISO-BUTANE	58.12	9.83	
43216	624-64-6	T-2-BUTENE	56.11	1.21	
43217	590-18-1	CIS-2-BUTENE	56.11	0.98	
43220	109-66-0	N-PENTANE	72.15	8.56	
43223	563-45-1	3-METHYL-1-BUTENE	70.13	0.40	
43224	109-67-1	1-PENTENE	70.13	1.02	
43225	563-46-2	2-METHYL-1-BUTENE	70.13	1.93	
43226	646-04-8	TRANS-2-PENTENE	70.13	1.61	
43227	627-20-3	CIS-2-PENTENE	70.13	0.79	
43228	513-35-9	2-METHYL-2-BUTENE	70.13	1.04	
43230	96-14-0	3-METHYL PENTANE	86.17	2.34	
43231	110-54-3	HEXANE	86.17	1.84	
43232	142-82-5	HEPTANE	100.20	0.32	
43233	111-65-9	OCTANE	114.23	0.02	
43242	287-92-3	CYCLOPENTANE	70.14	0.72	
43245	592-41-6	1-HEXENE	84.16	0.27	
43247	108-08-7	2,4-DIMETHYLPENTANE	100.20	0.51	
43248	110-82-7	CYCLOHEXANE	84.16	0.26	
43250	540-84-1	2,2,4-TRIMETHYLPENTANE	114.22	0.49	
43252	565-75-3	2,3,4-TRIMETHYLPENTANE	114.22	0.08	
43261	108-87-2	METHYLCYCLOHEXANE	98.21	0.13	
43262	96-37-7	METHYLCYCLOPENTANE	84.16	1.66	
43270	922-61-2	3-METHYL-T-2-PENTENE	84.16	0.09	
43271		3,5,5-TRIMETHYLHEXANE	128.26	0.10	
43278	592-13-2	2,5-DIMETHYLHEXANE	114.22	0.11	
43289		C6 OLEFINS	84.16	0.06	

VOC Profile Speciation Report - continued (profile 1014)

Saroad	CAS Number	Name	Spec_MW	Spec_WT	Peak
43291	75-83-2	2,2-DIMETHYLBUTANE	86.17	1.23	
43292	142-29-0	CYCLOPENTENE	68.11	0.25	
43293	27236-46-0	4-METHYL-T-2-PENTENE	84.18	0.25	
43294		C7 OLEFINS	98.18	0.06	
43295	589-34-4	3-METHYLHEXANE	100.20	0.49	
43298		3-METHYLHEPTANE	114.23	0.07	
43299		1-METHYLCYCLOHEXENE	96.17	0.05	
45102	1330-20-7	ISOMERS OF XYLENE	106.16	0.15	
45110		C10 AROMATIC	134.22	0.01	
45201	71-43-2	BENZENE	78.11	0.77	
45202	108-88-3	TOLUENE	92.13	0.66	
45203	100-41-4	ETHYLBENZENE	106.16	0.04	
45204	95-47-6	O-XYLENE	106.16	0.05	
45207	108-67-8	1,3,5-TRIMETHYLBENZENE	120.19	0.02	
45208	95-63-6	1,2,4-TRIMETHYLBENZENE	120.19	0.06	
45211	611-14-3	O-ETHYLTOLUENE	120.19	0.05	
45215	98-06-6	TERT-BUTYLBENZENE	134.21	0.00	
45218	141-93-5	M-DIETHYLBENZENE	134.22	0.00	
45225	526-73-8	1,2,3-TRIMETHYLBENZENE	120.19	0.05	
46712	95-13-6	INDENE	116.16	0.01	
98033		2,2,5-TRIMETHYLHEXANE	128.26	0.02	
98034	40504-55-7	T-2-HEXENE	84.16	0.30	
98035	592-43-8	C-2-HEXENE	84.16	0.42	
98054	107-39-1	2,4,4-TRIMETHYL-1-PENTENE	112.22	0.02	
TOTAL				99.99	

Tank Emission Calculations Based on AP 42 Chapter 7 (June 2020, Section 7.1.3.1), Fixed Roof

Tank ID	**23-17-DST**
Tank Description	**1000 Gallon Diesel Storage Tank**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Horizontal**
Tank Diameter (D ft)	**5.00**
Vertical Height/Horizontal Length (H_S ft)	**7.00**
Roof Height (H_R ft)	
Max Liquid Height (H_{LX} ft)	**5.00**
Avg Liquid Height (H_L ft)	**2.50**
Breather Vent Pressure Setting (P_{BP} psig)	
Breather Vent Vacuum Setting (P_{BV} psig)	
actual tank pressure (P_I psig)	**0.0**
Shell Paint Solar Absorptance (S_A)	**0.90**
Roof Paint Solar Absorptance (R_A)	**0.9**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	

Tank Shell Color/Shade	**Red - Primer**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Red - Primer**
Tank Roof Paint Condition	**average**
Roof Type	**horizontal tank**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**238.10**
Annual Turnovers, N	**9.73**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**137.44**
vapor space outage (H_{VO} ft)	**1.963**
vapor space volume (V_V ft^3)	**68.72**

Major City for Meterological Data	**Jackson, MS**
Site Elevation (ft)	**300**
Atmospheric Pressure (P_A psia)	**14.537**
Table 7.1-2 Liquid	**No. 2 fuel oil (diesel)**
*RVP**	
*API gravity**	
*°F basis for gv**	
bubble point psia	
API gravity at 60F	
API gravity at 100F	
Working Loss Product Factor (K_P)	**1**
working loss turnover factor K_N	**1.000**

*sales oil data determines RVP per API pub 4683

Tank contents (if not selected from Table 7.1-2):

component	*mole%*	*MW*	*lb/mole*	*wt%*	*Antoine constants (log_{10}, mmHg, °C) A*	*B*	*C*
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
	0.000		0.000	0.000			

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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
hourly average maximum ambient temperature (T_{AX} °F)	56.50	60.80	68.10	75.70	83.00	89.00	91.10	91.20	86.50	77.10	66.30	58.10	75.30
hourly average minimum ambient temperature (T_{AN} °F)	37.00	39.30	45.90	53.30	62.50	69.20	72.10	71.40	65.50	53.90	43.90	37.90	54.30
daily total solar insolation factor (I btu/ft^2 day)	783	1039	1369	1762	1929	2025	1969	1849	1576	1262	922	726	1434
daily average ambient temperature (T_{AA} °F)	46.75	50.05	57.00	64.50	72.75	79.10	81.60	81.30	76.00	65.50	55.10	48.00	64.80
liquid bulk temperature (T_B °F)	48.86	52.86	60.70	69.26	77.96	84.57	86.92	86.29	80.26	68.91	57.59	49.96	68.67
average vapor temperature (T_V °F)	52.64	57.86	67.29	77.75	87.25	94.32	96.40	95.20	87.85	74.99	62.03	53.46	75.58
daily ambient temperature range (ΔT_A °R)	19.50	21.50	22.20	22.40	20.50	19.80	19.00	19.80	21.00	23.20	22.40	20.20	21.00
daily vapor temperature range (ΔT_V °R)	27.74	33.75	40.18	47.40	49.07	50.31	48.74	47.14	43.07	38.96	32.28	27.24	40.51
daily average liquid surface temperature (T_{LA} °F)	50.75	55.36	63.99	73.50	82.61	89.45	91.66	90.75	84.05	71.95	59.81	51.71	72.13
daily maximum liquid surface temperature (T_{LX} °F)	57.69	63.80	74.04	85.35	94.87	102.02	103.85	102.53	94.82	81.69	67.88	58.52	82.25
daily minimum liquid surface temperature (T_{LN} °F)	43.81	46.92	53.95	61.65	70.34	76.87	79.47	78.96	73.28	62.21	51.74	44.90	62.00
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	0.005	0.006	0.007	0.010	0.013	0.016	0.017	0.017	0.014	0.010	0.006	0.005	0.010
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	0.006	0.007	0.010	0.014	0.019	0.023	0.025	0.024	0.019	0.013	0.008	0.006	0.013
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	0.004	0.004	0.005	0.007	0.009	0.011	0.012	0.012	0.010	0.007	0.005	0.004	0.007
daily vapor pressure range (ΔP_V)	0.0023	0.0032	0.0049	0.0075	0.0100	0.0123	0.0126	0.0119	0.0091	0.0059	0.0035	0.0023	0.0062
vapor space expansion factor (K_E)	0.0545	0.0658	0.0771	0.0894	0.0912	0.0925	0.0893	0.0865	0.0798	0.0737	0.0624	0.0534	0.0766
vapor molecular weight (M_V lb/lbmole)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00
monthly hours with avg = total annual	744	672	744	720	744	720	744	744	720	744	720	744	8,760
throughputs (ft^3/month) and avg = total annual	114	103	114	110	114	110	114	114	110	114	110	114	1,337
monthly turnovers (N/month) with avg = total annual	0.83	0.75	0.83	0.80	0.83	0.80	0.83	0.83	0.80	0.83	0.80	0.83	9.73
vented vapor saturation factor (K_S)	0.9995	0.9994	0.9992	0.9990	0.9986	0.9983	0.9982	0.9982	0.9986	0.9990	0.9993	0.9995	0.9990
vent setting correction factor (K_B)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
vapor density (W_V lb/ft^3)	0.0001	0.0001	0.0002	0.0002	0.0003	0.0004	0.0004	0.0004	0.0003	0.0002	0.0001	0.0001	0.0002
standing storage losses (L_S lb/month & avg is lb/yr)	0.02	0.02	0.03	0.04	0.05	0.06	0.06	0.06	0.05	0.04	0.02	0.02	0.45
working losses (L_W lb/month & avg is lb/yr)	0.01	0.01	0.02	0.02	0.03	0.04	0.04	0.04	0.03	0.02	0.02	0.01	0.31
total losses (L_T lb/month & avg is lb/yr)	0.03	0.03	0.05	0.06	0.08	0.10	0.10	0.10	0.08	0.06	0.04	0.03	0.77
max hourly Q in bbl/hour	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
breathing/standing loss (L_S lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
max hourly total loss (L_T lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

L_S sum months	L_W sum months	L_T sum months
0.45	0.31	0.77

The monthly sums will be greater than the annual average since the monthly variables yield higher emissions

Emissions Summary:	**avg lbs/hr**	**max lbs/hr**	**lbs/yr**
Standing/Breathing Loss L_S	**0.000**	**0.000**	**0.416**
Working Loss L_W	**0.000**	**0.000**	**0.290**
Total Loss L_T	**0.000**	**0.000**	**0.706**

max hourly total loss may not add up to L_S + L_W as their max values may be in different months

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