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
Mallalieu EOR Facility
AI No.: 10333; Permit No.: 1620-00038
Lincoln 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 Daily Leader. Additionally, a copy of the public notice and the complete OPGP NOI will be provided to the Lincoln County Public 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

Mallalieu EOR Facility
Lincoln County, MS

August 2024

Table of Contents

AI: 10333 Rec'd 8/6/2024 MSOPGP1620-00038

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*) : Mallalieu EOR Facility

C. Facility Air Permit/Coverage No. *(if known)* : 1620-00038

D. Agency Interest No. *(if known)* : 10333

E. Physical Address

1. Street Address: 1043 Mount Olive Road
2. City: Bogue Chitto
3. State: MS
4. County: Lincoln
5. Zip Code: 39629
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: Well surface location
2. Method of Collection (*check one*):
   ☐ GPS Specify coordinate system (NAD 83, etc.)
   ☐ Map Interpolation (Google Earth, etc.) ☑ Other: Plot plan
3. Latitude (*degrees/minutes/seconds)* : 31 29 39.20
4. Longitude (*degrees/minutes/seconds*): 90 24 41.20
5. Elevation (*feet*): 440±

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	4,000	barrels/day
Water	7,500	barrels/day
Other (Specify)		

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

Produced Material	Throughput	Units
Flared Gas	0.59	MMCF/day
Oil	4,000	barrels/day
Water	7,500	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**

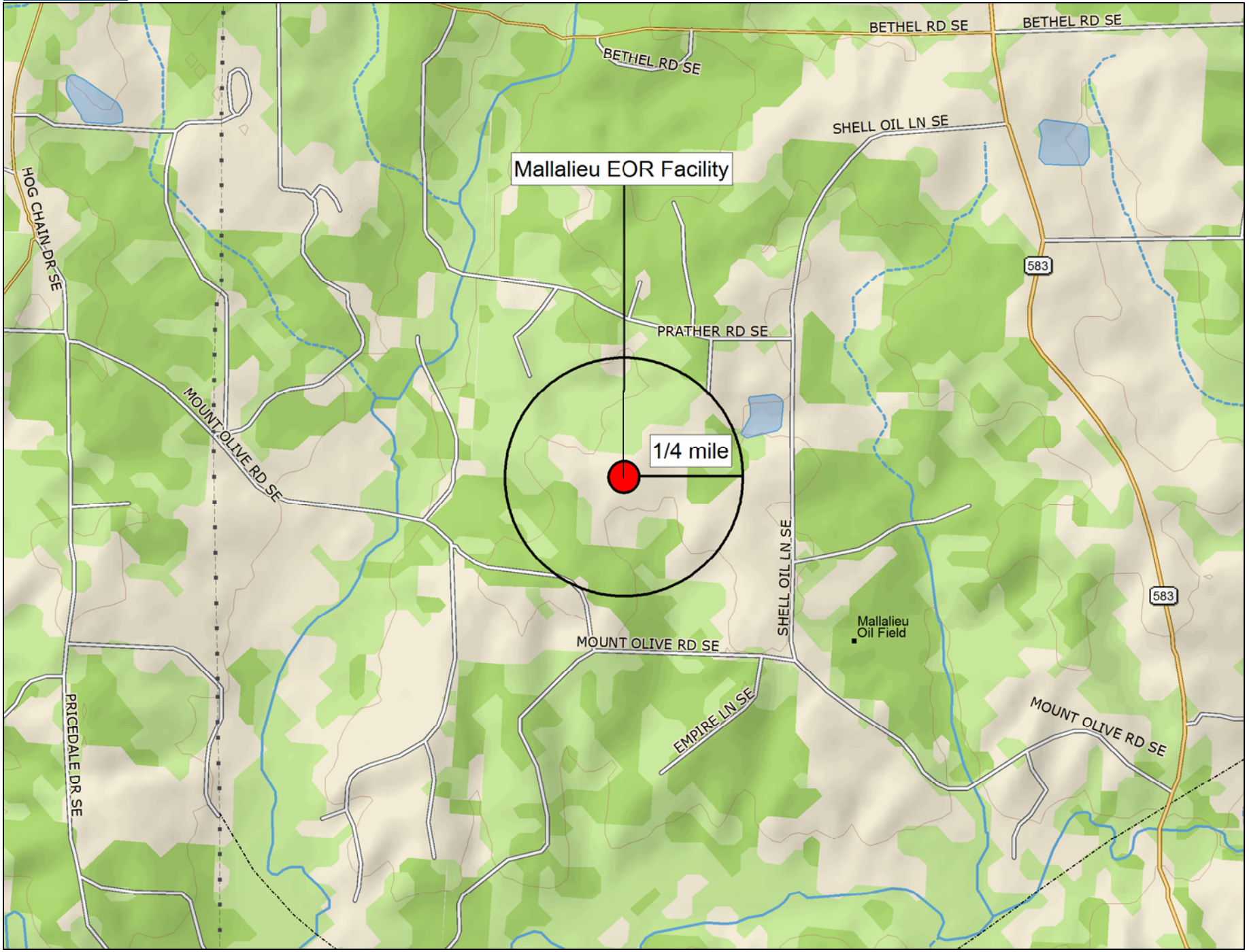
7/30/24 — **Date**

Rusty Shaw — **Printed Name**

7/30/24 — **Date**


Mallalieu EOR Facility
Prather-Rd-SE
Legend
1/4 mile
DNR-Mallalieu EOR Facility
DNR-Mallalieu EOR Facility
Shell-Oil-Ln-SE
Google earth
N


DNR-Mallalieu EOR Facility
© 2018 Google
Google earth



TN

MN (0.9°W)

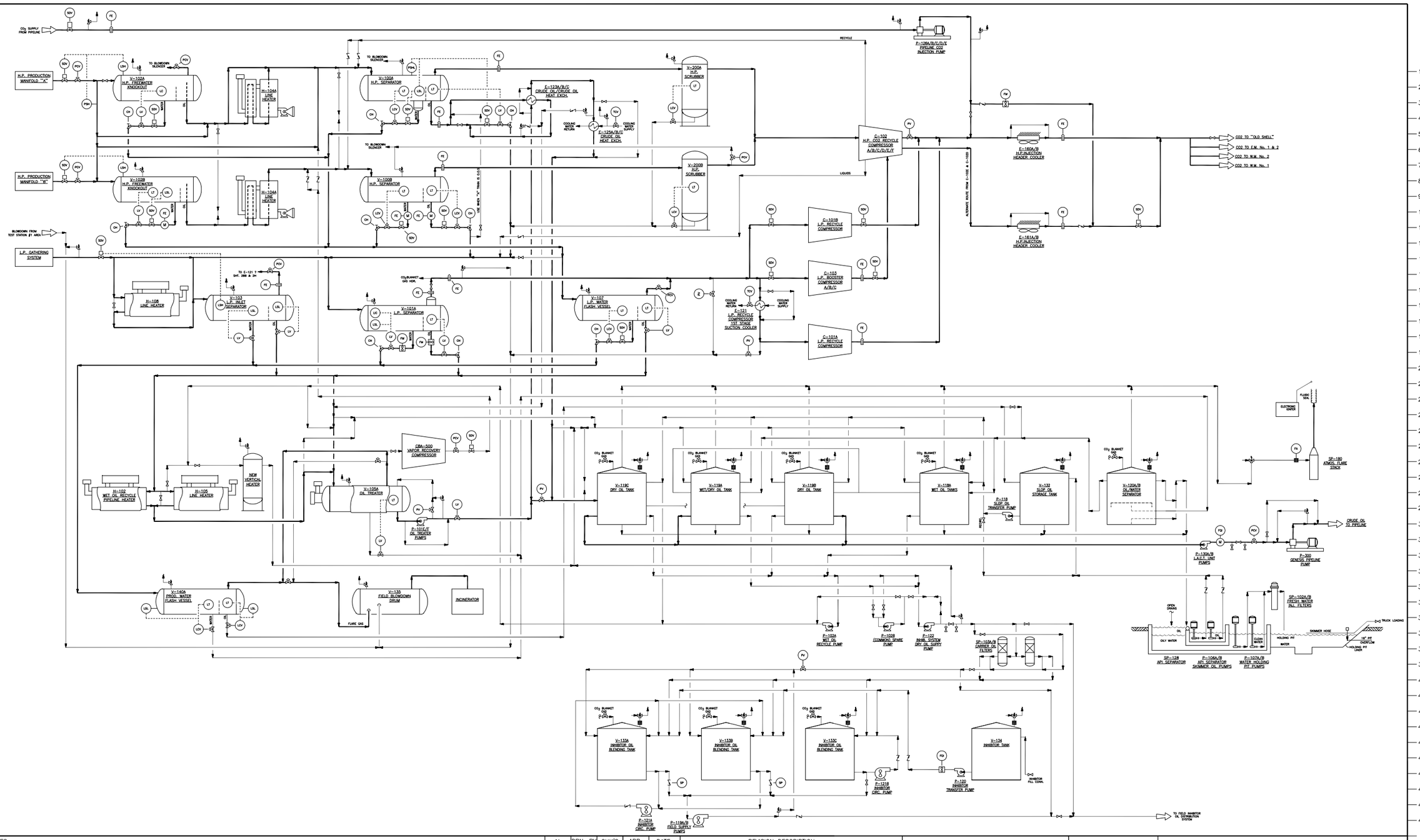
Scale 1 : 20,000

0 600 1200 1800 2400 3000 ft

0 180 360 540 720 900 m

1" = 1,666.7 ft

Data Zoom 13-0



NOTES:

No.	DRN. BY	CHK'D.	APP.	DATE	REVISION DESCRIPTION
A	DJO			8/12/10	ISSUED FOR FIELD WALKDOWN

JACOBS

PROJECT NUMBER: LUMX-3301

DATE:

Denbury Onshore, LLC

PROJECT MANAGER: R. ROSS	DESCRIPTION: WEST MALLALIEU CENTRAL FACILITY			
AFE No.:	SO No.:	AREA:	DRN. BY: DJO	SCALE: NTS
CADD. FILE: P:\LUMX1602\ENG\Piping\PFDs\WM-SPFD-CF.DWG	DATE: 4/15/10	CHANGED DATE: 4/15/10	DWG. No.: WM-SPFD-CF	REV. No.: A
DRAWING TITLE: OVERALL FACILITY PROCESS FLOW DIAGRAM				REV. DATE: 4/15/10

DWG: C:\TEMPO\WSU\LUM\MSYDenburyWestMallalieu\LUMX1603\C01D065\00001\A\C-SPFD-CF.dwg USER: haydelks
DATE: Jun 06, 2012 12:46pm

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
2-05-LH-BS	0.04	0.16	0.04	0.16	0.04	0.16	0.01	0.02	0.47	2.07	0.40	1.74	0.03	0.11	0.00	0.00	-	-	0.01	0.04
2b-13-HT-BS	0.04	0.16	0.04	0.16	0.04	0.16	0.01	0.02	0.47	2.07	0.40	1.74	0.03	0.11	0.00	0.00	-	-	0.01	0.04
3-05-LH-BS	0.08	0.37	0.08	0.37	0.08	0.37	0.01	0.06	1.12	4.89	0.94	4.11	0.06	0.27	0.00	0.00	-	-	0.02	0.09
4-05-SBP	-	-	-	-	-	-	-	-	-	-	-	-	0.22	0.08	0.00	0.00	-	-	0.14	0.04
5-05-OST-V	-	-	-	-	-	-	-	-	-	-	-	-	1.40	6.12	0.00	0.00	-	-	0.13	0.56
6-05-OST-V	-	-	-	-	-	-	-	-	-	-	-	-	34.53	151.23	0.00	0.00	-	-	2.31	10.12
7-05-OST-V	-	-	-	-	-	-	-	-	-	-	-	-	1.88	8.23	0.00	0.00	-	-	0.17	0.75
8a-05-GBT-CV	-	-	-	-	-	-	-	-	-	-	-	-	1.51	6.59	0.00	0.00	-	-	0.50	2.22
8b-05-GBT-CV	-	-	-	-	-	-	-	-	-	-	-	-	1.51	6.59	0.00	0.00	-	-	0.50	2.22
9a-05-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.08	0.00	0.00	-	-	0.00	0.01
9b-05-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.08	0.00	0.00	-	-	0.00	0.01
9c-09-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.11	0.00	0.00	-	-	0.00	0.01
10-05-SOT-V	-	-	-	-	-	-	-	-	-	-	-	-	0.15	0.66	0.00	0.00	-	-	0.01	0.06
11-05-IOT-V	-	-	-	-	-	-	-	-	-	-	-	-	1.82	7.94	0.00	0.00	-	-	0.27	1.06
12-05-IOT-V	-	-	-	-	-	-	-	-	-	-	-	-	1.82	7.94	0.00	0.00	-	-	0.27	1.06
13-05-ST	-	-	-	-	-	-	-	-	-	-	-	-	0.25	1.08	0.00	0.00	-	-	0.00	0.00
14-05-SEP-V	-	-	-	-	-	-	-	-	-	-	-	-	0.63	2.75	0.00	0.00	-	-	0.06	0.25
15-05-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.03	0.12	0.00	0.00	-	-	0.00	0.01
16-05-ST-V	-	-	-	-	-	-	-	-	-	-	-	-	0.12	0.54	0.00	0.00	-	-	0.01	0.05
17-05-ST-V	-	-	-	-	-	-	-	-	-	-	-	-	0.12	0.54	0.00	0.00	-	-	0.01	0.05
18-05-FE	-	-	-	-	-	-	-	-	-	-	-	-	1.27	5.58	0.00	0.00	-	-	0.00	0.05
19-05-F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20-05-VS	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00
21-05-CB	-	-	-	-	-	-	-	-	-	-	-	-	41.00	0.49	0.00	0.00	-	-	0.81	0.01
23-05-CB	-	-	-	-	-	-	-	-	-	-	-	-	41.00	0.49	0.00	0.00	-	-	0.81	0.01
29-09-OST-CV	-	-	-	-	-	-	-	-	-	-	-	-	57.62	252.33	0.00	0.00	-	-	3.86	16.88
30-09-IOT-CV	-	-	-	-	-	-	-	-	-	-	-	-	2.57	11.22	0.00	0.00	-	-	0.38	1.52
32-13-LH-BS	0.03	0.14	0.03	0.14	0.03	0.14	0.01	0.02	0.43	1.90	0.36	1.60	0.02	0.10	0.00	0.00	-	-	0.01	0.03
33-13-HT-BS	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.00	0.06	0.27	0.05	0.23	0.00	0.02	0.00	0.00	-	-	0.00	0.00
34a-13-LH-BS	0.28	1.24	0.28	1.24	0.28	1.24	0.04	0.19	3.72	16.31	3.13	13.70	0.20	0.90	0.00	0.00	-	-	0.07	0.30
34b-13-LH-BS	0.28	1.24	0.28	1.24	0.28	1.24	0.04	0.19	3.72	16.31	3.13	13.70	0.20	0.90	0.00	0.00	-	-	0.07	0.30
35a-13-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.01	0.00	0.00	-	-	0.00	0.00
35b-13-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.01	0.00	0.00	-	-	0.00	0.00
36-13-GST	-	-	-	-	-	-	-	-	-	-	-	-	0.07	0.30	0.00	0.00	-	-	0.00	0.00
37-13-CST	-	-	-	-	-	-	-	-	-	-	-	-	0.10	0.45	0.00	0.00	-	-	0.00	0.00

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
38-13-CST	-	-	-	-	-	-	-	-	-	-	-	-	0.09	0.39	0.00	0.00	-	-	0.00	0.00
39-13-CST	-	-	-	-	-	-	-	-	-	-	-	-	0.16	p	0.00	0.00	-	-	0.00	0.00
42-14-DST	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00
43-14-GST	-	-	-	-	-	-	-	-	-	-	-	-	0.10	0.43	0.00	0.00	-	-	0.00	0.01
44-15-LP-RG	-	-	-	-	-	-	-	-	-	-	-	-	5.35	23.44	0.00	0.00	-	-	0.54	2.43
Totals	**0.75**	**3.33**	**0.75**	**3.33**	**0.75**	**3.33**	**0.12**	**0.50**	**9.99**	**43.82**	**8.41**	**36.82**	**195.92**	**498.23**	**0.00**	**0.00**	**0.00**	**0.00**	**10.97**	**40.19**

[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
2-05-LH-BS	0.04	0.16	0.04	0.16	0.04	0.16	0.01	0.02	0.47	2.07	0.40	1.74	0.03	0.11	0.00	0.00	-	-
2b-13-HT-BS	0.04	0.16	0.04	0.16	0.04	0.16	0.01	0.02	0.47	2.07	0.40	1.74	0.03	0.11	0.00	0.00	-	-
3-05-LH-BS	0.08	0.37	0.08	0.37	0.08	0.37	0.01	0.06	1.12	4.89	0.94	4.11	0.06	0.27	0.00	0.00	-	-
4-05-SBP	-	-	-	-	-	-	-	-	-	-	-	-	0.22	0.08	0.00	0.00	-	-
5-05-OST-V	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.02	0.00	0.00	-	-
6-05-OST-V	-	-	-	-	-	-	-	-	-	-	-	-	0.12	0.50	0.00	0.00	-	-
7-05-OST-V	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.02	0.00	0.00	-	-
8a-05-GBT-CV	-	-	-	-	-	-	-	-	-	-	-	-	1.51	6.59	0.00	0.00	-	-
8b-05-GBT-CV	-	-	-	-	-	-	-	-	-	-	-	-	1.51	6.59	0.00	0.00	-	-
9a-05-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.08	0.00	0.00	-	-
9b-05-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.08	0.00	0.00	-	-
9c-09-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.11	0.00	0.00	-	-
10-05-SOT-V	-	-	-	-	-	-	-	-	-	-	-	-	0.15	0.66	0.00	0.00	-	-
11-05-IOT-V	-	-	-	-	-	-	-	-	-	-	-	-	1.82	7.94	0.00	0.00	-	-
12-05-IOT-V	-	-	-	-	-	-	-	-	-	-	-	-	1.82	7.94	0.00	0.00	-	-
13-05-ST	-	-	-	-	-	-	-	-	-	-	-	-	0.25	1.08	0.00	0.00	-	-
14-05-SEP-V	-	-	-	-	-	-	-	-	-	-	-	-	0.63	2.75	0.00	0.00	-	-
15-05-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.03	0.12	0.00	0.00	-	-
16-05-ST-V	-	-	-	-	-	-	-	-	-	-	-	-	0.12	0.54	0.00	0.00	-	-
17-05-ST-V	-	-	-	-	-	-	-	-	-	-	-	-	0.12	0.54	0.00	0.00	-	-
18-05-FE	-	-	-	-	-	-	-	-	-	-	-	-	1.27	5.58	0.00	0.00	-	-
19-05-F	0.27	1.18	0.27	1.18	0.27	1.18	0.00	0.00	1.44	6.32	12.37	54.19	2.33	10.25	0.00	0.00	-	-
20-05-VS	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	-	-
21-05-CB	-	-	-	-	-	-	-	-	-	-	-	-	41.00	0.49	0.00	0.00	-	-
23-05-CB	-	-	-	-	-	-	-	-	-	-	-	-	41.00	0.49	0.00	0.00	-	-
29-09-OST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.12	0.51	0.00	0.00	-	-
30-09-IOT-CV	-	-	-	-	-	-	-	-	-	-	-	-	2.57	11.22	0.00	0.00	-	-
32-13-LH-BS	0.03	0.14	0.03	0.14	0.03	0.14	0.01	0.02	0.43	1.90	0.36	1.60	0.02	0.10	0.00	0.00	-	-
33-13-HT-BS	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.00	0.06	0.27	0.05	0.23	0.00	0.02	0.00	0.00	-	-
34a-13-LH-BS	0.28	1.24	0.28	1.24	0.28	1.24	0.04	0.19	3.72	16.31	3.13	13.70	0.20	0.90	0.00	0.00	-	-
34b-13-LH-BS	0.28	1.24	0.28	1.24	0.28	1.24	0.04	0.19	3.72	16.31	3.13	13.70	0.20	0.90	0.00	0.00	-	-
35a-13-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.01	0.00	0.00	-	-
35b-13-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.01	0.00	0.00	-	-
36-13-GST	-	-	-	-	-	-	-	-	-	-	-	-	0.07	0.30	0.00	0.00	-	-

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
37-13-CST	-	-	-	-	-	-	-	-	-	-	-	-	0.10	0.45	0.00	0.00	-	-
38-13-CST	-	-	-	-	-	-	-	-	-	-	-	-	0.09	0.39	0.00	0.00	-	-
39-13-CST	-	-	-	-	-	-	-	-	-	-	-	-	0.16	0.71	0.00	0.00	-	-
42-14-DST	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	-	-
43-14-GST	-	-	-	-	-	-	-	-	-	-	-	-	0.10	0.43	0.00	0.00	-	-
44-15-LP-RG	-	-	-	-	-	-	-	-	-	-	-	-	5.35	23.44	0.00	0.00	-	-
Totals	**1.02**	**4.51**	**1.02**	**4.51**	**1.02**	**4.51**	**0.12**	**0.50**	**11.43**	**50.14**	**20.78**	**91.01**	**103.06**	**92.33**	**0.00**	**0.00**	**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
2-05-LH-BS	0.01	0.04	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	-	-	0.00	0.00	0.00	0.00
2b-13-HT-BS	0.01	0.04	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	-	-	0.00	0.00	0.00	0.00
3-05-LH-BS	0.02	0.09	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.09	-	-	0.00	0.00	0.00	0.00
4-05-SBP	0.14	0.04	-	-	0.01	0.00	-	-	-	-	0.08	0.03	0.00	0.00	-	-	0.00	0.00	0.00	0.00	-	-	0.04	0.01	0.01	0.00
5-05-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
6-05-OST-V	0.01	0.02	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.01	0.02	-	-	0.00	0.00	0.00	0.00
7-05-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
8a-05-GBT-CV	0.50	2.22	-	-	0.03	0.11	-	-	-	-	0.24	1.07	0.00	0.02	-	-	0.00	0.00	0.08	0.35	-	-	0.12	0.52	0.03	0.15
8b-05-GBT-CV	0.50	2.22	-	-	0.03	0.11	-	-	-	-	0.24	1.07	0.00	0.02	-	-	0.00	0.00	0.08	0.35	-	-	0.12	0.52	0.03	0.15
9a-05-WST-CV	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
9b-05-WST-CV	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
9c-09-WST-CV	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
10-05-SOT-V	0.01	0.06	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.01	0.06	-	-	0.00	0.00	0.00	0.00
11-05-IOT-V	0.27	1.06	-	-	0.00	0.00	-	-	-	-	0.00	0.01	0.01	0.04	-	-	0.00	0.00	0.13	0.56	0.06	0.25	0.02	0.00	0.05	0.20
12-05-IOT-V	0.27	1.06	-	-	0.00	0.00	-	-	-	-	0.00	0.01	0.01	0.04	-	-	0.00	0.00	0.13	0.56	0.06	0.25	0.02	0.00	0.05	0.20
13-05-ST	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
14-05-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
15-05-WST-CV	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
16-05-ST-V	0.01	0.05	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.01	0.05	-	-	0.00	0.00	0.00	0.00
17-05-ST-V	0.01	0.05	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.01	0.05	-	-	0.00	0.00	0.00	0.00
18-05-FE	0.00	0.05	-	-	0.00	0.00	-	-	-	-	0.00	0.01	0.00	0.00	-	-	0.00	0.00	0.00	0.02	-	-	0.00	0.01	0.00	0.01
19-05-F	0.10	0.47	-	-	0.01	0.04	-	-	-	-	0.02	0.09	0.00	0.00	-	-	0.00	0.00	0.07	0.32	-	-	0.00	0.02	0.00	0.00
20-05-VS	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
21-05-CB	0.81	0.01	-	-	0.11	0.00	-	-	-	-	0.09	0.00	0.01	0.00	-	-	0.00	0.00	0.47	0.01	-	-	0.10	0.00	0.03	0.00
23-05-CB	0.81	0.01	-	-	0.11	0.00	-	-	-	-	0.09	0.00	0.01	0.00	-	-	0.00	0.00	0.47	0.01	-	-	0.10	0.00	0.03	0.00
29-09-OST-CV	0.01	0.02	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.01	0.02	-	-	0.00	0.00	0.00	0.00
30-09-IOT-CV	0.38	1.52	-	-	0.00	0.00	-	-	-	-	0.00	0.01	0.01	0.06	-	-	0.00	0.00	0.18	0.78	0.09	0.37	0.03	0.00	0.07	0.30
32-13-LH-BS	0.01	0.03	-	-	0.00	0.00	-	-	-	-	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
33-13-HT-BS	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	0.00	0.00
34a-13-LH-BS	0.07	0.30	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.07	0.29	-	-	0.00	0.00	0.00	0.00
34b-13-LH-BS	0.07	0.30	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.07	0.29	-	-	0.00	0.00	0.00	0.00
35a-13-WST-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
35b-13-WST-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
36-13-GST	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
37-13-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

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
38-13-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
39-13-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
42-14-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
43-14-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
44-15-LP-RG	0.54	2.43	-	-	0.00	0.00	-	-	-	-	0.08	0.36	0.00	0.01	-	-	0.00	0.00	0.43	1.90	-	-	0.02	0.11	0.01	0.05
Totals:	**4.62**	**12.39**	**0.00**	**0.00**	**0.30**	**0.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.84**	**2.66**	**0.05**	**0.19**	**0.00**	**0.02**	**0.00**	**0.00**	**2.34**	**6.14**	**0.21**	**0.87**	**0.57**	**1.19**	**0.31**	**1.06**

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**						
2-05-LH-BS	**mass GHG**	2431.87	0.00	0.00	0.04	0.00	0.00					2431.91	
	CO_2e	2431.87	0.00	0.00	1.12	0.00	0.00						2432.99
2b-13-HT-BS	**mass GHG**	2431.87	0.00	0.00	0.04	0.00	0.00					2431.91	
	CO2e	2431.87	0.00	0.00	1.12	0.00	0.00						2432.99
3-05-LH-BS	**mass GHG**	5759.71	0.00	0.01	0.11	0.00	0.00					5759.83	
	CO2e	5759.71	0.00	2.65	3.08	0.00	0.00						5765.44
4-05-SBP	**mass GHG**	49.69	0.00	0.00	0.02	0.00	0.00					49.71	
	CO2e	49.69	0.00	0.00	0.56	0.00	0.00						50.25
5-05-OST-V	**mass GHG**	0.00	0.00	0.00	0.00	0.00	0.00					0.00	
	CO2e	0.00	0.00	0.00	0.00	0.00	0.00						0.00
6-05-OST-V	**mass GHG**	2.83	0.00	0.00	0.01	0.00	0.00					2.84	
	CO2e	2.83	0.00	0.00	0.28	0.00	0.00						3.11
7-05-OST-V	**mass GHG**	0.00	0.00	0.00	0.00	0.00	0.00					0.00	
	CO2e	0.00	0.00	0.00	0.00	0.00	0.00						0.00
8a-05-GBT-CV	**mass GHG**	1864.27	0.00	0.00	1.22	0.00	0.00					1865.49	
	CO2e	1864.27	0.00	0.00	34.16	0.00	0.00						1898.43
8b-05-GBT-CV	**mass GHG**	1864.27	0.00	0.00	1.22	0.00	0.00					1865.49	
	CO2e	1864.27	0.00	0.00	34.16	0.00	0.00						1898.43
9a-05-WST-CV	**mass GHG**	0.00	0.00	0.00	0.01	0.00	0.00					0.01	
	CO2e	0.00	0.00	0.00	0.28	0.00	0.00						0.28
9b-05-WST-CV	**mass GHG**	0.00	0.00	0.00	0.01	0.00	0.00					0.01	
	CO2e	0.00	0.00	0.00	0.28	0.00	0.00						0.28
9c-09-WST-CV	**mass GHG**	0.00	0.00	0.00	0.01	0.00	0.00					0.01	
	CO2e	0.00	0.00	0.00	0.28	0.00	0.00						0.28
10-05-SOT-V	**mass GHG**	0.00	0.00	0.00	0.04	0.00	0.00					0.04	
	CO2e	0.00	0.00	0.00	1.12	0.00	0.00						1.12
11-05-IOT-V	**mass GHG**	0.00	0.00	0.00	0.18	0.00	0.00					0.18	
	CO2e	0.00	0.00	0.00	5.04	0.00	0.00						5.04
12-05-IOT-V	**mass GHG**	0.00	0.00	0.00	0.18	0.00	0.00					0.18	
	CO2e	0.00	0.00	0.00	5.04	0.00	0.00						5.04
13-05-ST	**mass GHG**	0.00	0.00	0.00	0.00	0.00	0.00					0.00	
	CO2e	0.00	0.00	0.00	0.00	0.00	0.00						0.00
14-05-SEP-V	**mass GHG**	0.00	0.00	0.00	0.20	0.00	0.00					0.20	
	CO2e	0.00	0.00	0.00	5.60	0.00	0.00						5.60
15-05-WST-CV	**mass GHG**	0.00	0.00	0.00	0.01	0.00	0.00					0.01	
	CO2e	0.00	0.00	0.00	0.28	0.00	0.00						0.28
16-05-ST-V	**mass GHG**	0.00	0.00	0.00	0.03	0.00	0.00					0.03	
	CO2e	0.00	0.00	0.00	0.84	0.00	0.00						0.84
17-05-ST-V	**mass GHG**	0.00	0.00	0.00	0.03	0.00	0.00					0.03	
	CO2e	0.00	0.00	0.00	0.84	0.00	0.00						0.84
18-05-FE	**mass GHG**	25.75	0.00	0.00	0.33	0.00	0.00					26.08	
	CO2e	25.75	0.00	0.00	9.24	0.00	0.00						34.99

		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**						
19-05-F	**mass GHG**	12874.93	0.00	0.02	72.47	0.00	0.00					12947.42	
	CO2e	12874.93	0.00	5.30	2029.16	0.00	0.00						14909.39
20-05-VS	**mass GHG**	0.00	0.00	0.00	0.00	0.00	0.00					0.00	
	CO2e	0.00	0.00	0.00	0.00	0.00	0.00						0.00
21-05-CB	**mass GHG**	29.61	0.00	0.00	0.67	0.00	0.00					30.28	
	CO2e	29.61	0.00	0.00	18.76	0.00	0.00						48.37
23-05-CB	**mass GHG**	29.61	0.00	0.00	0.67	0.00	0.00					30.28	
	CO2e	29.61	0.00	0.00	18.76	0.00	0.00						48.37
29-09-OST-CV	**mass GHG**	2.83	0.00	0.00	0.01	0.00	0.00					2.84	
	CO2e	2.83	0.00	0.00	0.28	0.00	0.00						3.11
30-09-IOT-CV	**mass GHG**	0.00	0.00	0.00	0.21	0.00	0.00					0.21	
	CO2e	0.00	0.00	0.00	5.88	0.00	0.00						5.88
32-13-LH-BS	**mass GHG**	2239.88	0.00	0.00	0.04	0.00	0.00					2239.92	
	CO2e	2239.88	0.00	0.00	1.12	0.00	0.00						2241.00
33-13-HT-BS	**mass GHG**	319.99	0.00	0.00	0.01	0.00	0.00					320.00	
	CO2e	319.99	0.00	0.00	0.28	0.00	0.00						320.27
34a-13-LH-BS	**mass GHG**	19199.03	0.00	0.03	0.37	0.00	0.00					19199.43	
	CO2e	19199.03	0.00	7.95	10.36	0.00	0.00						19217.34
34b-13-LH-BS	**mass GHG**	19199.03	0.00	0.03	0.37	0.00	0.00					19199.43	
	CO2e	19199.03	0.00	7.95	10.36	0.00	0.00						19217.34
35a-13-WST-CV	**mass GHG**	0.00	0.00	0.00	0.00	0.00	0.00					0.00	
	CO2e	0.00	0.00	0.00	0.00	0.00	0.00						0.00
35b-13-WST-CV	**mass GHG**	0.00	0.00	0.00	0.00	0.00	0.00					0.00	
	CO2e	0.00	0.00	0.00	0.00	0.00	0.00						0.00
36-13-GST	**mass GHG**	0.00	0.00	0.00	0.00	0.00	0.00					0.00	
	CO2e	0.00	0.00	0.00	0.00	0.00	0.00						0.00
37-13-CST	**mass GHG**	0.00	0.00	0.00	0.00	0.00	0.00					0.00	
	CO2e	0.00	0.00	0.00	0.00	0.00	0.00						0.00
38-13-CST	**mass GHG**	0.00	0.00	0.00	0.00	0.00	0.00					0.00	
	CO2e	0.00	0.00	0.00	0.00	0.00	0.00						0.00
39-13-CST	**mass GHG**	0.00	0.00	0.00	0.00	0.00	0.00					0.00	
	CO2e	0.00	0.00	0.00	0.00	0.00	0.00						0.00
42-14-DST	**mass GHG**	0.00	0.00	0.00	0.00	0.00	0.00					0.00	
	CO2e	0.00	0.00	0.00	0.00	0.00	0.00						0.00
43-14-GST	**mass GHG**	0.00	0.00	0.00	0.00	0.00	0.00					0.00	
	CO2e	0.00	0.00	0.00	0.00	0.00	0.00						0.00
41-14-WST	**mass GHG**	184.32	0.00	0.00	0.50	0.00	0.00					184.82	
	CO2e	184.32	0.00	0.00	14.00	0.00	0.00						198.32
FACILITY TOTAL	**mass GHG**	**68509.49**	**0.00**	**0.09**	**79.01**	**0.00**	**0.00**					**68588.59**	
	CO_2e	**68509.49**	**0.00**	**23.85**	**2212.28**	**0.00**	**0.00**						**70745.62**

[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
2-05-LH-BS	V	No	15	440±	500	0.5	142	0	31 29 39.20	90 24 41.20
2b-13-HT-BS	V	No	15	440±	500	0.5	142	0	31 29 39.20	90 24 41.20
3-05-LH-BS	V	No	15	440±	500	0.5	336	0	31 29 39.20	90 24 41.20
5-05-OST-V	V	No	24.1	440±	70	0.5	<0.01	0	31 29 39.20	90 24 41.20
6-05-OST-V	V	No	24	440±	70	0.5	0.01	0	31 29 39.20	90 24 41.20
7-05-OST-V	V	No	24.1	440±	70	0.4	<0.01	0	31 29 39.20	90 24 41.20
8a-05-GBT-CV	V	No	28	440±	70	0.3	14.5	0	31 29 39.20	90 24 41.20
8b-05-GBT-CV	V	No	27	440±	70	0.3	14.5	0	31 29 39.20	90 24 41.20
9a-05-WST-CV	V	No	17	440±	70	0.8	<0.01	0	31 29 39.20	90 24 41.20
9b-05-WST-CV	V	No	17	440±	70	0.8	<0.01	0	31 29 39.20	90 24 41.20
9c-09-WST-CV	V	No	17	440±	70	0.8	<0.01	0	31 29 39.20	90 24 41.20
10-05-SOT-V	V	No	18	440±	70	0.25	0.01	0	31 29 39.20	90 24 41.20
11-05-IOT-V	V	No	20	440±	70	0.2	0.49	0	31 29 39.20	90 24 41.20
12-05-IOT-V	V	No	20	440±	70	0.2	0.49	0	31 29 39.20	90 24 41.20
13-05-ST	H	No	16	440±	70	0.1	<0.01	0	31 29 39.20	90 24 41.20
14-05-SEP-V	V	No	8	440±	70	800 ft^2	<0.01	0	31 29 39.20	90 24 41.20
15-05-WST-CV	V	No	26	440±	70	0.25	0.03	0	31 29 39.20	90 24 41.20
16-05-ST-V	V	No	20	440±	70	0.5 ft^2	0.08	0	31 29 39.20	90 24 41.20
17-05-ST-V	V	No	20	440±	70	0.5 ft^2	0.08	0	31 29 39.20	90 24 41.20
19-05-F	V	No	25	440±	1500	1	170	0	31 29 39.20	90 24 41.20
29-09-OST-CV	V	No	20	440±	70	0	0.06	0	31 29 39.20	90 24 41.20
30-09-IOT-CV	V	No	25	440±	70	0.2	0.64	0	31 29 39.20	90 24 41.20
32-13-LH-BS	V	No	15	440±	500	0.5	131	0	31 29 39.20	90 24 41.20
33-13-HT-BS	V	No	15	440±	500	0.5	18.7	0	31 29 39.20	90 24 41.20
34a-13-LH-BS	V	No	15	440±	500	1	280	0	31 29 39.20	90 24 41.20

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
34b-13-LH-BS	V	No	15	440±	500	1.0	280	0	31 29 39.20	90 24 41.20
35a-13-WST-CV	V	No	20	440±	70	0	0.01	0	31 29 39.20	90 24 41.20
35b-13-WST-CV	V	No	20	440±	70	0.2	0.01	0	31 29 39.20	90 24 41.20
36-13-GST	H	No	15	440±	70	0	<0.01	0	31 29 39.20	90 24 41.20
37-13-CST	H	No	2.9	440±	70	0.1	<0.01	0	31 29 39.20	90 24 41.20
38-13-CST	H	No	10	440±	70	0	<0.01	0	31 29 39.20	90 24 41.20
39-13-CST	H	No	8	440±	70	0.1	<0.01	0	31 29 39.20	90 24 41.20
42-14-DST	H	No	7	440±	70	0	<0.01	0	31 29 39.20	90 24 41.20
43-14-GST	H	No	7	440±	70	0.2	0.05	0	31 29 39.20	90 24 41.20
44-15-LP-RG	V	No	15	440±	70	0.5	0.57	0	31 29 39.20	90 24 41.20

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

Denbury Onshore, LLC
Mallalieu EOR Facility
Lincoln 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
2-05-LH-BS	AA-105a		3.8 MMBTU/Hr Heater Treater-Burner Stack (V-105A)		3.8 MMBTU/Hr	24	7	52.143
2b-13-HT-BS	AA-105b		3.8 MMBTU/Hr Heater Treater-Burner Stack (V-105B)		3.8 MMBTU/Hr	24	7	52.143
3-05-LH-BS	AA-106		9 MMBTU/Hr Line Heater-Burner Stack (H-106)		9 MMBTU/Hr	24	7	52.143
4-05-SBP	AA-107		Sand Blowdown Pit (SP-120)		438,000 BWPY	(730)	-	-
5-05-OST-V	AA-118	a	3000 BBL Wet Oil Tank-Vent (V-118A)	19-05-F	36,500 BOPY	24	7	52.143
6-05-OST-V	AA-119a	a	3000 BBL Wet/Dry Oil Tank-Vent (V-119A)	19-05-F	547,500 BOPY	24	7	52.143
7-05-OST-V	AA-119b	a	5000 BBL Dry Oil Tank-Vent (V-119B)	19-05-F	36,500 BOPY	24	7	52.143
8a-05-GBT-CV	AA-120a		1500 BBL Water Storage Tank-Common Vent (V-120A)		1,368,750 BWPY & 1,368.75 BOPY	24	7	52.143
8b-05-GBT-CV	AA-120b		1500 BBL Water Storage Tank-Common Vent (V-120B)		1,368,750 BWPY & 1,368.75 BOPY	24	7	52.143
9a-05-WST-CV	AA-129a		2000 BBL Produced Water Tank-Vent (V-129A)		84,000 Gallons	24	7	52.143
9b-05-WST-CV	AA-129b		2000 BBL Produced Water Tank-Vent (V-129B)		84,000 Gallons	24	7	52.143
9c-09-WST-CV	AA-129c		4500 BBL Produced Water Tank-Common Vent (V-129C)		189,000 Gallons	24	7	52.143
10-05-SOT-V	AA-132		300 BBL Slop Oil Tank-Vent (V-132)		2,737.5 BOPY	24	7	52.143
11-05-IOT-V	AA-133a		1000 BBL Inhibitor Oil Tank-Vent (V-133A)		11,430 BBLs/Yr	24	7	52.143
12-05-IOT-V	AA-133b		1000 BBL Inhibitor Oil Tank-Vent (V-133B)		11,430 BBLs/Yr	24	7	52.143
13-05-ST	AA-134		152 BBL Corrosion Chemical Storage Tank-Vent (V-134)		420,000 Gallons/Yr	24	7	52.143
14-05-SEP-V	AA-135		API Oil/Water Separator		7,300 BOPY	24	7	52.143
15-05-WST-CV	AA-136		3000 BBL Salt Water Storage Tank-Vent (V-152)		126,000 Gallons	24	7	52.143
16-05-ST-V	AA-137		API Separator Tank-Vent (V-154A)		109.5 BOPY	24	7	52.143
17-05-ST-V	AA-138		API Separator Tank-Vent (V-154B)		109.5 BOPY	24	7	52.143
18-05-FE	AA-139		Fugitive Emissions		N/A	24	7	52.143
19-05-F	AA-140	b	Control Flare		214 MMSCF/Yr	24	7	52.143
20-05-VS	AA-141	c	Vent Scrubber (V-135)		N/A	24	7	52.143
21-05-CB	AA-142		High Pressure Compressor Blowdowns		557 MSCF/Yr	(24)	-	-
23-05-CB	AA-144		Low Pressure Compressor Blowdowns		557 MSCF/Yr	(24)	-	-
29-09-OST-CV	AA-147	a	5000 BBL Dry Oil Tank-Common Vent (V-119C)	19-05-F	912,500 BOPY	24	7	52.143
30-09-IOT-CV	AA-148		1500 BBL Inhibitor Oil Tank-Common Vent (V-133C)		17,140 BBLs/Yr	24	7	52.143
32-13-LH-BS	AA-150		3.5 MMBTU/Hr Line Heater-Burner Stack (H-108)		3.5 MMBTU/Hr	24	7	52.143
33-13-HT-BS	AA-151		500 MBTU/Hr Heater Treater-Burner Stack (V-118)		500 MBTU/Hr	24	7	52.143
34a-13-LH-BS	AA-152		30 MMBTU/Hr Line Heater-Burner Stack (H-104A)		30 MMBTU/Hr	24	7	52.143
34b-13-LH-BS	AA-153		30 MMBTU/Hr Line Heater-Burner Stack (H-104B)		30 MMBTU/Hr	24	7	52.143
35a-13-WST-CV	AA-154		400 BBL Water Storage Tank-Common Vent (V-154A)		16,800 Gallons	24	7	52.143
35b-13-WST-CV	AA-155		400 BBL Water Storage Tank-Common Vent (V-154B)		16,800 Gallons	24	7	52.143
36-13-GST	AA-157		100 BBL Glycol Storage Tank (V-136)		10,000 Gallons/Yr	24	7	52.143

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
37-13-CST	AA-158		10 - Organic Chemical Blend Storage Tanks (≤ 550 Gallons)		2,000 Gallons/Yr Each	24	7	52.143
38-13-CST	AA-159		Organic Chemical Blend Storage Tank (≤ 2,000 Gallons)		210,000 Gallons/Yr	24	7	52.143
39-13-CST	AA-160		5 - Organic Chemical Blend Storage Tanks (≤ 800 Gallons)		42,000 Gallons/Yr Each	24	7	52.143
41-14-WST		d	5000 BBL Source Water Tank		210,000 Gallons	24	7	52.143
42-14-DST	AA-161		1000 Gallon Diesel Storage Tank		10,000 Gallons/Yr	24	7	52.143
43-14-GST	AA-156		1000 Gallon Gasoline Storage Tank		9,000 Gallons/Yr	24	7	52.143
44-15-LP-RG	AA-101	e	Low Pressure-Relief Gas (AA-101)		3.5 MMSCF/Yr	(e)	-	-

Footnotes:

a *Vapors from this source are routed to the control flare (19-05-F) for combustion, except during brief intervals when thief hatches are opened for purposes of sampling, gauging, etc. It should be noted that emissions reported for these sources are associated with those occurrences when thief hatches are opened.*

b *Routine emission limits for this source accounts for vapors from the oil storage tanks, flare gas, and the pilot & purge gas streams.*

c *Routine emission limits for this source accounts for facility low pressure relief gas and the pilot gas stream. This would occur only on an emergency/non-routine basis.*

d *This source contains freshwater only and does not have any emissions associated with it.*

e *Emission limits for this source account for any off-gas from the treaters and produced water flash vessel not captured by the VRU.*

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

Fuel Burning Equipment – External Combustion Sources

Section OPGP-C

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-105a & AA-105b [2-05-LH-BS (V-105A) & 2b-13-HT-BS (V-105B)]

B. Equipment Description: 3.8 MMBTU/Hr Heater Treater-Burner Stack

C. Manufacturer: Unknown D. Date of Manufacture and No.: Unknown

E. Maximum Heat Input (higher heating value): 3.8 MMBtu/hr F. Nominal Heat Input Capacity: 3.8 MMBtu/hr

G. Use: ☐ Line Heater ☒ Heater Treater ☐ TEG Burner

☐ Space Heat ☐ Process Heat ☐ Other (describe): _____

H. Heat Mechanism: ☐ Direct ☒ Indirect

I. Burner Type (e.g., forced draft, natural draft, etc.): _____

J. Additional Design Controls (e.g., FGR, etc.): N/A

K. Status: ☒ Operating ☐ Proposed ☐ Under Construction

2005

2. Fuel Type

Complete the following table, identifying each type of fuel and the amount used. Specify the units for heat content, hourly usage, and yearly usage.

FUEL TYPE	HEAT CONTENT	% SULFUR	% ASH	MAXIMUM HOURLY USAGE	MAXIMUM YEARLY USAGE
Produced Field Gas	1007 BTU/ft^3	<0.0007	N/A	4,716.98 scf	41.3 MMscf

Please list any fuel components that are hazardous air pollutants and the percentage in the fuel:

_____

_____

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

Fuel Burning Equipment – External Combustion Sources

Section OPGP-C

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-106 [3-05-LH-BS (H-106)]

B. Equipment Description: 9 MMBTU/Hr Line Heater-Burner Stack

C. Manufacturer: Unknown D. Date of Manufacture and No.: Unknown

E. Maximum Heat Input (higher heating value): 9 MMBtu/hr F. Nominal Heat Input Capacity: 9 MMBtu/hr

G. Use: ☒ Line Heater ☐ Heater Treater ☐ TEG Burner

☐ Space Heat ☐ Process Heat ☐ Other (describe): _____

H. Heat Mechanism: ☐ Direct ☒ Indirect

I. Burner Type (e.g., forced draft, natural draft, etc.): _____

J. Additional Design Controls (e.g., FGR, etc.): N/A

K. Status: ☒ Operating ☐ Proposed ☐ Under Construction

2005

2. Fuel Type

Complete the following table, identifying each type of fuel and the amount used. Specify the units for heat content, hourly usage, and yearly usage.

FUEL TYPE	HEAT CONTENT	% SULFUR	% ASH	MAXIMUM HOURLY USAGE	MAXIMUM YEARLY USAGE
Produced Field Gas	1007 BTU/ft^3	<0.0007	N/A	11,171.80 scf	97.9 MMscf

Please list any fuel components that are hazardous air pollutants and the percentage in the fuel:

_____

_____

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

Fuel Burning Equipment – External Combustion Sources

Section OPGP-C

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-150 [32-13-LH-BS (H-108)]

B. Equipment Description: 3.5 MMBTU/Hr Line Heater-Burner Stack

C. Manufacturer: Unknown D. Date of Manufacture and No.: Unknown

E. Maximum Heat Input (higher heating value): 3.5 MMBtu/hr F. Nominal Heat Input Capacity: 3.5 MMBtu/hr

G. Use: ☒ Line Heater ☐ Heater Treater ☐ TEG Burner

☐ Space Heat ☐ Process Heat ☐ Other (describe): _____

H. Heat Mechanism: ☐ Direct ☒ Indirect

I. Burner Type (e.g., forced draft, natural draft, etc.): _____

J. Additional Design Controls (e.g., FGR, etc.): N/A

K. Status: ☒ Operating ☐ Proposed ☐ Under Construction

2013

2. Fuel Type

Complete the following table, identifying each type of fuel and the amount used. Specify the units for heat content, hourly usage, and yearly usage.

FUEL TYPE	HEAT CONTENT	% SULFUR	% ASH	MAXIMUM HOURLY USAGE	MAXIMUM YEARLY USAGE
Produced Field Gas	1007 BTU/ft^3	<0.0007	N/A	4,344.59 scf	38.1 MMscf

Please list any fuel components that are hazardous air pollutants and the percentage in the fuel:

_____

_____

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

Fuel Burning Equipment – External Combustion Sources

Section OPGP-C

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-151 [33-13-HT-BS (V-118)]

B. Equipment Description: 500 MBTU/Hr Heater Treater-Burner Stack

C. Manufacturer: Unknown D. Date of Manufacture and No.: Unknown

E. Maximum Heat Input (higher heating value): 0.500 MMBtu/hr F. Nominal Heat Input Capacity: 0.500 MMBtu/hr

G. Use: ☐ Line Heater ☒ Heater Treater ☐ TEG Burner

☐ Space Heat ☐ Process Heat ☐ Other (describe): _____

H. Heat Mechanism: ☐ Direct ☒ Indirect

I. Burner Type (e.g., forced draft, natural draft, etc.): _____

J. Additional Design Controls (e.g., FGR, etc.): N/A

K. Status: ☒ Operating ☐ Proposed ☐ Under Construction

2013

2. Fuel Type

Complete the following table, identifying each type of fuel and the amount used. Specify the units for heat content, hourly usage, and yearly usage.

FUEL TYPE	HEAT CONTENT	% SULFUR	% ASH	MAXIMUM HOURLY USAGE	MAXIMUM YEARLY USAGE
Produced Field Gas	1007 BTU/ft^3	<0.0007	N/A	620.66 scf	5.47 MMscf

Please list any fuel components that are hazardous air pollutants and the percentage in the fuel:

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

Fuel Burning Equipment – External Combustion Sources

Section OPGP-C

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-155 & AA-153 [34a-13-LH-BS (H-104A) & 34b-13-LH-BS (H-104B]

B. Equipment Description: 30 MMBTU/Hr Line Heater-Burner Stack

C. Manufacturer: Unknown D. Date of Manufacture and No.: Unknown

E. Maximum Heat Input (higher heating value): 30 MMBtu/hr F. Nominal Heat Input Capacity: 30 MMBtu/hr

G. Use: ☒ Line Heater ☐ Heater Treater ☐ TEG Burner

☐ Space Heat ☐ Process Heat ☐ Other (describe): _____

H. Heat Mechanism: ☐ Direct ☒ Indirect

I. Burner Type (e.g., forced draft, natural draft, etc.): _____

J. Additional Design Controls (e.g., FGR, etc.): N/A

K. Status: ☒ Operating ☐ Proposed ☐ Under Construction

2013

2. Fuel Type

Complete the following table, identifying each type of fuel and the amount used. Specify the units for heat content, hourly usage, and yearly usage.

FUEL TYPE	HEAT CONTENT	% SULFUR	% ASH	MAXIMUM HOURLY USAGE	MAXIMUM YEARLY USAGE
Produced Field Gas	1007 BTU/ft^3	<0.0007	N/A	37,239.32 scf	326.22 MMscf

Please list any fuel components that are hazardous air pollutants and the percentage in the fuel:

_____

_____

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-118 [5-05-OST-V (V-118A)]

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: 2005

2. Tank Data

A. Tank Specifications:

1.	Design capacity	126,000	gallons		
2.	True vapor pressure at storage temperature:	4.611	psia @	69.88	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	5.299	psia @	77.71	ºF
4.	Reid vapor pressure at storage temperature:	6.18	psia @	69.88	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: 19-05-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: 24.1 feet
2. Shell Diameter: 29.7 feet
3. Maximum Liquid Height: 23.1 feet
4. Average Liquid Height: 11.55 feet
5. Working Volume: 126,000 gal
6. Turnovers per year: 12.80
7. Maximum throughput: 36,500 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: 0.93 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	3.10*	3.02*	6.12*

**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-119a [6-05-OST-V (V-119A)]

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: 2005

2. Tank Data

A. Tank Specifications:

1.	Design capacity	126,000	gallons		
2.	True vapor pressure at storage temperature:	4.611	psia @	69.88	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	5.299	psia @	77.71	ºF
4.	Reid vapor pressure at storage temperature:	6.18	psia @	69.88	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: 19-05-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: 24.1 feet
2. Shell Diameter: 29.7 feet
3. Maximum Liquid Height: 23.1 feet
4. Average Liquid Height: 11.55 feet
5. Working Volume: 126,000 gal
6. Turnovers per year: 192.06
7. Maximum throughput: 547,500 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: 0.93 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	46.55*	3.02*	49.57*

**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-119b [7-05-OST-V (V-119B)]

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: 2005

2. Tank Data

A. Tank Specifications:

1.	Design capacity	210,000	gallons		
2.	True vapor pressure at storage temperature:	4.626	psia @	70.05	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	5.315	psia @	77.88	ºF
4.	Reid vapor pressure at storage temperature:	6.18	psia @	70.05	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: 19-05-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: 24.1 feet
2. Shell Diameter: 38.6 feet
3. Maximum Liquid Height: 23.1 feet
4. Average Liquid Height: 11.55 feet
5. Working Volume: 210,000 gal
6. Turnovers per year: 7.58
7. Maximum throughput: 36,500 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

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	3.11*	5.12*	8.23*

**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-120a & AA-120b [8a-05-GBT-CV (V-120A) & 8b-05-GBT-CV (V-120B)]

B. Product(s) Stored: Produced Oil & 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: 2005

2. Tank Data

A. Tank Specifications:

1.	Design capacity	63,000	gallons		
2.	True vapor pressure at storage temperature:	0.363	psia @	69.66	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	0.472	psia @	77.50	ºF
4.	Reid vapor pressure at storage temperature:	0.363	psia @	69.66	ºF
5.	Density of product at storage temperature:	N/A	lb/gal		
6.	Molecular weight of product vapor at storage temp.	18.42	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: 24.1 feet
2. Shell Diameter: 21.5 feet
3. Maximum Liquid Height: 23.1 feet
4. Average Liquid Height: 11.55 feet
5. Working Volume: 63,000 gal
6. Turnovers per year: 917.17
7. Maximum throughput: 1,370,118.75 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	3.38	0.06	3.44

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-129a & AA-129b [9a-05-WST-CV (V-129A) & 9b-05-WST-CV (V-129B)]

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: 2003

2. Tank Data

A. Tank Specifications:

1.	Design capacity	84,000	gallons		
2.	True vapor pressure at storage temperature:	0.365	psia @	70.15	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	0.475	psia @	77.98	ºF
4.	Reid vapor pressure at storage temperature:	0.365	psia @	70.15	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: 16.0 feet
2. Shell Diameter: 29.89 feet
3. Maximum Liquid Height: 15.0 feet
4. Average Liquid Height: 7.5 feet
5. Working Volume: 84,000 gal
6. Turnovers per year: 0.00
7. Maximum throughput: 0.00 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: 0.93 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	0.00	0.08	0.08

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-129c [9c-09-WST-CV (V-129C)]

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: 2005

2. Tank Data

A. Tank Specifications:

1.	Design capacity	189,000	gallons		
2.	True vapor pressure at storage temperature:	0.362	psia @	69.88	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	0.470	psia @	77.71	ºF
4.	Reid vapor pressure at storage temperature:	0.362	psia @	69.88	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: 24.1 feet
2. Shell Diameter: 29.7 feet
3. Maximum Liquid Height: 23.1 feet
4. Average Liquid Height: 11.55 feet
5. Working Volume: 189,000 gal
6. Turnovers per year: 0.00
7. Maximum throughput: 0.00 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: 0.93 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	0.11	0.11

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-132 [10-05-SOT-V (V-132)]

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: Prior to 2005

2. Tank Data

A. Tank Specifications:

1.	Design capacity	12,600	gallons		
2.	True vapor pressure at storage temperature:	4.588	psia @	69.59	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	5.272	psia @	77.43	ºF
4.	Reid vapor pressure at storage temperature:	6.18	psia @	69.59	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: 19-05-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: 15 feet
2. Shell Diameter: 12 feet
3. Maximum Liquid Height: 14 feet
4. Average Liquid Height: 7 feet
5. Working Volume: 12,600 gal
6. Turnovers per year: 9.71
7. Maximum throughput: 2,737.5 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	0.23*	0.43*	0.66*

**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-133a & AA-133b [11-05-IOT-V (V-133A) & 12-05-IOT-V (V-133B)]

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: Prior to 2005

2. Tank Data

A. Tank Specifications:

1.	Design capacity	42,000	gallons		
2.	True vapor pressure at storage temperature:	4.660	psia @	70.46	°F
3.	Maximum true vapor pressure (as defined in §60.111b)	5.393	psia @	78.73	°F
4.	Reid vapor pressure at storage temperature:	6.18	psia @	70.46	°F
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: _____ 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: 16.1 feet
2. Shell Diameter: 21.5 feet
3. Maximum Liquid Height: 15.1 feet
4. Average Liquid Height: 7.55 feet
5. Working Volume: 42,000 gal
6. Turnovers per year: 11.71
7. Maximum throughput: 11,430 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	0.98	1.52	2.50

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-134 [13-05-ST (V-134)]

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: Prior to 2006

2. Tank Data

A. Tank Specifications:

1.	Design capacity	6,384	gallons		
2.	True vapor pressure at storage temperature:	2.580	psia @	71.83	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	3.294	psia @	81.96	ºF
4.	Reid vapor pressure at storage temperature:	2.580	psia @	71.83	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: 16 feet
B. Shell Diameter: 8.3 feet
C. Working Volume: 6,384 gal
D. Maximum Throughput: 420,000 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	0.68	0.40	1.08

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-135 (14-05-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: Prior to 2005

2. Tank Data

A. Tank Specifications:

1.	Design capacity		gallons		
2.	True vapor pressure at storage temperature:	4.630	psia @	70.10	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	5.407	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-136 [15-05-WST-CV (V-152)]

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: Prior to 2005

2. Tank Data

A. Tank Specifications:

1.	Design capacity	126,000	gallons		
2.	True vapor pressure at storage temperature:	0.368	psia @	70.40	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	0.486	psia @	78.67	ºF
4.	Reid vapor pressure at storage temperature:	0.368	psia @	70.40	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: 24.1 feet
2. Shell Diameter: 29.7 feet
3. Maximum Liquid Height: 23.1 feet
4. Average Liquid Height: 11.55 feet
5. Working Volume: 126,000 gal
6. Turnovers per year: 0.00
7. Maximum throughput: 0.00 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: 0.93 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	0.12	0.12

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-137 & AA-138 [16-05-ST-V (V-154A) & 17-05-ST-V (V-154B)]

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: Prior to 2005

2. Tank Data

A. Tank Specifications:

1.	Design capacity		gallons		
2.	True vapor pressure at storage temperature:	4.659	psia @	70.45	°F
3.	Maximum true vapor pressure (as defined in §60.111b)	5.439	psia @	79.21	°F
4.	Reid vapor pressure at storage temperature:	6.18	psia @	70.45	°F
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: _____ 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: 16,074.56 gal
6. Turnovers per year: 0.29
7. Maximum throughput: 109.5 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

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	0.53	0.54

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-147 [29-09-OST-CV (V-119C)]

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: 2005

2. Tank Data

A. Tank Specifications:

1.	Design capacity	210,000	gallons		
2.	True vapor pressure at storage temperature:	4.626	psia @	70.05	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	5.315	psia @	77.88	ºF
4.	Reid vapor pressure at storage temperature:	6.18	psia @	70.05	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: 19-05-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: 24.1 feet
2. Shell Diameter: 38.6 feet
3. Maximum Liquid Height: 23.1 feet
4. Average Liquid Height: 11.55 feet
5. Working Volume: 210,000 gal
6. Turnovers per year: 189.51
7. Maximum throughput: 912,500 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	77.77*	5.12*	82.89*

**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-148 [30-09-IOT-CV (V-133C)]

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: Prior to 2005

2. Tank Data

A. Tank Specifications:

1.	Design capacity	63,000	gallons		
2.	True vapor pressure at storage temperature:	4.594	psia @	69.66	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	5.279	psia @	77.50	ºF
4.	Reid vapor pressure at storage temperature:	6.18	psia @	69.66	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: _____ 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: 24.1 feet
2. Shell Diameter: 21.5 feet
3. Maximum Liquid Height: 23.1 feet
4. Average Liquid Height: 11.55 feet
5. Working Volume: 63,000 gal
6. Turnovers per year: 11.47
7. Maximum throughput: 17,140 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	1.46	1.57	3.03

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-154 & AA-155 [35a-13-WST-CV (T-154A) & 35b-13-WST-CV (T-154B)]

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: After 2010

2. Tank Data

A. Tank Specifications:

1.	Design capacity	16,800	gallons		
2.	True vapor pressure at storage temperature:	0.356	psia @	69.41	°F
3.	Maximum true vapor pressure (as defined in §60.111b)	0.463	psia @	77.25	°F
4.	Reid vapor pressure at storage temperature:	0.356	psia @	69.41	°F
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: 0.00
7. Maximum throughput: 0.00 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	0.00	0.01	0.01

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-157 [36-13-GST (V-136)]

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: Prior to 2014

2. Tank Data

A. Tank Specifications:

1.	Design capacity	4,200	gallons		
2.	True vapor pressure at storage temperature:	2.574	psia @	71.74	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	3.287	psia @	81.86	ºF
4.	Reid vapor pressure at storage temperature:	2.574	psia @	71.74	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: 15 feet
B. Shell Diameter: 7 feet
C. Working Volume: 4,200 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	0.03	0.27	0.30

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-158 [37-13-CST]*

**It should be noted that this emission point source accounts for approximately 10 organic chemical blend storage tanks for ease of permitting. In addition, the emissions associated with these sources were aggregated and assume a maximum capacity for conservative permitting purposes.*

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: Prior to 2014

2. Tank Data

A. Tank Specifications:

1.	Design capacity	550	gallons		
2.	True vapor pressure at storage temperature:	2.596	psia @	72.08	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	3.313	psia @	82.20	ºF
4.	Reid vapor pressure at storage temperature:	2.596	psia @	72.08	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: 5.9 feet
B. Shell Diameter: 4 feet
C. Working Volume: 550 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	0.05	0.40	0.45

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-159 [38-13-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: Prior to 2014

2. Tank Data

A. Tank Specifications:

1.	Design capacity	2,000	gallons		
2.	True vapor pressure at storage temperature:	2.587	psia @	71.94	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	3.303	psia @	82.07	ºF
4.	Reid vapor pressure at storage temperature:	2.587	psia @	71.94	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: 5.9 feet
B. Shell Diameter: 10 feet
C. Working Volume: 2,000 gal
D. Maximum Throughput: 210,000 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	0.25	0.14	0.39

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-160 [39-13-CST]*

**It should be noted that this emission point source accounts for approximately 5 organic chemical blend storage tanks for ease of permitting. In addition, the emissions associated with these sources were aggregated and assume a maximum capacity for conservative permitting purposes.*

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: Prior to 2014

2. Tank Data

A. Tank Specifications:

1.	Design capacity	800	gallons		
2.	True vapor pressure at storage temperature:	2.581	psia @	71.84	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	3.295	psia @	81.97	ºF
4.	Reid vapor pressure at storage temperature:	2.581	psia @	71.84	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: 8 feet
B. Shell Diameter: 4.2 feet
C. Working Volume: 800 gal
D. Maximum Throughput: 42,000 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	0.41	0.30	0.71

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-161 [42-14-DST]

B. Product(s) Stored: Diesel (assumes Distillate Fuel Oil 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 2015

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

Tank Summary | Section OPGP-E

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-156 [43-14-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: 2014

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: 9,000 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	0.05	0.38	0.43

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-140 (19-05-F)

B. Equipment Description (include the process(es) that the flare controls emissions from):
Control flare to combust emissions from oil storage tanks (EPNs: 5-05-OST-V, 6-05-OST-V, 7-05-OST-V, & 29-09-OST-CV).

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: 940 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
2-05-LH-BS *Heater Treater* 2b-13-HT-BS *Heater Treater* 3-05-LH-BS *Line Heater* 32-13-LH-BS *Line Heater* 33-13-HT-BS *Heater Treater* 34a-13-LH-BS *Line Heater* 34b-13-LH-BS *Line Heater*	11 Miss. Admin. Code Pt. 2, R. 1.3.A.	2005	2005	N/A
2-05-LH-BS *Heater Treater* 2b-13-HT-BS *Heater Treater* 3-05-LH-BS *Line Heater* 32-13-LH-BS *Line Heater* 33-13-HT-BS *Heater Treater* 34a-13-LH-BS *Line Heater* 34b-13-LH-BS *Line Heater*	11 Miss Admin Code Pt. 2, R. 1.3 B.	2005	2005	N/A
2-05-LH-BS *Heater Treater* 2b-13-HT-BS *Heater Treater* 3-05-LH-BS	11 Miss. Admin. Code Pt. 2, R. 1.3. D(1)(b).	2005	2005	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 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
Line Heater 32-13-LH-BS *Line Heater* 33-13-HT-BS *Heater Treater* 34a-13-LH-BS *Line Heater* 34b-13-LH-BS *Line Heater*				
2-05-LH-BS *Heater Treater* 2b-13-HT-BS *Heater Treater* 3-05-LH-BS *Line Heater* 32-13-LH-BS *Line Heater* 33-13-HT-BS *Heater Treater* 34a-13-LH-BS *Line Heater* 34b-13-LH-BS *Line Heater*	11 Miss. Admin. Code Pt. 2, R. 1.3. D(1)(a).	2005	2005	N/A
2-05-LH-BS *Heater Treater* 2b-13-HT-BS *Heater Treater* 3-05-LH-BS *Line Heater* 32-13-LH-BS *Line Heater* 33-13-HT-BS *Heater Treater* 34a-13-LH-BS *Line Heater*	11 Miss. Admin. Code Pt. 2, R.1.4.A(1).	2005	2005	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 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
34b-13-LH-BS *Line Heater*				
19-05-F *Control Flare*	11 Miss. Admin. Code Pt. 2, R.1.4.B(2).	2005	2005	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
2-05-LH-BS *Heater Treater* 2b-13-HT-BS *Heater Treater* 3-05-LH-BS *Line Heater* 32-13-LH-BS *Line Heater* 33-13-HT-BS *Heater Treater* 34a-13-LH-BS *Line Heater* 34b-13-LH-BS *Line Heater*	11 Miss. Admin. Code Pt. 2, R. 1.3.A.	Opacity	40%	N/A
2-05-LH-BS *Heater Treater* 2b-13-HT-BS *Heater Treater* 3-05-LH-BS *Line Heater* 32-13-LH-BS *Line Heater* 33-13-HT-BS *Heater Treater* 34a-13-LH-BS *Line Heater* 34b-13-LH-BS *Line Heater*	11 Miss Admin Code Pt. 2, R. 1.3 B.	Opacity	Equivalent Opacity	N/A

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.

2-05-LH-BS *Heater Treater* 2b-13-HT-BS *Heater Treater* 3-05-LH-BS *Line Heater* 32-13-LH-BS *Line Heater* 33-13-HT-BS *Heater Treater* 34a-13-LH-BS *Line Heater* 34b-13-LH-BS *Line Heater*	11 Miss. Admin. Code Pt. 2, R. 1.3. D(1)(b).	PM	$E = 0.8808*I^{-0.1667}$	N/A
2-05-LH-BS *Heater Treater* 2b-13-HT-BS *Heater Treater* 3-05-LH-BS *Line Heater* 32-13-LH-BS *Line Heater* 33-13-HT-BS *Heater Treater* 34a-13-LH-BS *Line Heater* 34b-13-LH-BS *Line Heater*	11 Miss. Admin. Code Pt. 2, R. 1.3. D(1)(a).	PM	0.6 lb/MMBTU	N/A

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.

2-05-LH-BS *Heater Treater* 2b-13-HT-BS *Heater Treater* 3-05-LH-BS *Line Heater* 32-13-LH-BS *Line Heater* 33-13-HT-BS *Heater Treater* 34a-13-LH-BS *Line Heater* 34b-13-LH-BS *Line Heater*	11 Miss. Admin. Code Pt. 2, R.1.4.A(1).	SO_2	4.8 lbs/MMBTU	N/A
19-05-F *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.

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.

19-05-F *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.

19-05-F *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

This is a sample calculation for EPNs: 2-05-LH-BS & 2b-13-HT-BS.

POINT SOURCE I.D. NUMBER: ***"See Above"***

EMISSION SOURCE DESCRIPTION: ***3.8 MMBTU/Hr Heater Treater-Burner Stack (V-105A/B)***

DATA:

Emission Source:	***External Combustion Burner***
Hours of Operation:	***8760***
Maximum Burner Rating (MMBTU/Hr):	***3.8***
Fuel Gas Heat of Combustion (BTU/scf): ***(based on an actual fuel gas analysis)***	***1007***
Sulfur Concentration of Fuel Gas (ppmv): ***(conservative estimate)***	***7***
Fuel Source:	***Natural Gas***

Max. Hourly Fuel Consumption (SCFH): = burner rating/fuel gas heat of combustion/80% efficiency = ***4,716.98***

Max. Annual Fuel Consumption (MSCF/Yr): = hourly fuel consumption x hours = ***41,320.74***

EMISSION FACTORS:

Unless otherwise noted, emission factors taken from EPA Publication AP-42, "Compilation of Air Pollution Emission Factors" - Natural Gas Combustion (Small Boilers). SO_2 emission factor based on 100% conversion of sulfur compounds in fuel gas, using H_2S fuel composition noted above.

EMISSION CALCULATIONS:

POLLUTANT:	EMISSION FACTOR ($LBS/10^6$ SCF)	CALCULATED EMISSION RATES:	
		Hourly (lb/hr)	Annual (TPY)
Particulate Matter (filterable + condensable)	7.6	0.0358	0.1570
Sulfur Dioxide	1.182	0.0056	0.0244
Nitrogen Oxides	100	0.4717	2.0660
Carbon Monoxide	84	0.3962	1.7355
Methane (excluded from VOC total)	2.3	0.0108	0.0475
VOC	5.5	0.0259	0.1136
TOC	11	0.0519	0.2273
2-Methylnaphthalene (TAP)	0.0000240	0.0000	0.0000
3-Methylchloranthrene (TAP)	0.0000018	0.0000	0.0000
7,12-Dimethylbenz(a)anthrancene (TAP)	0.0000160	0.0000	0.0000
Acenaphthene (TAP)	0.0000018	0.0000	0.0000
Acenaphthylene (TAP)	0.0000018	0.0000	0.0000
Anthracene (TAP)	0.0000024	0.0000	0.0000
Benz(a)anthracene (TAP)	0.0000018	0.0000	0.0000
Benzene (TAP)	0.0021000	0.0000	0.0000
Benzo(a)pyrene (TAP)	0.0000012	0.0000	0.0000

POLLUTANT:	EMISSION FACTOR (LBS/10^6 SCF)	CALCULATED EMISSION RATES:	
		Hourly (lb/hr)	Annual (TPY)
Benzo(b)fluoranthene (TAP)	0.0000018	0.0000	0.0000
Benzo(g,h,I)perylene (TAP)	0.0000012	0.0000	0.0000
Benzo(k)fluoranthene (TAP)	0.0000018	0.0000	0.0000
Chrysene (TAP)	0.0000018	0.0000	0.0000
Dibenzo(a,h)anthrancene (TAP)	0.0000012	0.0000	0.0000
Dichlorobenzene (TAP)	0.0012000	0.0000	0.0000
Fluorathene (TAP)	0.0000030	0.0000	0.0000
Fluorene (TAP)	0.0000028	0.0000	0.0000
Formaldehyde (TAP)	0.0750000	0.0004	0.0015
Hexane (TAP)	1.8000000	0.0085	0.0372
Indeno(1,2,3-cd)pyrene (TAP)	0.0000018	0.0000	0.0000
Naphthalene (TAP)	0.0006100	0.0000	0.0000
Phenanathrene (TAP)	0.0000170	0.0000	0.0000
Pyrene (TAP)	0.0000050	0.0000	0.0000
Toluene (TAP)	0.0034000	0.0000	0.0001
Arsenic (TAP)	0.0002000	0.0000	0.0000
Beryllium (TAP)	0.0000120	0.0000	0.0000
Cadmium (TAP)	0.0011000	0.0000	0.0000
Chromium (TAP)	0.0014000	0.0000	0.0000
Cobalt (TAP)	0.0000840	0.0000	0.0000
Manganese (TAP)	0.0003800	0.0000	0.0000
Mercury (TAP)	0.0002600	0.0000	0.0000
Nickel (TAP)	0.0021000	0.0000	0.0000
Selenium (TAP)	0.0000240	0.0000	0.0000
Total TAPs		0.01	0.04
Total VOC-TAPs		0.01	0.04
Total Non VOC & Non TAP-HC		0.01	0.05
Total VOC		**0.03**	**0.11**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***3-05-LH-BS***

EMISSION SOURCE DESCRIPTION: ***9 MMBTU/Hr Line Heater-Burner Stack (H-106)***

DATA:

Emission Source:	***External Combustion Burner***
Hours of Operation:	***8760***
Maximum Burner Rating (MMBTU/Hr):	***9.0***
Fuel Gas Heat of Combustion (BTU/scf): *(based on an actual fuel gas analysis)*	***1007***
Sulfur Concentration of Fuel Gas (ppmv): *(conservative estimate)*	***7***
Fuel Source:	***Natural Gas***

Max. Hourly Fuel Consumption (SCFH): = burner rating/fuel gas heat of combustion/80% efficiency = ***11,171.80***

Max. Annual Fuel Consumption (MSCF/Yr): = hourly fuel consumption x hours = ***97,864.97***

EMISSION FACTORS:

Unless otherwise noted, emission factors taken from EPA Publication AP-42, "Compilation of Air Pollution Emission Factors" - Natural Gas Combustion (Small Boilers). SO_2 emission factor based on 100% conversion of sulfur compounds in fuel gas, using H_2S fuel composition noted above.

EMISSION CALCULATIONS:

POLLUTANT:	EMISSION FACTOR ($LBS/10^6$ SCF)	CALCULATED EMISSION RATES:	
		Hourly (lb/hr)	Annual (TPY)
Particulate Matter (filterable + condensable)	7.6	0.0849	0.3719
Sulfur Dioxide	1.182	0.0132	0.0578
Nitrogen Oxides	100	1.1172	4.8932
Carbon Monoxide	84	0.9384	4.1103
Methane (excluded from VOC total)	2.3	0.0257	0.1125
VOC	5.5	0.0614	0.2691
TOC	11	0.1229	0.5383
2-Methylnaphthalene (TAP)	0.0000240	0.0000	0.0000
3-Methylchloranthrene (TAP)	0.0000018	0.0000	0.0000
7,12-Dimethylbenz(a)anthrancene (TAP)	0.0000160	0.0000	0.0000
Acenaphthene (TAP)	0.0000018	0.0000	0.0000
Acenaphthylene (TAP)	0.0000018	0.0000	0.0000
Anthracene (TAP)	0.0000024	0.0000	0.0000
Benz(a)anthracene (TAP)	0.0000018	0.0000	0.0000
Benzene (TAP)	0.0021000	0.0000	0.0001
Benzo(a)pyrene (TAP)	0.0000012	0.0000	0.0000
Benzo(b)fluoranthene (TAP)	0.0000018	0.0000	0.0000

POLLUTANT:	EMISSION FACTOR ($LBS/10^6$ SCF)	CALCULATED EMISSION RATES:	
		Hourly (lb/hr)	Annual (TPY)
Benzo(g,h,I)perylene (TAP)	0.0000012	0.0000	0.0000
Benzo(k)fluoranthene (TAP)	0.0000018	0.0000	0.0000
Chrysene (TAP)	0.0000018	0.0000	0.0000
Dibenzo(a,h)anthrancene (TAP)	0.0000012	0.0000	0.0000
Dichlorobenzene (TAP)	0.0012000	0.0000	0.0001
Fluorathene (TAP)	0.0000030	0.0000	0.0000
Fluorene (TAP)	0.0000028	0.0000	0.0000
Formaldehyde (TAP)	0.0750000	0.0008	0.0037
Hexane (TAP)	1.8000000	0.0201	0.0881
Indeno(1,2,3-cd)pyrene (TAP)	0.0000018	0.0000	0.0000
Naphthalene (TAP)	0.0006100	0.0000	0.0000
Phenanathrene (TAP)	0.0000170	0.0000	0.0000
Pyrene (TAP)	0.0000050	0.0000	0.0000
Toluene (TAP)	0.0034000	0.0000	0.0002
Arsenic (TAP)	0.0002000	0.0000	0.0000
Beryllium (TAP)	0.0000120	0.0000	0.0000
Cadmium (TAP)	0.0011000	0.0000	0.0001
Chromium (TAP)	0.0014000	0.0000	0.0001
Cobalt (TAP)	0.0000840	0.0000	0.0000
Manganese (TAP)	0.0003800	0.0000	0.0000
Mercury (TAP)	0.0002600	0.0000	0.0000
Nickel (TAP)	0.0021000	0.0000	0.0001
Selenium (TAP)	0.0000240	0.0000	0.0000
Total TAPs		0.02	0.09
Total VOC-TAPs		0.02	0.09
Total Non VOC & Non TAP-HC		0.03	0.11
Total VOC		**0.06**	**0.27**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***4-05-SBP***

EMISSION SOURCE DESCRIPTION: ***Sand Blowdown Pit (SP-120)***

DATA:

Emission Source:	***Flash Gas from Brine Solution****
Max. Pressure Drop of Brine Solution: (psig)	***1000***
Approx. Temperature of Brine Solution: (^{o}F)	***80***
Flash Gas Specific Gravity: ***(based on an actual brine flash analysis)***	***1.5249***
Avg. Water Throughput: (BBL/Hr)	***50***
Max. Water Throughput: (BBL/Hr)	***50***
Blowdown Hours:	***730***
Gas to Water Ratio: (SCF/BBL of Brine; GWR)	***23.48***
Basis of Emission Estimates:	***API Documentation & Actual Brine Flash Analysis***

**Associated with vessel blowdowns*

Avg. Hourly Uncontrolled Flash Rate (SCF/Hr)	=	Brine Rate * GWR	=	**1174.00**
Avg. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Flash Gas Gravity * Density of Air * Flash Rate	=	**136.77**
Max. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Hourly * Ratio of Max. Water Rate to Avg. Water Rate	=	**136.77**
Annual Potential Uncontrolled Flash Emissions (TPY)	=	Hourly * Blowdown Hours/2000	=	**49.92**

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 brine flash analysis; refer to Southern Petroleum Laboratories Report No.: 13110659-001A 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)	0.234	0.3201	0.3201	0.1168
Carbon Dioxide (excluded from VOC total)	99.543	136.1487	136.1487	49.6929
Methane (excluded from VOC total)	0.052	0.0711	0.0711	0.0260
Ethane (excluded from VOC total)	0.009	0.0123	0.0123	0.0045
Hydrogen Sulfide (excluded from VOC total)	0.000	0.0000	0.0000	0.0000
Propane	0.009	0.0123	0.0123	0.0045
Iso-Butane	0.002	0.0027	0.0027	0.0010
N-Butane	0.006	0.0082	0.0082	0.0030
Iso-Pentane	0.002	0.0027	0.0027	0.0010

N-Pentane	0.002	0.0027	0.0027	0.0010
Iso-Hexane	0.002	0.0027	0.0027	0.0010
N-Hexane (TAP)	0.002	0.0027	0.0027	0.0010
Methylcyclopentane	0.000	0.0000	0.0000	0.0000
Benzene (TAP)	0.057	0.0780	0.0780	0.0285
Cyclohexane	0.002	0.0027	0.0027	0.0010
Heptanes	0.006	0.0082	0.0082	0.0030
Methylcyclohexane	0.000	0.0000	0.0000	0.0000
Toluene (TAP)	0.028	0.0383	0.0383	0.0140
2,2,4-Trimethylpentane (TAP)	0.006	0.0082	0.0082	0.0030
Octanes	0.002	0.0027	0.0027	0.0010
Ethylbenzene (TAP)	0.001	0.0014	0.0014	0.0005
Xylenes (TAP)	0.008	0.0109	0.0109	0.0040
Nonanes	0.007	0.0096	0.0096	0.0035
Decanes Plus	0.020	0.0274	0.0274	0.0100
Total Weight Percent:	100.000			
Total TAP Emissions		0.14	0.14	0.05
Total VOC Emissions		**0.22**	**0.22**	**0.08**
Total Non VOC & Non TAP-HC		0.08	0.08	0.03
Total Emissions		136.77	136.77	49.92

VOC Emission Total (TPY)	=	Brine Flash	=	**0.08**

Emission Calculations

Emission calculations shown below are presented for informational purposes only as vapors from the wet oil tank are routed to the control flare (EPN: 19-05-F) for combustion, except during brief intervals when thief hatches are opened for purposes of sampling, gauging, etc.

POINT SOURCE I.D. NUMBER: ***5-05-OST-V***

EMISSION SOURCE DESCRIPTION: ***3000 BBL Wet Oil Tank-Vent (V-118A)***

DATA:

Emission Source:	***Crude Oil Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD - Q_{avg})**	***100***
Maximum Daily Oil Throughput: **(BBLD - Q_{max})**	***200***
Average VOC Working Losses - L_w (lb/yr):	***6,205.520***
Average VOC Standing Losses - L_S (lb/yr):	***6,033.096***
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	=	**1.58**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**2.39**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**6.94**

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; 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)	0.00	0.0000	0.0000	0.0000
Methane (excluded from VOC total)	6.20	0.0982	0.1480	0.4302
Ethane (excluded from VOC total)	5.60	0.0887	0.1337	0.3886
Propane	17.60	0.2788	0.4202	1.2213
Iso-Butane	1.50	0.0238	0.0358	0.1041
N-Butane	27.10	0.4293	0.6470	1.8805
Iso-Pentane	1.50	0.0238	0.0358	0.1041
N-Pentane	14.60	0.2313	0.3486	1.0131
Heptane	9.20	0.1458	0.2197	0.6384
Octane	6.90	0.1093	0.1647	0.4788
Other NM/NE Hydrocarbons	1.80	0.0285	0.0430	0.1249

N-Hexane (TAP)	7.90	0.1252	0.1886	0.5482
Benzene (TAP)	0.10	0.0016	0.0024	0.0069
Total TAP Emissions		0.13	0.19	0.56
Total VOC Emissions		**1.40**	**2.11**	**6.12**
Total Non VOC & Non TAP-HC		0.19	0.28	0.82
Total Hydrocarbon Emissions		1.58	2.39	6.94

Uncontrolled VOC Emission Total (TPY)	Storage Vapors	=	**6.12**

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***
Number of Tanks in Vent System:	***2***
Max. Minutes a Hatch is Opened in a Single Hour:	***5***
Maximum Hourly Emission Rate (lb/hr): **(from preceding tank emission estimates)**	***0.20***

Avg. Hourly Emissions (lb/hr)	=	Annual Total/8760 (hrs/yr)	=	**0.00**
Maximum Hourly Emissions (lb/hr)	=	Max. Emission Rate * Max. Minutes/Hr Hatch is Open	=	**0.20**
Maximum Annual Emissions (TPY)	=	Max. Hourly THC Rate * Hours/Yr Hatch is Open	=	**0.02**

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

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Methane (excluded from VOC total)	6.20	0.000	0.012	0.001
Ethane (excluded from VOC total)	5.60	0.000	0.011	0.001
Hydrogen Sulfide (excluded from VOC total)	0.00	0.000	0.000	0.000
Propane	17.60	0.001	0.035	0.003
Iso-Butane	1.50	0.000	0.003	0.000
N-Butane	27.10	0.001	0.054	0.005
Iso-Pentane	1.50	0.000	0.003	0.000
N-Pentane	14.60	0.001	0.029	0.003
N-Hexane (TAP)	7.90	0.000	0.016	0.001
Benzene (TAP)	0.10	0.000	0.000	0.000
Heptanes	9.20	0.000	0.018	0.002

Octanes	6.90	0.000	0.014	0.001
Other NM/NE HC	1.80	0.000	0.004	0.000
Total Weight Percent:	100.00			
Total TAP Emissions		0.00	0.02	0.00
Total VOC Emissions		**0.00**	**0.18**	**0.02**
Total Non VOC & Non TAP-HC		0.00	0.02	0.00
Total Emissions		0.00	0.20	0.02

Emission Calculations

Emission calculations shown below are presented for informational purposes only as vapors from the wet/dry oil tank are routed to the control flare (EPN: 19-05-F) for combustion, except during brief intervals when thief hatches are opened for purposes of sampling, gauging, etc.

POINT SOURCE I.D. NUMBER: ***6-05-OST-V***

EMISSION SOURCE DESCRIPTION: ***3000 BBL Wet/Dry Oil Tank-Vent (V-119A)***

DATA:

Emission Source:	***Crude Oil Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD - Q_{avg})**	***1500***
Maximum Daily Oil Throughput: **(BBLD - Q_{max})**	***4000***
Average VOC Working Losses - L_w (lb/yr):	***93,082.802***
Average VOC Standing Losses - Ls (lb/yr):	***6,033.096***
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	=	**12.83**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**32.91**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**56.20**

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; 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)	0.00	0.0000	0.0000	0.0000
Methane (excluded from VOC total)	6.20	0.7955	2.0406	3.4843
Ethane (excluded from VOC total)	5.60	0.7185	1.8432	3.1471
Propane	17.60	2.2582	5.7928	9.8910
Iso-Butane	1.50	0.1925	0.4937	0.8430
N-Butane	27.10	3.4771	8.9196	15.2299
Iso-Pentane	1.50	0.1925	0.4937	0.8430
N-Pentane	14.60	1.8733	4.8054	8.2050
Heptane	9.20	1.1804	3.0281	5.1703
Octane	6.90	0.8853	2.2710	3.8777
Other NM/NE Hydrocarbons	1.80	0.2310	0.5924	1.0116

N-Hexane (TAP)	7.90	1.0136	2.6002	4.4397
Benzene (TAP)	0.10	0.0128	0.0329	0.0562
Total TAP Emissions		1.03	2.63	4.50
Total VOC Emissions		**11.32**	**29.03**	**49.57**
Total Non VOC & Non TAP-HC		1.51	3.88	6.63
Total Hydrocarbon Emissions		12.83	32.91	56.20

DATA:

Emission Source:	***Flash Gas from Oil***
Flash Gas Specific Gravity:	***1.554***
Average Oil Throughput: **(BBLD)**	***1500***
Maximum Oil Throughput: **(BBLD)**	***4000***
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; refer to Southern Petroleum Laboratories Report No.: 23080185-005A 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:			
40.86	55	80	
	0	60	23.20
		Prorated GOR Estimate:	**23.20**

Avg. Hourly Uncontrolled Flash Rate (SCF/Hr)	=	Oil Rate * GOR	=	**1450.00**
Avg. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Flash Gas Gravity * Density of Air * Flash Rate	=	**172.15**
Max. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Avg. Emissions * Ratio of Max. Oil Rate to Avg. Oil Rate	=	**459.07**
Annual Potential Uncontrolled Flash Emissions (TPY)	=	Hourly * 8760/2000	=	**754.02**

SPECIATION FACTORS:

Speciation of the flash gas mixture taken from the referenced laboratory results; refer to Southern Petroleum Laboratories Report No.: 23080185-005A 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)	1.970	3.3914	9.0437	14.8541
Carbon Dioxide (excluded from VOC total)	83.435	143.6351	383.0270	629.1141
Methane (excluded from VOC total)	0.324	0.5578	1.4874	2.4430
Ethane (excluded from VOC total)	0.788	1.3566	3.6175	5.9417
Hydrogen Sulfide (excluded from VOC total)	0.000	0.0000	0.0000	0.0000
Propane	2.932	5.0475	13.4600	22.1078
Iso-Butane	1.475	2.5392	6.7713	11.1218
N-Butane	3.626	6.2422	16.6460	27.3407
Iso-Pentane	1.861	3.2038	8.5433	14.0323
N-Pentane	1.464	2.5203	6.7208	11.0388
Iso-Hexane	0.621	1.0691	2.8508	4.6824
N-Hexane (TAP)	0.646	1.1121	2.9656	4.8709
Methylcyclopentane	0.144	0.2479	0.6611	1.0858
Benzene (TAP)	0.077	0.1326	0.3535	0.5806
Cyclohexane	0.209	0.3598	0.9595	1.5759
Heptanes	0.217	0.3736	0.9962	1.6362
Methylcyclohexane	0.037	0.0637	0.1699	0.2790
Toluene (TAP)	0.008	0.0138	0.0367	0.0603
2,2,4-Trimethylpentane (TAP)	0.000	0.0000	0.0000	0.0000
Octanes	0.061	0.1050	0.2800	0.4600
Ethylbenzene (TAP)	0.002	0.0034	0.0092	0.0151
Xylenes (TAP)	0.012	0.0207	0.0551	0.0905
Nonanes	0.055	0.0947	0.2525	0.4147
Decanes Plus	0.036	0.0620	0.1653	0.2714
Total Weight Percent:	100.000			
Total TAP Emissions		1.28	3.42	5.62
Total VOC Emissions		**23.21**	**61.90**	**101.66**
Total Non VOC & Non TAP-HC		1.91	5.10	8.38
Total Emissions		172.15	459.07	754.02

Uncontrolled VOC Emission Total (TPY)	Storage Vapors + Oil Flash	=	**151.23**

DATA:

Emission Source:	***Losses When Opening Thief Hatches***
Specific Gravity of Gas:	***1.554***
Maximum Thief Hatch Venting (Hrs/Yr) **(Under Normal/Routine Operating Conditions)**	***30***
Number of Tanks in Vent System:	***2***
Max. Minutes a Hatch is Opened in a Single Hour:	***5***
Maximum Hourly Emission Rate (lb/hr): **(from preceding tank emission estimates)**	***41.00***

Avg. Hourly Emissions (lb/hr)	=	Annual Total/8760 (hrs/yr)	=	**0.85**
Maximum Hourly Emissions (lb/hr)	=	Max. Emission Rate * Max. Minutes/Hr Hatch is Open	=	**41.00**
Maximum Annual Emissions (TPY)	=	Max. Hourly THC Rate * Hours/Yr Hatch is Open	=	**3.74**

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)	1.970	0.017	0.808	0.074
Carbon Dioxide (excluded from VOC total)	83.435	0.712	34.208	3.121
Methane (excluded from VOC total)	0.324	0.003	0.133	0.012
Ethane (excluded from VOC total)	0.788	0.007	0.323	0.029
Hydrogen Sulfide (excluded from VOC total)	0.000	0.000	0.000	0.000
Propane	2.932	0.025	1.202	0.110
Iso-Butane	1.475	0.013	0.605	0.055
N-Butane	3.626	0.031	1.487	0.136
Iso-Pentane	1.861	0.016	0.763	0.070
N-Pentane	1.464	0.013	0.600	0.055
Iso-Hexane	0.621	0.005	0.255	0.023
N-Hexane (TAP)	0.646	0.006	0.265	0.024
Methylcyclopentane	0.144	0.001	0.059	0.005
Benzene (TAP)	0.077	0.001	0.032	0.003
Cyclohexane	0.209	0.002	0.086	0.008
Heptanes	0.217	0.002	0.089	0.008
Methylcyclohexane	0.037	0.000	0.015	0.001
Toluene (TAP)	0.008	0.000	0.003	0.000
2,2,4-Trimethylpentane (TAP)	0.000	0.000	0.000	0.000
Octanes	0.061	0.001	0.025	0.002
Ethylbenzene (TAP)	0.002	0.000	0.001	0.000
Xylenes (TAP)	0.012	0.000	0.005	0.000
Nonanes	0.055	0.000	0.023	0.002

Decanes Plus	0.036	0.000	0.015	0.001
Other NM/NE HC	0.000	0.000	0.000	0.000
Total Weight Percent:	100.000			
Total TAP Emissions		0.01	0.31	0.03
Total VOC Emissions		**0.12**	**5.53**	**0.50**
Total Non VOC & Non TAP-HC		0.01	0.46	0.04
Total Emissions		0.85	41.00	3.74

Emission Calculations

Emission calculations shown below are presented for informational purposes only as vapors from the dry oil tank are routed to the control flare (EPN: 19-05-F) for combustion, except during brief intervals when thief hatches are opened for purposes of sampling, gauging, etc.

POINT SOURCE I.D. NUMBER: ***7-05-OST-V***

EMISSION SOURCE DESCRIPTION: ***5000 BBL Dry Oil Tank-Vent (V-119B)***

DATA:

Emission Source:	***Crude Oil Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD - Q_{avg})**	***100***
Maximum Daily Oil Throughput: **(BBLD - Q_{max})**	***200***
Average VOC Working Losses - L_w (lb/yr):	***6,220.795***
Average VOC Standing Losses - Ls (lb/yr):	***10,235.727***
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	=	**2.13**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**2.94**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**9.33**

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; 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)	0.00	0.0000	0.0000	0.0000
Methane (excluded from VOC total)	6.20	0.1321	0.1820	0.5785
Ethane (excluded from VOC total)	5.60	0.1193	0.1644	0.5225
Propane	17.60	0.3749	0.5167	1.6422
Iso-Butane	1.50	0.0320	0.0440	0.1400
N-Butane	27.10	0.5773	0.7956	2.5287
Iso-Pentane	1.50	0.0320	0.0440	0.1400
N-Pentane	14.60	0.3110	0.4286	1.3623
Heptane	9.20	0.1960	0.2701	0.8584
Octane	6.90	0.1470	0.2026	0.6438
Other NM/NE Hydrocarbons	1.80	0.0383	0.0528	0.1680

N-Hexane (TAP)	7.90	0.1683	0.2319	0.7371
Benzene (TAP)	0.10	0.0021	0.0029	0.0093
Total TAP Emissions		0.17	0.23	0.75
Total VOC Emissions		**1.88**	**2.59**	**8.23**
Total Non VOC & Non TAP-HC		0.25	0.35	1.10
Total Hydrocarbon Emissions		2.13	2.94	9.33

Uncontrolled VOC Emission Total (TPY)	Storage Vapors	=	**8.23**

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***
Number of Tanks in Vent System:	***2***
Max. Minutes a Hatch is Opened in a Single Hour:	***5***
Maximum Hourly Emission Rate (lb/hr): **(from preceding tank emission estimates)**	***0.25***

Avg. Hourly Emissions (lb/hr)	=	Annual Total/8760 (hrs/yr)	=	**0.00**
Maximum Hourly Emissions (lb/hr)	=	Max. Emission Rate * Max. Minutes/Hr Hatch is Open	=	**0.25**
Maximum Annual Emissions (TPY)	=	Max. Hourly THC Rate * Hours/Yr Hatch is Open	=	**0.02**

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

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Methane (excluded from VOC total)	6.20	0.000	0.016	0.001
Ethane (excluded from VOC total)	5.60	0.000	0.014	0.001
Hydrogen Sulfide (excluded from VOC total)	0.00	0.000	0.000	0.000
Propane	17.60	0.001	0.044	0.004
Iso-Butane	1.50	0.000	0.004	0.000
N-Butane	27.10	0.001	0.068	0.006
Iso-Pentane	1.50	0.000	0.004	0.000
N-Pentane	14.60	0.001	0.037	0.003
N-Hexane (TAP)	7.90	0.000	0.020	0.002
Benzene (TAP)	0.10	0.000	0.000	0.000
Heptanes	9.20	0.000	0.023	0.002

Octanes	6.90	0.000	0.017	0.002
Other NM/NE HC	1.80	0.000	0.005	0.000
Total Weight Percent:	100.00			
Total TAP Emissions		0.00	0.02	0.00
Total VOC Emissions		**0.00**	**0.22**	**0.02**
Total Non VOC & Non TAP-HC		0.00	0.03	0.00
Total Emissions		0.00	0.25	0.02

Emission Calculations

This is a sample calculation for EPNs: 8a-05-GBT-CV & 8b-05-GBT-CV.

POINT SOURCE I.D. NUMBERS: ***"See Above"***

EMISSION SOURCE DESCRIPTION: ***1500 BBL Water Storage Tank-Common Vent (V-120A/B)***

DATA:

Emission Source:	***Crude Oil/Water Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD/Tank - Q_{avg})**	***3.75***
Maximum Daily Oil Throughput: **(BBLD/Tank - Q_{max})**	***7.50***
Average Daily Water Throughput: **(Annual Average; BBLD/Tank - Q_{avg})**	***3750***
Maximum Daily Water Throughput: **(BBLD/Tank - Q_{max})**	***7500***
Average VOC Working Losses - L_w (lb/yr):	***6,764.684***
Average VOC Standing Losses - Ls (lb/yr):	***116.209***
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	=	**0.89**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**1.77**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**3.90**

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; 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)	0.00	0.0000	0.0000	0.0000
Methane (excluded from VOC total)	6.20	0.0552	0.1095	0.2419
Ethane (excluded from VOC total)	5.60	0.0499	0.0989	0.2185
Propane	17.60	0.1568	0.3109	0.6867
Iso-Butane	1.50	0.0134	0.0265	0.0585
N-Butane	27.10	0.2414	0.4787	1.0573
Iso-Pentane	1.50	0.0134	0.0265	0.0585
N-Pentane	14.60	0.1300	0.2579	0.5696
Heptane	9.20	0.0819	0.1625	0.3589
Octane	6.90	0.0615	0.1219	0.2692

Other NM/NE Hydrocarbons	1.80	0.0160	0.0318	0.0702
N-Hexane (TAP)	7.90	0.0704	0.1395	0.3082
Benzene (TAP)	0.10	0.0009	0.0018	0.0039
Total Weight Percent:	100.00			
Total TAP Emissions		0.07	0.14	0.31
Total VOC Emissions		**0.79**	**1.56**	**3.44**
Total Non VOC & Non TAP-HC		0.11	0.21	0.46
Total Hydrocarbon Emissions		0.89	1.77	3.90

DATA:

Emission Source:	***Flash Gas from Brine Solution***
Approx. Pressure Drop of Brine Solution: (psig)	***25***
Approx. Temperature of Brine Solution: (ºF)	***80***
Flash Gas Specific Gravity: ***(based on an actual brine flash analysis)***	***1.5249***
Avg. Water Throughput: (BBLD/Tank)	***3,750***
Max. Water Throughput: (BBLD/Tank)	***7,500***
Gas to Water Ratio: (SCF/BBL of Water; GWR)	***23.48***
Basis of Emission Estimates:	***API Documentation & Actual Brine Flash Analysis***

Avg. Hourly Uncontrolled Flash Rate (SCF/Hr)	=	Brine Rate * GWR	=	**3668.75**
Avg. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Flash Gas Gravity * Density of Air * Flash Rate	=	**427.42**
Max. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Hourly * Ratio of Max. Water Rate to Avg. Water Rate	=	**854.84**
Annual Potential Uncontrolled Flash Emissions (TPY)	=	Hourly * 8760/2000	=	**1872.10**

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 brine flash analysis; refer to Southern Petroleum Laboratories Report No.: 13110659-001A 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)	0.234	1.0002	2.0003	4.3807
Carbon Dioxide (excluded from VOC total)	99.543	425.4647	850.9295	1863.5441
Methane (excluded from VOC total)	0.052	0.2223	0.4445	0.9735
Ethane (excluded from VOC total)	0.009	0.0385	0.0769	0.1685
Hydrogen Sulfide (excluded from VOC total)	0.000	0.0000	0.0000	0.0000
Propane	0.009	0.0385	0.0769	0.1685
Iso-Butane	0.002	0.0085	0.0171	0.0374
N-Butane	0.006	0.0256	0.0513	0.1123

Iso-Pentane	0.002	0.0085	0.0171	0.0374
N-Pentane	0.002	0.0085	0.0171	0.0374
Iso-Hexane	0.002	0.0085	0.0171	0.0374
N-Hexane (TAP)	0.002	0.0085	0.0171	0.0374
Methylcyclopentane	0.000	0.0000	0.0000	0.0000
Benzene (TAP)	0.057	0.2436	0.4873	1.0671
Cyclohexane	0.002	0.0085	0.0171	0.0374
Heptanes	0.006	0.0256	0.0513	0.1123
Methylcyclohexane	0.000	0.0000	0.0000	0.0000
Toluene (TAP)	0.028	0.1197	0.2394	0.5242
2,2,4-Trimethylpentane (TAP)	0.006	0.0256	0.0513	0.1123
Octanes	0.002	0.0085	0.0171	0.0374
Ethylbenzene (TAP)	0.001	0.0043	0.0085	0.0187
Xylenes (TAP)	0.008	0.0342	0.0684	0.1498
Nonanes	0.007	0.0299	0.0598	0.1310
Decanes Plus	0.020	0.0855	0.1710	0.3744
Total Weight Percent:	100.000			
Total TAP Emissions		0.44	0.87	1.91
Total VOC Emissions		**0.69**	**1.38**	**3.03**
Total Non VOC & Non TAP-HC		0.26	0.52	1.14
Total Emissions		427.42	854.84	1872.10

DATA:

Emission Source:	***Flash Gas from Oil***
Flash Gas Specific Gravity:	***1.554***
Average Oil Throughput: **(BBLD/Tank)**	***3.75***
Maximum Oil Throughput: **(BBLD/Tank)**	***7.50***
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; refer to Southern Petroleum Laboratories Report No.: 23080185-005A 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 Conditions:			
40.86	25	80	
	0	60	Unknown
Laboratory Conditions:			
40.86	55	80	
	0	60	23.20
		Prorated GOR Estimate:	**10.55**

Avg. Hourly Uncontrolled Flash Rate (SCF/Hr)	=	Oil Rate * GOR	=	**1.65**
Avg. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Flash Gas Gravity * Density of Air * Flash Rate	=	**0.20**
Max. Hourly Controlled Total Flash Emissions (lb/hr)	=	Avg. Emissions * Ratio of Max. Oil Rate to Avg. Oil Rate	=	**0.39**
Annual Potential Uncontrolled Flash Emissions (TPY)	=	Hourly * 8760/2000	=	**0.88**

SPECIATION FACTORS:

Speciation of the flash gas mixture taken from the referenced laboratory results; refer to Southern Petroleum Laboratories Report No.: 23080185-005A 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)	1.970	0.0039	0.0077	0.0173
Carbon Dioxide (excluded from VOC total)	83.435	0.1634	0.3269	0.7309
Methane (excluded from VOC total)	0.324	0.0006	0.0013	0.0028
Ethane (excluded from VOC total)	0.788	0.0015	0.0031	0.0069
Hydrogen Sulfide (excluded from VOC total)	0.000	0.0000	0.0000	0.0000
Propane	2.932	0.0057	0.0115	0.0257
Iso-Butane	1.475	0.0029	0.0058	0.0129
N-Butane	3.626	0.0071	0.0142	0.0318
Iso-Pentane	1.861	0.0036	0.0073	0.0163
N-Pentane	1.464	0.0029	0.0057	0.0128
Iso-Hexane	0.621	0.0012	0.0024	0.0054
N-Hexane (TAP)	0.646	0.0013	0.0025	0.0057
Methylcyclopentane	0.144	0.0003	0.0006	0.0013
Benzene (TAP)	0.077	0.0002	0.0003	0.0007
Cyclohexane	0.209	0.0004	0.0008	0.0018
Heptanes	0.217	0.0004	0.0009	0.0019
Methylcyclohexane	0.037	0.0001	0.0001	0.0003
Toluene (TAP)	0.008	0.0000	0.0000	0.0001
2,2,4-Trimethylpentane (TAP)	0.000	0.0000	0.0000	0.0000
Octanes	0.061	0.0001	0.0002	0.0005
Ethylbenzene (TAP)	0.002	0.0000	0.0000	0.0000
Xylenes (TAP)	0.012	0.0000	0.0000	0.0001
Nonanes	0.055	0.0001	0.0002	0.0005
Decanes Plus	0.036	0.0001	0.0001	0.0003
Total Weight Percent:	100.000			
Total TAP Emissions		0.00	0.00	0.01
Total VOC Emissions		**0.03**	**0.05**	**0.12**
Total Non VOC & Non TAP-HC		0.00	0.00	0.01
Total Emissions		0.20	0.39	0.88

VOC Emission Total (TPY)	=	Storage Vapors + Brine Flash + Oil Flash	=	**6.59**

Emission Calculations

This is a sample calculation for EPNs: 9a-05-WST-CV & 9b-05-WST-CV.

POINT SOURCE I.D. NUMBERS: ***"See Above"***

EMISSION SOURCE DESCRIPTION: ***2000 BBL Produced Water Tank-Vent (V-129A/B)***

DATA:

Emission Source:	***Water Storage Vapors ('Working' & 'Standing')***
Average Daily Water Throughput: **(Annual Average; BBLD/Tank - Qavg)**	***0***
Maximum Daily Water Throughput: **(BBLD/Tank - Q_{max})**	***0***
Average VOC Working Losses - L_W (lb/yr):	***0.000***
Average VOC Standing Losses - Ls (lb/yr):	***161.985***
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	=	**0.02**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**0.02**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**0.09**

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; 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)	0.00	0.0000	0.0000	0.0000
Methane (excluded from VOC total)	6.20	0.0013	0.0013	0.0057
Ethane (excluded from VOC total)	5.60	0.0012	0.0012	0.0051
Propane	17.60	0.0037	0.0037	0.0162
Iso-Butane	1.50	0.0003	0.0003	0.0014
N-Butane	27.10	0.0057	0.0057	0.0249
Iso-Pentane	1.50	0.0003	0.0003	0.0014
N-Pentane	14.60	0.0031	0.0031	0.0134
Heptane	9.20	0.0019	0.0019	0.0085
Octane	6.90	0.0014	0.0014	0.0063
Other NM/NE Hydrocarbons	1.80	0.0004	0.0004	0.0017

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
N-Hexane (TAP)	7.90	0.0017	0.0017	0.0073
Benzene (TAP)	0.10	0.0000	0.0000	0.0001
Total Weight Percent:	100.00			
Total TAP Emissions		0.00	0.00	0.01
Total VOC Emissions		**0.02**	**0.02**	**0.08**
Total Non VOC & Non TAP-HC		0.00	0.00	0.01
Total Hydrocarbon Emissions		0.02	0.02	0.09

VOC Emission Total (TPY)	=	Storage Vapors	=	**0.08**

Emission Calculations

POINT SOURCE I.D. NUMBER: *9c-09-WST-CV*

EMISSION SOURCE DESCRIPTION: *4500 BBL Produced Water Tank-Common Vent (V-129C)*

DATA:

Emission Source:	***Water Storage Vapors ('Working' & 'Standing')***
Average Daily Water Throughput: **(Annual Average; BBLD - Qavg)**	***0***
Maximum Daily Water Throughput: **(BBLD - Q_{max})**	***0***
Average VOC Working Losses - L_W (lb/yr):	***0.000***
Average VOC Standing Losses - L_S (lb/yr):	***217.064***
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; 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)	0.00	0.0000	0.0000	0.0000
Methane (excluded from VOC total)	6.20	0.0017	0.0017	0.0076
Ethane (excluded from VOC total)	5.60	0.0016	0.0016	0.0069
Propane	17.60	0.0049	0.0049	0.0217
Iso-Butane	1.50	0.0004	0.0004	0.0018
N-Butane	27.10	0.0076	0.0076	0.0334
Iso-Pentane	1.50	0.0004	0.0004	0.0018
N-Pentane	14.60	0.0041	0.0041	0.0180
Heptane	9.20	0.0026	0.0026	0.0113
Octane	6.90	0.0019	0.0019	0.0085
Other NM/NE Hydrocarbons	1.80	0.0005	0.0005	0.0022

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
N-Hexane (TAP)	7.90	0.0022	0.0022	0.0097
Benzene (TAP)	0.10	0.0000	0.0000	0.0001
Total Weight Percent:	100.00			
Total TAP Emissions		0.00	0.00	0.01
Total VOC Emissions		**0.02**	**0.02**	**0.11**
Total Non VOC & Non TAP-HC		0.00	0.00	0.01
Total Hydrocarbon Emissions		0.03	0.03	0.12

VOC Emission Total (TPY)	=	Storage Vapors	=	**0.11**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***10-05-SOT-V***

EMISSION SOURCE DESCRIPTION: ***300 BBL Slop Oil Tank-Vent (V-132)***

DATA:

Emission Source:	***Crude Oil Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD - Qavg)**	***7.50***
Maximum Daily Oil Throughput: **(BBLD - Q_{max})**	***7.50***
Average VOC Working Losses - L_W (lb/yr):	***463.528***
Average VOC Standing Losses - L_S (lb/yr):	***859.227***
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	=	**0.17**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**0.23**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**0.75**

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; 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)	0.00	0.0000	0.0000	0.0000
Methane (excluded from VOC total)	6.20	0.0106	0.0143	0.0465
Ethane (excluded from VOC total)	5.60	0.0096	0.0129	0.0420
Propane	17.60	0.0301	0.0407	0.1320
Iso-Butane	1.50	0.0026	0.0035	0.0113
N-Butane	27.10	0.0464	0.0626	0.2033
Iso-Pentane	1.50	0.0026	0.0035	0.0113
N-Pentane	14.60	0.0250	0.0337	0.1095
Heptane	9.20	0.0158	0.0213	0.0690
Octane	6.90	0.0118	0.0159	0.0518
Other NM/NE Hydrocarbons	1.80	0.0031	0.0042	0.0135

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
N-Hexane (TAP)	7.90	0.0135	0.0183	0.0593
Benzene (TAP)	0.10	0.0002	0.0002	0.0008
Total Weight Percent:	100.00			
Total TAP Emissions		0.01	0.02	0.06
Total VOC Emissions		**0.15**	**0.20**	**0.66**
Total Non VOC & Non TAP-HC		0.02	0.03	0.09
Total Hydrocarbon Emissions		0.17	0.23	0.75

VOC Emission Total (TPY)	=	Storage Vapors	=	**0.66**

Emission Calculations

This is a sample calculation for EPNs: 11-05-IOT-V & 12-05-IOT-V.

POINT SOURCE I.D. NUMBER: ***"See Above"***

EMISSION SOURCE DESCRIPTION: ***1000 BBL Inhibitor Oil Tank-Vent (V-133A/B)***

DATA:

Emission Source:	***Crude Oil Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD/Tank - Q_{avg})**	***31.31***
Maximum Daily Oil Throughput: **(BBLD/Tank - Q_{max})**	***109.59***
Average VOC Working Losses - L_w (lb/yr):	***1,960.426***
Average VOC Standing Losses - L_S (lb/yr):	***3,029.915***
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	=	**0.65**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**1.28**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**2.83**

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; 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)	0.00	0.0000	0.0000	0.0000
Methane (excluded from VOC total)	6.20	0.0401	0.0794	0.1754
Ethane (excluded from VOC total)	5.60	0.0362	0.0717	0.1585
Propane	17.60	0.1137	0.2254	0.4980
Iso-Butane	1.50	0.0097	0.0192	0.0424
N-Butane	27.10	0.1751	0.3470	0.7668
Iso-Pentane	1.50	0.0097	0.0192	0.0424
N-Pentane	14.60	0.0943	0.1870	0.4131
Heptane	9.20	0.0594	0.1178	0.2603
Octane	6.90	0.0446	0.0884	0.1952
Other NM/NE Hydrocarbons	1.80	0.0116	0.0230	0.0509

N-Hexane (TAP)	7.90	0.0510	0.1012	0.2235
Benzene (TAP)	0.10	0.0006	0.0013	0.0028
Total TAP Emissions		0.05	0.10	0.23
Total VOC Emissions		**0.57**	**1.13**	**2.50**
Total Non VOC & Non TAP-HC		0.08	0.15	0.33
Total Hydrocarbon Emissions		0.65	1.28	2.83

Calculated Avg. Gas Flowrate (SCFH) = 4.81

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	0.92	0.10	120,000.00
Paraffin Inhibitor	0.88	N/A	60,000.00
Asphaltine Inhibitor	0.93	0.20	60,000.00
Produced Oil	1.7685	6.18	479,982.30
Total Throughput (gallons/year) =			719,982.30

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)**
120,000.00	8,760	0.92		105.11	460.37
Emission Factors*					
A_1	A_2	A_5	A_6	*Throughput Factor (lb)*	*City Factor*
170	*3*	*169*	*3*	*250,000*	*1.31*
A_1 (lb/yr) = 820.19	A_2 (lb/yr) = 14.47			A_5 (lb/yr) = 815.37	A_6 (lb/yr) = 14.47
				Total ΣTPY=	0.83

POLLUTANT:**	**Weight Percent**	**CALCULATED EMISSION RATES**	
		Hourly (lb/hr)	**Annual (TPY)**
1,2,4-Trimethylbenzene	10.00	0.0190	0.0832
1,2,3-Trimethylbenzene	5.00	0.0095	0.0416
1,3,5-Trimethylbenzene	5.00	0.0095	0.0416
Light Aromatic Naphtha	30.00	0.0570	0.2497
Methanol (TAP)	30.00	0.0570	0.2497
Other VOCs	20.00	0.0380	0.1665
Total Weight Percent:	100.00		
Total TAP Emissions		0.06	0.25
Total VOC Emissions		**0.19**	**0.83**
Total Non VOC & Non TAP-HC		0.00	0.00
Total Emissions		0.19	0.83

**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)**
60,000.00		8,760	0.88	50.27	220.18
Emission Factors*					
A_1	*A_2*	*A_5*	*A_6*	*Throughput (lb)*	*City Factor*
34	*1*	*34*	*1*	*50,000*	*1.31*
A_1 (lb/yr) = 392.27		A_2 (lb/yr) = 11.54		A_5 (lb/yr) = 392.27	A_6 (lb/yr) = 11.54
				Total ΣTPY=	0.40

POLLUTANT:**	**Weight Percent**	**CALCULATED EMISSION RATES**	
		Hourly (lb/hr)	**Annual (TPY)**
1,2,4-Trimethylbenzene	10.00	0.0092	0.0404
1,2,3-Trimethylbenzene	5.00	0.0046	0.0202
1,3,5-Trimethylbenzene	5.00	0.0046	0.0202
Light Aromatic Naphtha	20.00	0.0184	0.0808
Xylenes (TAP)	50.00	0.0461	0.2019
Ethylbenzene (TAP)	10.00	0.0092	0.0404
Total Weight Percent:	100.00		
Total TAP Emissions		0.06	0.24
Total VOC Emissions		**0.09**	**0.40**
Total Non VOC & Non TAP-HC		0.00	0.00
Total Emissions		0.09	0.40

**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)**
60,000.00	8,760	0.925	52.84	231.44

Emission Factors*

A_1	A_2	A_5	A_6	*Throughput (lb)*	*City Factor*
34	*1*	*34*	*1*	*50,000*	*1.31*

A_1 (lb/yr) = 412.32 A_2 (lb/yr) = 12.13 A_5 (lb/yr) = 412.32 A_6 (lb/yr) = 12.13

Total ΣTPY=	0.42

POLLUTANT:**	**Weight Percent**	**CALCULATED EMISSION RATES**	
		Hourly (lb/hr)	**Annual (TPY)**
1,2,4-Trimethylbenzene	18.00	0.0174	0.0764
1,2,3-Trimethylbenzene	3.00	0.0029	0.0127
1,3,5-Trimethylbenzene	3.00	0.0029	0.0127
Light Aromatic Naphtha	18.00	0.0174	0.0764
Polymer	37.00	0.0359	0.1570
Triethylenetetramine	3.00	0.0029	0.0127
Toluene (TAP)	18.00	0.0174	0.0764
Total Weight Percent:	100.00		
Total TAP Emissions		0.02	0.08
Total VOC Emissions		**0.10**	**0.42**
Total Non VOC & Non TAP-HC		0.00	0.00
Total Emissions		0.10	0.42

**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)**
479,982	8,760	1.7685	808.15	3539.70

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) = 6300.76 A_2 (lb/yr) = 103.87 A_5 (lb/yr) = 2,089.43 A_6 (lb/yr) = 102.94

Total ΣTPY=	4.30

POLLUTANT:**	**Weight Percent**	**CALCULATED EMISSION RATES**	
		Hourly (lb/hr)	**Annual (TPY)**
Methane (excluded from VOC total)	6.20	0.0608	0.2665
Ethane (excluded from VOC total)	5.60	0.0550	0.2407
Carbon Dioxide (excluded from VOC total)	0.00	0.0000	0.0000
Hydrogen Sulfide (excluded from VOC total)	0.00	0.0000	0.0000
Propane	17.60	0.1727	0.7565
Iso-Butane	1.50	0.0147	0.0645
N-Butane	27.10	0.2660	1.1649

Iso-Pentane	1.50	0.0147	0.0645
N-Pentane	14.60	0.1433	0.6276
Heptanes	9.20	0.0903	0.3955
Octane	6.90	0.0677	0.2966
Other NM/NE Hydrocarbons	1.80	0.0177	0.0774
N-Hexane (TAP)	7.90	0.0775	0.3396
Benzene (TAP)	0.10	0.0010	0.0043
Total Weight Percent:	100.00		
Total TAP Emissions		0.08	0.34
Total VOC Emissions		**0.87**	**3.79**
Total Non VOC & Non TAP-HC		0.12	0.51
Total Emissions		0.98	4.30

**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.

Uncontrolled VOC Emission Total (TPY)	Storage Vapors + Blending Emissions	=	**7.94**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***13-05-ST***

EMISSION SOURCE DESCRIPTION: ***152 BBL Corrosion Chemical Storage Tank-Vent (V-134)***

DATA:

Emission Source:	***"Working" & "Standing" Losses***
Maximum Total Throughput: **(Gallons/Year)**	***420,000***
Average VOC Working Losses - L_w (lb/yr):	***1,369.118***
Average VOC Standing Losses - L_S (lb/yr):	***781.771***
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	=	**0.25**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**1.08**

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 approximately 6,384 gallons and an annual throughput of approximately 420,000 gallons was used in the emissions model in an effort to demonstrate a conservative potential emissions estimate.

Emission Calculations

POINT SOURCE I.D. NUMBER: *14-05-SEP-V*

EMISSION SOURCE DESCRIPTION: *API Oil/Water Separator*

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):	***1,246.393***
Average VOC Standing Losses - L_S (lb/yr):	***4,261.320***
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; 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)	0.00	0.0000	0.0000	0.0000
Methane (excluded from VOC total)	6.20	0.0442	0.0442	0.1936
Ethane (excluded from VOC total)	5.60	0.0399	0.0399	0.1749
Propane	17.60	0.1255	0.1255	0.5496
Iso-Butane	1.50	0.0107	0.0107	0.0468
N-Butane	27.10	0.1932	0.1932	0.8463
Iso-Pentane	1.50	0.0107	0.0107	0.0468
N-Pentane	14.60	0.1041	0.1041	0.4559
Heptane	9.20	0.0656	0.0656	0.2873
Octane	6.90	0.0492	0.0492	0.2155
Other NM/NE Hydrocarbons	1.80	0.0128	0.0128	0.0562

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
N-Hexane (TAP)	7.90	0.0563	0.0563	0.2467
Benzene (TAP)	0.10	0.0007	0.0007	0.0031
Total Weight Percent:	100.00			
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

POINT SOURCE I.D. NUMBER: *15-05-WST-CV*

EMISSION SOURCE DESCRIPTION: *3000 BBL Salt Water Storage Tank-Vent (V-152)*

DATA:

Emission Source:	***Water Storage Vapors ('Working' & 'Standing')***
Average Daily Water Throughput: **(Annual Average; BBLD - Qavg)**	***0***
Maximum Daily Water Throughput: **(BBLD - Q_{max})**	***0***
Average VOC Working Losses - L_W (lb/yr):	***0.000***
Average VOC Standing Losses - L_S (lb/yr):	***232.509***
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	=	**0.13**

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; 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)	0.00	0.0000	0.0000	0.0000
Methane (excluded from VOC total)	6.20	0.0019	0.0019	0.0082
Ethane (excluded from VOC total)	5.60	0.0017	0.0017	0.0074
Propane	17.60	0.0053	0.0053	0.0232
Iso-Butane	1.50	0.0005	0.0005	0.0020
N-Butane	27.10	0.0082	0.0082	0.0357
Iso-Pentane	1.50	0.0005	0.0005	0.0020
N-Pentane	14.60	0.0044	0.0044	0.0192
Heptane	9.20	0.0028	0.0028	0.0121
Octane	6.90	0.0021	0.0021	0.0091
Other NM/NE Hydrocarbons	1.80	0.0005	0.0005	0.0024

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
N-Hexane (TAP)	7.90	0.0024	0.0024	0.0104
Benzene (TAP)	0.10	0.0000	0.0000	0.0001
Total Weight Percent:	100.00			
Total TAP Emissions		0.00	0.00	0.01
Total VOC Emissions		**0.03**	**0.03**	**0.12**
Total Non VOC & Non TAP-HC		0.00	0.00	0.02
Total Hydrocarbon Emissions		0.03	0.03	0.13

VOC Emission Total (TPY)	=	Storage Vapors	=	**0.12**

Emission Calculations

This is a sample calculation for EPNs: 16-05-ST-V & 17-05-ST-V.

POINT SOURCE I.D. NUMBERS: ***"See Above"***

EMISSION SOURCE DESCRIPTION: ***API Separator Tank-Vent (V-154A/B)***

DATA:

Emission Source:	***Crude Oil Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD/Tank - Qavg)**	***0.30***
Maximum Daily Oil Throughput: **(BBLD/Tank - Q_{max})**	***0.60***
Average VOC Working Losses - L_W (lb/yr):	***18.788***
Average VOC Standing Losses - L_S (lb/yr):	***1,059.984***
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	=	**0.14**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**0.14**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**0.61**

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; 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)	0.00	0.0000	0.0000	0.0000
Methane (excluded from VOC total)	6.20	0.0087	0.0088	0.0379
Ethane (excluded from VOC total)	5.60	0.0078	0.0080	0.0343
Propane	17.60	0.0246	0.0250	0.1077
Iso-Butane	1.50	0.0021	0.0021	0.0092
N-Butane	27.10	0.0378	0.0385	0.1658
Iso-Pentane	1.50	0.0021	0.0021	0.0092
N-Pentane	14.60	0.0204	0.0207	0.0893
Heptane	9.20	0.0128	0.0131	0.0563
Octane	6.90	0.0096	0.0098	0.0422
Other NM/NE Hydrocarbons	1.80	0.0025	0.0026	0.0110

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
N-Hexane (TAP)	7.90	0.0110	0.0112	0.0483
Benzene (TAP)	0.10	0.0001	0.0001	0.0006
Total Weight Percent:	100.00			
Total TAP Emissions		0.01	0.01	0.05
Total VOC Emissions		**0.12**	**0.13**	**0.54**
Total Non VOC & Non TAP-HC		0.02	0.02	0.07
Total Hydrocarbon Emissions		0.14	0.14	0.61

VOC Emission Total (TPY)	=	Storage Vapors	=	**0.54**

Emission Calculations

POINT SOURCE I.D. NUMBERS: ***18-05-FE***

EMISSION SOURCE DESCRIPTION: ***Fugitive Emissions***

DATA:

Emission Source:	***Fugitive from Light Liquid & Gas-Service Components***
Light Liquid Service Valves (conservative estimate):	***400***
Gas Service Valves (conservative estimate):	***400***
Number of Pumps [a] (conservative estimate):	***20***
Basis of Emission Estimates:	***U.S. EPA & API Studies***

COMPONENT CALCULATIONS:

	Light Liquid (LL) Service [d]					Gas Service [d]				
Total # of Components [b]	*400*	÷	18.5%	=	*2162*	*400*	÷	*15.0%*	=	*2,667*
# of Valves:					*400*					*400*
# of Connections (Other):	*2162*	x	55.7%	=	*1204*	*2,667*	x	*69.7%*	=	*1,859*
# of Flanges:	*2162*	x	22.8%	=	*493*	*2,667*	x	*11.3%*	=	*301*
# of Open Ends:	*2162*	x	2.0%	=	*43*	*2,667*	x	*2.5%*	=	*67*
# of "Others" [c]	*2162*	x	1.0%	=	*22*	*2,667*	x	*1.5%*	=	*40*

EMISSION CALCULATIONS:

	Count - by Service			THC Emission Factors [e] (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
Connections (Others)	1204	1,859	3063	2.1E-04	2.0E-04	0.558	0.820	2.44	3.59
Flanges	493	301	794	1.1E-04	3.9E-04	0.120	0.259	0.52	1.13
Open Ends	43	67	110	1.4E-03	2.0E-03	0.133	0.294	0.58	1.29
Pumps[a]	20		20	1.3E-02	2.4E-03	0.573	N/A	2.51	N/A
Valves	400	400	800	2.5E-03	4.5E-03	2.205	3.968	9.66	17.38
"Others"[b]	22	40	62	7.5E-03	8.8E-03	0.358	0.776	1.57	3.40
TOTALS:	**2,182**	**2,667**	**4,849**			**3.95**	**6.12**	**17.28**	**26.79**

[a] Process Pumps Only

[b] Assumes that pumps are not considered within the "total components by type" factors

[c] "Others" equipment derived from compressors, diaphragms, drains, dump arms, hatches, instruments, meters, pressure relief valves, polished rods, relief valves, and vents

[d] Refer to Table 4 (API Publication 4589) & Table 5 (API Publication 4615), copy included in ensuing pages

[e] 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".

EMISSIONS SUMMARY:

Component	Weight Percent	Calculated Emission Rate	
		Avg. Hourly (lb/hr)	Total (Tons)
Hydrogen Sulfide (TAP; excluded from VOC total)	0.0	0.0000	0.0000
NMEHC (expressed as VOC)	29.2	1.1522	5.0467
Benzene (TAP)	0.027	0.0011	0.0047
Ethylbenzene (TAP)	0.0170	0.0007	0.0029
Toluene (TAP)	0.075	0.0030	0.0130
Xylenes (m,p,o) (TAP)	0.036	0.0014	0.0062
TOTAL TAP EMISSIONS:		0.01	0.03
TOTAL VOC EMISSIONS:		**1.15**	**5.05**

GAS SERVICE SPECIATION FACTORS:

Speciation of the emission stream from components in gas service is based on an actual wet gas analysis; refer to Southern Petroleum Laboratories Report No.: 172-23080185-002A in ensuing pages.

EMISSIONS SUMMARY:

Component	Weight Percent	Calculated Emission Rate	
		Avg. Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.2898	0.0177	0.0776
Carbon Dioxide (excluded from VOC total)	96.1167	5.8794	25.7518
Methane (excluded from VOC total)	1.2535	0.0767	0.3358
Ethane (excluded from VOC total)	0.3653	0.0223	0.0979
Hydrogen Sulfide (TAP; excluded from VOC total)	0.0000	0.0000	0.0000
Propane	0.4569	0.0279	0.1224
Iso-Butane	0.1489	0.0091	0.0399
N-Butane	0.3750	0.0229	0.1005
Iso-Pentane	0.2078	0.0127	0.0557
N-Pentane	0.1761	0.0108	0.0472
Iso-Hexanes	0.1337	0.0082	0.0358
N-Hexane (TAP)	0.0736	0.0045	0.0197
Methylcyclopentane	0.0000	0.0000	0.0000
Benzene (TAP)	0.0165	0.0010	0.0044
Cyclohexane	0.0421	0.0026	0.0113
Heptanes	0.1364	0.0083	0.0365
Methylcyclohexane	0.0534	0.0033	0.0143
Toluene (TAP)	0.0070	0.0004	0.0019

2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000
Octanes	0.0696	0.0043	0.0186
Ethylbenzene (TAP)	0.0010	0.0001	0.0003
Xylenes (TAP)	0.0076	0.0005	0.0020
Nonanes	0.0520	0.0032	0.0139
Decanes Plus	0.0171	0.0010	0.0046
TOTAL WEIGHT PERCENT:	100.0000		
TOTAL TAP EMISSIONS:		0.01	0.03
TOTAL VOC EMISSIONS:		**0.12**	**0.53**
TOTAL Non-VOC & Non-TAP HC		0.10	0.43
TOTAL Emissions		6.12	26.79

Facility-Wide VOC Fugitive Totals	=	**1.27 lb/hr**	**5.58 Tons**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***19-05-F***

EMISSION SOURCE DESCRIPTION: ***Control Flare***

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 flare gas analysis):	***610***
Purge Gas Feed:	***Yes***
Gas Heat of Combustion (BTU/Ft^3-actual fuel gas analysis):	***1007***
Flare Gas Feed:	***Yes***
Gas Heat of Combustion (BTU/Ft^3-actual fuel gas analysis):	***1007***
Pilot Gas Feed:	***Yes***
Gas Heat of Combustion (BTU/Ft^3-actual fuel gas analysis):	***1007***
Combustion Efficiency:	***98% for all HC***

Gas Stream #1 - Oil Storage Tank Vapors

Gas volume estimates are supported by the calculations associated with EPNs: 5-05-OST-V, 6-05-OST-V, 7-05-OST-V, & 29-09-OST-CV and are outlined below:

INPUT

Maximum Gas Flowrate (scf/hr)	*Operating Time (hrs)*	*Burn Efficiency (%)*	*Gas Heat of Combustion (BTU/FT^3)*	*Specific Gravity of Gas*
4,148	*8,760*	*98*	*610*	*1.4560*

CALCULATIONS

Gas Combusted (annual hourly average)	=	*gas rate (scf/hr)*	*x*	*efficiency*	*x*	*usage (hrs)*
	=	*4,148*	*x*	*0.98*	*x*	*8,760*
	=	***35,609,750 scf***		=	***4,065 SCF/hr***	
Heat Content (annual hourly average)	=	gas rate (scf/yr)	x	gas heat of combustion (BTU/scf)		
	=	*35,609,750*	*x*	*610*		
	=				***2.4776 MMBTU/Hr***	
Uncontrolled Max. Hourly Emissions (lbs/hr)	=	*gas specific gravity*	*x*	*density of air (lb/SCF)*	*x*	*Maximum Gas Rate (SCF/Hr)*
	=	*1.4560*	*x*	*0.0764*	*x*	*4,148*
	=	***461.42 lbs/hr***				
Uncontrolled Annual Emissions (TPY)	=	*gas specific gravity*	*x*	*density of air (tons/SCF)*	*x*	*Total Gas Rate (SCF/Yr)*
	=	*1.4560*	*x*	*0.0000382*	*x*	*36,336,480*
	=	***2,021.01 TPY***				

SPECIATION FACTORS:

Speciation of the flash gas mixture is based on an actual flare gas analysis; refer to Southern Petroleum Laboratories Report No.: 172-23080185-001A 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)	15.0552	69.4672	69.4672	304.2665
Carbon Dioxide (excluded from VOC total)	58.8718	271.6444	271.6444	1189.8026
Methane (excluded from VOC total)	1.5789	0.1457	0.1457	0.6382
Ethane (excluded from VOC total)	0.9593	0.0885	0.0885	0.3878
Hydrogen Sulfide (TAP; excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	4.1670	0.3845	0.3845	1.6843
Iso-Butane	2.3731	0.2190	0.2190	0.9592
N-Butane	6.1906	0.5713	0.5713	2.5022
Iso-Pentane	3.8118	0.3518	0.3518	1.5407
N-Pentane	2.8164	0.2599	0.2599	1.1384
Iso-Hexanes	1.8356	0.1694	0.1694	0.7420
N-Hexane (TAP)	0.7025	0.0648	0.0648	0.2840
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.1517	0.0140	0.0140	0.0613
Cyclohexane	0.3024	0.0279	0.0279	0.1222
Heptanes	0.8032	0.0741	0.0741	0.3247
Methylcyclohexane	0.1555	0.0144	0.0144	0.0629
Toluene (TAP)	0.0068	0.0006	0.0006	0.0027
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.1273	0.0117	0.0117	0.0515
Ethylbenzene (TAP)	0.0015	0.0001	0.0001	0.0006
Xylenes (TAP)	0.0033	0.0003	0.0003	0.0013
Nonanes	0.0600	0.0055	0.0055	0.0243
Decanes Plus	0.0261	0.0024	0.0024	0.0105
Other NM/NE HC	0.0000	0.0000	0.0000	0.0000
TOTAL WEIGHT PERCENT:	100.000			
TOTAL TAP EMISSIONS:		0.08	0.08	0.35
TOTAL VOC EMISSIONS:		**2.17**	**2.17**	**9.51**
TOTAL Non-VOC & Non-TAP HC:		0.23	0.23	1.03
TOTAL EMISSIONS:		343.52	343.52	1504.61

Purge Gas (maximum gas flowrate based on conservative estimate):

INPUT						
Maximum Gas Flowrate (scf/hr)	*Operating Time (hrs)*	*Burn Efficiency (%)*	*Gas Heat of Combustion (BTU/FT^3)*		*Specific Gravity of Gas*	
150	*8760*	*98*	*1007*		*0.5882*	
CALCULATIONS						
Gas Combusted (annual hourly average)	=	*gas rate (scf/hr)*	*x*	*efficiency*	*x*	*usage (hrs)*
	=	*150*	*x*	*0.98*	*x*	*8,760*
	=	***1,287,720 scf***		=	***147 SCF/hr***	
Heat Content (annual hourly average)	=	gas rate (scf/yr)	x	gas heat of combustion (BTU/scf)		
	=	*1,287,720*	*x*	*1007*		
	=				***0.1480 MMBTU/Hr***	
Uncontrolled Max. Hourly Emissions (lbs/hr)	=	*gas specific gravity*	*x*	*density of air (lb/SCF)*	*x*	*Maximum Gas Rate (SCF/Hr)*
	=	*0.5882*	*x*	*0.0764*	*x*	*150*
	=	***6.74 lbs/hr***				
Uncontrolled Annual Emissions (TPY)	=	*gas specific gravity*	*x*	*density of air (tons/SCF)*	*x*	*Total Gas Rate (SCF/Yr)*
	=	*0.5882*	*x*	*0.0000382*	*x*	*1,314,000*
	=	***29.52 TPY***				

SPECIATION FACTORS:

Speciation of the purge gas is based on an actual fuel gas analysis; refer to Southern Petroleum Laboratories Report No.: 2030-13110169-001A 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)	2.276	0.1534	0.1534	0.6720
Carbon Dioxide (excluded from VOC total)	4.019	0.2709	0.2709	1.1866
Methane (excluded from VOC total)	89.635	0.1208	0.1208	0.5293
Ethane (excluded from VOC total)	3.158	0.0043	0.0043	0.0186
Hydrogen Sulfide (TAP; excluded from VOC total)	0.000	0.0000	0.0000	0.0000
Propane	0.345	0.0005	0.0005	0.0020
Iso-Butane	0.072	0.0001	0.0001	0.0004
N-Butane	0.089	0.0001	0.0001	0.0005
Iso-Pentane	0.042	0.0001	0.0001	0.0002
N-Pentane	0.030	0.0000	0.0000	0.0002
Iso-Hexanes	0.059	0.0001	0.0001	0.0003
N-Hexane (TAP)	0.039	0.0001	0.0001	0.0002
Methylcyclopentane	0.000	0.0000	0.0000	0.0000

Benzene (TAP)	0.042	0.0001	0.0001	0.0002
Cyclohexane	0.008	0.0000	0.0000	0.0000
Heptanes	0.096	0.0001	0.0001	0.0006
Methylcyclohexane	0.000	0.0000	0.0000	0.0000
Toluene (TAP)	0.016	0.0000	0.0000	0.0001
2,2,4-Trimethylpentane (TAP)	0.055	0.0001	0.0001	0.0003
Octanes	0.013	0.0000	0.0000	0.0001
Ethylbenzene (TAP)	0.000	0.0000	0.0000	0.0000
Xylenes (TAP)	0.000	0.0000	0.0000	0.0000
Nonanes	0.006	0.0000	0.0000	0.0000
Decanes Plus	0.000	0.0000	0.0000	0.0000
Other Nm/NE HC	0.000	0.0000	0.0000	0.0000
TOTAL WEIGHT PERCENT:	100.000			
TOTAL TAP EMISSIONS:		0.00	0.00	0.00
TOTAL VOC EMISSIONS:		**0.00**	**0.00**	**0.01**
TOTAL Non-VOC & Non-TAP HC:		0.13	0.13	0.55
TOTAL EMISSIONS:		0.55	0.55	2.41

Flare Gas (maximum gas flowrate based on conservative estimate):

INPUT					
Maximum Gas Flowrate (scf/hr)	*Operating Time (hrs)*	*Burn Efficiency (%)*	*Gas Heat of Combustion (BTU/FT^3)*	*Specific Gravity of Gas*	
20,000	*8760*	*98*	*1007*	*0.5882*	

CALCULATIONS						
Gas Combusted (annual hourly average)	=	*gas rate (scf/hr)*	*x*	*efficiency*	*x*	*usage (hrs)*
	=	*20,000*	*x*	*0.98*	*x*	*8,760*
	=	***171,696,000 scf***		=	***19,600 SCF/hr***	
Heat Content (annual hourly average)	=	gas rate (scf/yr)	x	gas heat of combustion (BTU/scf)		
	=	*171,696,000*	*x*	*1007*		
	=				***19.7372 MMBTU/Hr***	
Uncontrolled Max. Hourly Emissions (lbs/hr)	=	*gas specific gravity*	*x*	*density of air (lb/SCF)*	*x*	*Maximum Gas Rate (SCF/Hr)*
	=	*0.5882*	*x*	*0.0764*	*x*	*20,000*
	=	***898.77 lbs/hr***				
Uncontrolled Annual Emissions (TPY)	=	*gas specific gravity*	*x*	*density of air (tons/SCF)*	*x*	*Total Gas Rate (SCF/Yr)*
	=	*0.5882*	*x*	*0.0000382*	*x*	*175,200,000*
	=	***3,936.61 TPY***				

SPECIATION FACTORS:

Speciation of the flare gas is based on an actual fuel gas analysis; refer to Southern Petroleum Laboratories Report No.: 2030-13110169-001A 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)	2.276	20.4560	20.4560	89.5973
Carbon Dioxide (excluded from VOC total)	4.019	36.1216	36.1216	158.2124
Methane (excluded from VOC total)	89.635	16.1122	16.1122	70.5716
Ethane (excluded from VOC total)	3.158	0.5677	0.5677	2.4864
Hydrogen Sulfide (TAP; excluded from VOC total)	0.000	0.0000	0.0000	0.0000
Propane	0.345	0.0620	0.0620	0.2716
Iso-Butane	0.072	0.0129	0.0129	0.0567
N-Butane	0.089	0.0160	0.0160	0.0701
Iso-Pentane	0.042	0.0075	0.0075	0.0331
N-Pentane	0.030	0.0054	0.0054	0.0236
Iso-Hexanes	0.059	0.0106	0.0106	0.0465
N-Hexane (TAP)	0.039	0.0070	0.0070	0.0307
Methylcyclopentane	0.000	0.0000	0.0000	0.0000
Benzene (TAP)	0.042	0.0075	0.0075	0.0331
Cyclohexane	0.008	0.0014	0.0014	0.0063
Heptanes	0.096	0.0173	0.0173	0.0756
Methylcyclohexane	0.000	0.0000	0.0000	0.0000
Toluene (TAP)	0.016	0.0029	0.0029	0.0126
2,2,4-Trimethylpentane (TAP)	0.055	0.0099	0.0099	0.0433
Octanes	0.013	0.0023	0.0023	0.0102
Ethylbenzene (TAP)	0.000	0.0000	0.0000	0.0000
Xylenes (TAP)	0.000	0.0000	0.0000	0.0000
Nonanes	0.006	0.0011	0.0011	0.0047
Decanes Plus	0.000	0.0000	0.0000	0.0000
Other Nm/NE HC	0.000	0.0000	0.0000	0.0000
TOTAL WEIGHT PERCENT:	100.000			
TOTAL TAP EMISSIONS:		0.03	0.03	0.12
TOTAL VOC EMISSIONS:		**0.16**	**0.16**	**0.72**
TOTAL Non-VOC & Non-TAP HC:		16.68	16.68	73.06
TOTAL EMISSIONS:		73.42	73.42	321.59

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

INPUT						
Maximum Gas Flowrate (scf/hr)	*Operating Time (hrs)*	*Burn Efficiency (%)*	*Gas Heat of Combustion (BTU/FT^3)*		*Specific Gravity of Gas*	
150	*8,760*	*98*	*1007*		*0.5882*	
CALCULATIONS						
Gas Combusted (annual hourly average)	=	*gas rate (scf/hr)*	*x*	*efficiency*	*x*	*usage (hrs)*
	=	*150*	*x*	*0.98*	*x*	*8,760*
	=	***1,287,720 scf***		=	***147 SCF/hr***	
Heat Content (annual hourly average)	=	gas rate (scf/yr)	x	gas heat of combustion (BTU/scf)		
	=	*1,287,720*	*x*	*1007*		
	=				***0.1480 MMBTU/Hr***	
Uncontrolled Max. Hourly Emissions (lbs/hr)	=	*gas specific gravity*	*x*	*density of air (lb/SCF)*	*x*	*Maximum Gas Rate (SCF/Hr)*
	=	*0.5882*	*x*	*0.0764*	*x*	*150*
	=	***6.74 lbs/hr***				
Uncontrolled Annual Emissions (TPY)	=	*gas specific gravity*	*x*	*density of air (tons/SCF)*	*x*	*Total Gas Rate (SCF/Yr)*
	=	*0.5882*	*x*	*0.0000382*	*x*	*1,314,000*
	=	***29.52 TPY***				

SPECIATION FACTORS:

Speciation of the pilot gas is based on an actual fuel gas analysis; refer to Southern Petroleum Laboratories Report No.: 2030-13110169-001A 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)	2.276	0.1534	0.1534	0.6720
Carbon Dioxide (excluded from VOC total)	4.019	0.2709	0.2709	1.1866
Methane (excluded from VOC total)	89.635	0.1208	0.1208	0.5293
Ethane (excluded from VOC total)	3.158	0.0043	0.0043	0.0186
Hydrogen Sulfide (TAP; excluded from VOC total)	0.000	0.0000	0.0000	0.0000
Propane	0.345	0.0005	0.0005	0.0020
Iso-Butane	0.072	0.0001	0.0001	0.0004
N-Butane	0.089	0.0001	0.0001	0.0005
Iso-Pentane	0.042	0.0001	0.0001	0.0002
N-Pentane	0.030	0.0000	0.0000	0.0002
Iso-Hexanes	0.059	0.0001	0.0001	0.0003
N-Hexane (TAP)	0.039	0.0001	0.0001	0.0002
Methylcyclopentane	0.000	0.0000	0.0000	0.0000

Benzene (TAP)	0.042	0.0001	0.0001	0.0002
Cyclohexane	0.008	0.0000	0.0000	0.0000
Heptanes	0.096	0.0001	0.0001	0.0006
Methylcyclohexane	0.000	0.0000	0.0000	0.0000
Toluene (TAP)	0.016	0.0000	0.0000	0.0001
2,2,4-Trimethylpentane (TAP)	0.055	0.0001	0.0001	0.0003
Octanes	0.013	0.0000	0.0000	0.0001
Ethylbenzene (TAP)	0.000	0.0000	0.0000	0.0000
Xylenes (TAP)	0.000	0.0000	0.0000	0.0000
Nonanes	0.006	0.0000	0.0000	0.0000
Decanes Plus	0.000	0.0000	0.0000	0.0000
Other Nm/NE HC	0.000	0.0000	0.0000	0.0000
TOTAL WEIGHT PERCENT:	100.000			
TOTAL TAP EMISSIONS:		0.00	0.00	0.00
TOTAL VOC EMISSIONS:		**0.00**	**0.00**	**0.01**
TOTAL Non-VOC & Non-TAP HC:		0.13	0.13	0.55
TOTAL EMISSIONS:		0.55	0.55	2.41

Total of Average Hourly VOC emissions estimated for this source:	**2.33 Lbs/Hr**
Total of Maximum Hourly VOC emissions estimated for this source:	**2.33 Lbs/Hr**
Total of Maximum Annual VOC emissions estimated for this source:	**10.25 TPY**

CALCULATIONS - Selected Combustion Products

Summary of all routine streams combusted by this flare:

Gas Stream	*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	4148	4148	2.4776	2.4776
Purge Gas Feed	8760	150	150	0.1480	0.1480
Flare Gas Feed	8760	20000	20000	19.7372	19.7372
Pilot Gas Feed	8760	150	150	0.1480	0.1480
Totals:		***24,448***	***24,448***	***22.51***	***22.51***

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	0.27	0.27	1.18
Soot (expressed as $PM_{2.5}$)	0.000011	0.27	0.27	1.18
SO_2	N/A	0.00	0.00	0.00

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	1.44	1.44	6.32
CO	0.5496	12.37	12.37	54.19

Emission Calculations

POINT SOURCE I.D. NUMBER: ***21-05-CB***

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

DATA:

Emission Source:	***Compressor Blowdowns***
Gas Specific Gravity:	***1.460***
Maximum Volume per Blowdown (MSCF): *(conservative estimate provided by operator)*	***23.2***
Maximum Number of Blowdowns:	***24***
Basis of Emission Estimates:	***Conservative Estimate Provided by Operator & Representative Analysis***

Blowdown Gas Volume (SCF/Yr)	=	Volume per Blowdown * Total # of Blowdowns * 1000	=	**556800.00**
Avg. Hourly Uncontrolled Emissions (lb/hr)	=	Gas Gravity * Density of Air * Volume per Blowdown	=	**2587.82**
Max. Hourly Uncontrolled Emissions (lb/hr)	=	Avg. Emissions	=	**2587.82**
Annual Potential Uncontrolled Emissions (TPY)	=	Hourly * Total # of Blowdowns / 2000	=	**31.05**

SPECIATION FACTORS:

Speciation of the blowdown gas mixture is based on representative data provided by operator; refer to 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)	0.3506	9.0722	9.0722	0.1089
Carbon Dioxide (excluded from VOC total)	95.3440	2467.3327	2467.3327	29.6080
Methane (excluded from VOC total)	2.1744	56.2688	56.2688	0.6752
Ethane (excluded from VOC total)	0.5467	14.1480	14.1480	0.1698
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	0.5935	15.3587	15.3587	0.1843
Iso-Butane	0.1510	3.9067	3.9067	0.0469
N-Butane	0.3706	9.5892	9.5892	0.1151
Iso-Pentane	0.1874	4.8495	4.8495	0.0582
N-Pentane	0.1533	3.9678	3.9678	0.0476
Iso-Hexane	0.0780	2.0173	2.0173	0.0242
N-Hexane (TAP)	0.0181	0.4673	0.4673	0.0056
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.0037	0.0948	0.0948	0.0011
Cyclohexane	0.0000	0.0000	0.0000	0.0000
Heptanes	0.0098	0.2524	0.2524	0.0030

Methylcyclohexane	0.0000	0.0000	0.0000	0.0000
Toluene (TAP)	0.0037	0.0963	0.0963	0.0012
2,2,4-Trimethylpentane (TAP)	0.0043	0.1118	0.1118	0.0013
Octanes Plus	0.0098	0.2538	0.2538	0.0030
Ethylbenzene (TAP)	0.0002	0.0054	0.0054	0.0001
Xylenes (TAP)	0.0011	0.0280	0.0280	0.0003
Total Weight Percent:	100.0000			
Total TAP Emissions		0.80	0.80	0.01
Total VOC Emissions		**41.00**	**41.00**	**0.49**
Total Non VOC & Non TAP-HC		70.42	70.42	0.85
Total Emissions		2587.82	2587.82	31.05

VOC Emission Total (TPY)	=	Compressor Blowdowns	=	**0.49**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***23-05-CB***

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

DATA:

Emission Source:	***Compressor Blowdowns***
Gas Specific Gravity:	***1.460***
Maximum Volume per Blowdown (MSCF): *(conservative estimate provided by operator)*	***23.2***
Maximum Number of Blowdowns:	***24***
Basis of Emission Estimates:	***Conservative Estimate Provided by Operator & Representative Analysis***

Blowdown Gas Volume (SCF)	=	Volume per Blowdown * Total # of Blowdowns * 1000	=	**556800.00**
Avg. Hourly Uncontrolled Emissions (lb/hr)	=	Gas Gravity * Density of Air * Volume per Blowdown	=	**2587.82**
Max. Hourly Uncontrolled Emissions (lb/hr)	=	Avg. Emissions	=	**2587.82**
Total Potential Uncontrolled Emissions (Tons)	=	Hourly * Total # of Blowdowns / 2000	=	**31.05**

SPECIATION FACTORS:

Speciation of the blowdown gas mixture is based on representative data provided by operator; refer to ensuing pages.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Total (Tons)
Nitrogen (excluded from VOC total)	0.3506	9.0722	9.0722	0.1089
Carbon Dioxide (excluded from VOC total)	95.3440	2467.3327	2467.3327	29.6080
Methane (excluded from VOC total)	2.1744	56.2688	56.2688	0.6752
Ethane (excluded from VOC total)	0.5467	14.1480	14.1480	0.1698
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	0.5935	15.3587	15.3587	0.1843
Iso-Butane	0.1510	3.9067	3.9067	0.0469
N-Butane	0.3706	9.5892	9.5892	0.1151
Iso-Pentane	0.1874	4.8495	4.8495	0.0582
N-Pentane	0.1533	3.9678	3.9678	0.0476
Iso-Hexane	0.0780	2.0173	2.0173	0.0242
N-Hexane (TAP)	0.0181	0.4673	0.4673	0.0056
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.0037	0.0948	0.0948	0.0011
Cyclohexane	0.0000	0.0000	0.0000	0.0000
Heptanes	0.0098	0.2524	0.2524	0.0030

Methylcyclohexane	0.0000	0.0000	0.0000	0.0000
Toluene (TAP)	0.0037	0.0963	0.0963	0.0012
2,2,4-Trimethylpentane (TAP)	0.0043	0.1118	0.1118	0.0013
Octanes Plus	0.0098	0.2538	0.2538	0.0030
Ethylbenzene (TAP)	0.0002	0.0054	0.0054	0.0001
Xylenes (TAP)	0.0011	0.0280	0.0280	0.0003
Total Weight Percent:	100.0000			
Total TAP Emissions		0.80	0.80	0.01
Total VOC Emissions		**41.00**	**41.00**	**0.49**
Total Non VOC & Non TAP-HC		70.42	70.42	0.85
Total Emissions		2587.82	2587.82	31.05

VOC Emission Total (Tons)	=	Compressor Blowdowns	=	**0.49**

Emission Calculations

Emission calculations shown below are presented for informational purposes only as vapors from the dry oil tank are routed to the control flare (EPN: 19-05-F) for combustion, except during brief intervals when thief hatches are opened for purposes of sampling, gauging, etc.

POINT SOURCE I.D. NUMBER: ***29-09-OST-CV***

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

DATA:

Emission Source:	***Crude Oil Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD - Q_{avg})**	***2500***
Maximum Daily Oil Throughput: **(BBLD - Q_{max})**	***4000***
Average VOC Working Losses - L_w (lb/yr):	***155,519.869***
Average VOC Standing Losses - L_S (lb/yr):	***10,235.727***
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	=	**21.46**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**33.54**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**93.98**

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; 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)	0.00	0.0000	0.0000	0.0000
Methane (excluded from VOC total)	6.20	1.3304	2.0793	5.8270
Ethane (excluded from VOC total)	5.60	1.2016	1.8781	5.2631
Propane	17.60	3.7765	5.9025	16.5411
Iso-Butane	1.50	0.3219	0.5031	1.4098
N-Butane	27.10	5.8150	9.0885	25.4695
Iso-Pentane	1.50	0.3219	0.5031	1.4098
N-Pentane	14.60	3.1328	4.8964	13.7216
Heptane	9.20	1.9741	3.0854	8.6465
Octane	6.90	1.4806	2.3140	6.4849

Other NM/NE Hydrocarbons	1.80	0.3862	0.6037	1.6917
N-Hexane (TAP)	7.90	1.6951	2.6494	7.4247
Benzene (TAP)	0.10	0.0215	0.0335	0.0940
Total TAP Emissions		1.72	2.68	7.52
Total VOC Emissions		**18.93**	**29.58**	**82.89**
Total Non VOC & Non TAP-HC		2.53	3.96	11.09
Total Hydrocarbon Emissions		21.46	33.54	93.98

DATA:

Emission Source:	***Flash Gas from Oil***
Flash Gas Specific Gravity:	***1.554***
Average Oil Throughput: **(BBLD)**	***2500***
Maximum Oil Throughput: **(BBLD)**	***4000***
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; refer to Southern Petroleum Laboratories Report No.: 23080185-005A 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:			
40.86	55	80	
	0	60	23.20
		Prorated GOR Estimate:	**23.20**

Avg. Hourly Uncontrolled Flash Rate (SCF/Hr)	=	Oil Rate * GOR	=	**2416.67**
Avg. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Flash Gas Gravity * Density of Air * Flash Rate	=	**286.92**
Max. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Avg. Emissions * Ratio of Max. Oil Rate to Avg. Oil Rate	=	**459.07**
Annual Potential Uncontrolled Flash Emissions (TPY)	=	Hourly * 8760/2000	=	**1256.71**

SPECIATION FACTORS:

Speciation of the flash gas mixture taken from the referenced laboratory results; refer to Southern Petroleum Laboratories Report No.: 23080185-005A 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)	1.970	5.6523	9.0437	24.7572
Carbon Dioxide (excluded from VOC total)	83.435	239.3922	383.0275	1048.5357
Methane (excluded from VOC total)	0.324	0.9296	1.4874	4.0717
Ethane (excluded from VOC total)	0.788	2.2609	3.6175	9.9029
Hydrogen Sulfide (excluded from VOC total)	0.000	0.0000	0.0000	0.0000
Propane	2.932	8.4125	13.4600	36.8467
Iso-Butane	1.475	4.2321	6.7713	18.5365
N-Butane	3.626	10.4037	16.6460	45.5683
Iso-Pentane	1.861	5.3396	8.5433	23.3874
N-Pentane	1.464	4.2005	6.7208	18.3982
Iso-Hexane	0.621	1.7818	2.8508	7.8042
N-Hexane (TAP)	0.646	1.8535	2.9656	8.1183
Methylcyclopentane	0.144	0.4132	0.6611	1.8097
Benzene (TAP)	0.077	0.2209	0.3535	0.9677
Cyclohexane	0.209	0.5997	0.9595	2.6265
Heptanes	0.217	0.6226	0.9962	2.7271
Methylcyclohexane	0.037	0.1062	0.1699	0.4650
Toluene (TAP)	0.008	0.0230	0.0367	0.1005
2,2,4-Trimethylpentane (TAP)	0.000	0.0000	0.0000	0.0000
Octanes	0.061	0.1750	0.2800	0.7666
Ethylbenzene (TAP)	0.002	0.0057	0.0092	0.0251
Xylenes (TAP)	0.012	0.0344	0.0551	0.1508
Nonanes	0.055	0.1578	0.2525	0.6912
Decanes Plus	0.036	0.1033	0.1653	0.4524
Total Weight Percent:	100.000			
Total TAP Emissions		2.14	3.42	9.36
Total VOC Emissions		**38.69**	**61.90**	**169.44**
Total Non VOC & Non TAP-HC		3.19	5.10	13.97
Total Emissions		286.92	459.07	1256.71

Uncontrolled VOC Emission Total (TPY)	Storage Vapors + Oil Flash	=	**252.33**

DATA:

Emission Source:	***Losses When Opening Thief Hatches***
Specific Gravity of Gas:	***1.554***
Maximum Thief Hatch Venting (Hrs/Yr) **(Under Normal/Routine Operating Conditions)**	***30***
Number of Tanks in Vent System:	***2***
Max. Minutes a Hatch is Opened in a Single Hour:	***5***
Maximum Hourly Emission Rate (lb/hr): **(from preceding tank emission estimates)**	***41.05***

Avg. Hourly Emissions (lb/hr)	=	Annual Total/8760 (hrs/yr)	=	**0.86**
Maximum Hourly Emissions (lb/hr)	=	Max. Emission Rate * Max. Minutes/Hr Hatch is Open	=	**41.05**
Maximum Annual Emissions (TPY)	=	Max. Hourly THC Rate * Hours/Yr Hatch is Open	=	**3.75**

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)	1.970	0.017	0.809	0.074
Carbon Dioxide (excluded from VOC total)	83.435	0.714	34.250	3.125
Methane (excluded from VOC total)	0.324	0.003	0.133	0.012
Ethane (excluded from VOC total)	0.788	0.007	0.323	0.030
Hydrogen Sulfide (excluded from VOC total)	0.000	0.000	0.000	0.000
Propane	2.932	0.025	1.204	0.110
Iso-Butane	1.475	0.013	0.605	0.055
N-Butane	3.626	0.031	1.488	0.136
Iso-Pentane	1.861	0.016	0.764	0.070
N-Pentane	1.464	0.013	0.601	0.055
Iso-Hexane	0.621	0.005	0.255	0.023
N-Hexane (TAP)	0.646	0.006	0.265	0.024
Methylcyclopentane	0.144	0.001	0.059	0.005
Benzene (TAP)	0.077	0.001	0.032	0.003
Cyclohexane	0.209	0.002	0.086	0.008
Heptanes	0.217	0.002	0.089	0.008
Methylcyclohexane	0.037	0.000	0.015	0.001
Toluene (TAP)	0.008	0.000	0.003	0.000
2,2,4-Trimethylpentane (TAP)	0.000	0.000	0.000	0.000
Octanes	0.061	0.001	0.025	0.002
Ethylbenzene (TAP)	0.002	0.000	0.001	0.000
Xylenes (TAP)	0.012	0.000	0.005	0.000
Nonanes	0.055	0.000	0.023	0.002

Decanes Plus	0.036	0.000	0.015	0.001
Other NM/NE HC	0.000	0.000	0.000	0.000
Total Weight Percent:	100.000			
Total TAP Emissions		0.01	0.31	0.03
Total VOC Emissions		**0.12**	**5.53**	**0.51**
Total Non VOC & Non TAP-HC		0.01	0.46	0.04
Total Emissions		0.86	41.05	3.75

Emission Calculations

POINT SOURCE I.D. NUMBER: ***30-09-IOT-CV***

EMISSION SOURCE DESCRIPTION: ***1500 BBL Inhibitor Oil Tank-Common Vent (V-133C)***

DATA:

Emission Source:	***Crude Oil Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD - Q_{avg})**	***46.97***
Maximum Daily Oil Throughput: **(BBLD - Q_{max})**	***109.59***
Average VOC Working Losses - L_W (lb/yr):	***2,905.166***
Average VOC Standing Losses - L_S (lb/yr):	***3,145.985***
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	=	**0.78**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**1.28**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**3.43**

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; 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)	0.00	0.0000	0.0000	0.0000
Methane (excluded from VOC total)	6.20	0.0486	0.0797	0.2127
Ethane (excluded from VOC total)	5.60	0.0439	0.0719	0.1921
Propane	17.60	0.1379	0.2261	0.6039
Iso-Butane	1.50	0.0118	0.0193	0.0515
N-Butane	27.10	0.2123	0.3482	0.9298
Iso-Pentane	1.50	0.0118	0.0193	0.0515
N-Pentane	14.60	0.1144	0.1876	0.5009
Heptane	9.20	0.0721	0.1182	0.3157
Octane	6.90	0.0541	0.0886	0.2367
Other NM/NE Hydrocarbons	1.80	0.0141	0.0231	0.0618

N-Hexane (TAP)	7.90	0.0619	0.1015	0.2710
Benzene (TAP)	0.10	0.0008	0.0013	0.0034
Total TAP Emissions		0.06	0.10	0.27
Total VOC Emissions		**0.69**	**1.13**	**3.03**
Total Non VOC & Non TAP-HC		0.09	0.15	0.40
Total Hydrocarbon Emissions		0.78	1.28	3.43

Calculated Avg. Gas Flowrate (SCFH) =	*5.77*

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	0.92	0.10	180,000.00
Paraffin Inhibitor	0.88	N/A	90,000.00
Asphaltine Inhibitor	0.93	0.20	90,000.00
Produced Oil	1.7685	6.18	720,050.10
Total Throughput (gallons/year) =			1,080,050.10

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)**
180,000.00	8,760	0.92		157.66	690.55
Emission Factors*					
A_1	A_2	A_5	A_6	*Throughput Factor (lb)*	*City Factor*
170	*3*	*169*	*3*	*250,000*	*1.31*
A_1 (lb/yr) = 1230.29	A_2 (lb/yr) = 21.71		A_5 (lb/yr) = 1,223.05		A_6 (lb/yr) = 21.71
				Total ΣTPY=	1.25

POLLUTANT:**	**Weight Percent**	**CALCULATED EMISSION RATES**	
		Hourly (lb/hr)	**Annual (TPY)**
1,2,4-Trimethylbenzene	10.00	0.0285	0.1248
1,2,3-Trimethylbenzene	5.00	0.0143	0.0624
1,3,5-Trimethylbenzene	5.00	0.0143	0.0624
Light Aromatic Naphtha	30.00	0.0855	0.3745
Methanol (TAP)	30.00	0.0855	0.3745
Other VOCs	20.00	0.0570	0.2497
Total Weight Percent:	100.00		
Total TAP Emissions		0.09	0.37
Total VOC Emissions		**0.29**	**1.25**
Total Non VOC & Non TAP-HC		0.00	0.00
Total Emissions		0.29	1.25

**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)**
90,000.00		8,760	0.88	75.40	330.26
Emission Factors*					
A_1	*A_2*	*A_5*	*A_6*	*Throughput (lb)*	*City Factor*
34	*1*	*34*	*1*	*50,000*	*1.31*
A_1 (lb/yr) = 588.40		A_2 (lb/yr) = 17.31		A_5 (lb/yr) = 588.40	A_6 (lb/yr) = 17.31
				Total ΣTPY=	0.61

POLLUTANT:**	**Weight Percent**	**CALCULATED EMISSION RATES**	
		Hourly (lb/hr)	**Annual (TPY)**
1,2,4-Trimethylbenzene	10.00	0.0138	0.0606
1,2,3-Trimethylbenzene	5.00	0.0069	0.0303
1,3,5-Trimethylbenzene	5.00	0.0069	0.0303
Light Aromatic Naphtha	20.00	0.0277	0.1211
Xylenes (TAP)	50.00	0.0691	0.3029
Ethylbenzene (TAP)	10.00	0.0138	0.0606
Total Weight Percent:	100.00		
Total TAP Emissions		0.08	0.36
Total VOC Emissions		**0.14**	**0.61**
Total Non VOC & Non TAP-HC		0.00	0.00
Total Emissions		0.14	0.61

**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)**
90,000.00	8,760	0.925	79.26	347.15

Emission Factors*

A_1	A_2	A_5	A_6	*Throughput (lb)*	*City Factor*
34	*1*	*34*	*1*	*50,000*	*1.31*

A_1 (lb/yr) = 618.49 A_2 (lb/yr) = 18.19 A_5 (lb/yr) = 618.49 A_6 (lb/yr) = 18.19

Total ΣTPY= 0.64

POLLUTANT:**	**Weight Percent**	**CALCULATED EMISSION RATES**	
		Hourly (lb/hr)	**Annual (TPY)**
1,2,4-Trimethylbenzene	18.00	0.0262	0.1146
1,2,3-Trimethylbenzene	3.00	0.0044	0.0191
1,3,5-Trimethylbenzene	3.00	0.0044	0.0191
Light Aromatic Naphtha	18.00	0.0262	0.1146
Polymer	37.00	0.0538	0.2356
Triethylenetetramine	3.00	0.0044	0.0191
Toluene (TAP)	18.00	0.0262	0.1146
Total Weight Percent:	100.00		
Total TAP Emissions		0.03	0.11
Total VOC Emissions		**0.15**	**0.64**
Total Non VOC & Non TAP-HC		0.00	0.00
Total Emissions		0.15	0.64

**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)**
720,050	8,760	1.7685	1212.35	5310.11

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) = 9452.15 A_2 (lb/yr) = 155.82 A_5 (lb/yr) = 3,134.49 A_6 (lb/yr) = 154.43

Total ΣTPY= 6.45

POLLUTANT:**	**Weight Percent**	**CALCULATED EMISSION RATES**	
		Hourly (lb/hr)	**Annual (TPY)**
Methane (excluded from VOC total)	6.20	0.0913	0.3998
Ethane (excluded from VOC total)	5.60	0.0824	0.3611
Carbon Dioxide (excluded from VOC total)	0.00	0.0000	0.0000
Hydrogen Sulfide (excluded from VOC total)	0.00	0.0000	0.0000
Propane	17.60	0.2591	1.1349
Iso-Butane	1.50	0.0221	0.0967
N-Butane	27.10	0.3990	1.7475

Iso-Pentane	1.50	0.0221	0.0967
N-Pentane	14.60	0.2149	0.9415
Heptanes	9.20	0.1354	0.5933
Octane	6.90	0.1016	0.4449
Other NM/NE Hydrocarbons	1.80	0.0265	0.1161
N-Hexane (TAP)	7.90	0.1163	0.5094
Benzene (TAP)	0.10	0.0015	0.0064
Total Weight Percent:	100.00		
Total TAP Emissions		0.12	0.52
Total VOC Emissions		**1.30**	**5.69**
Total Non VOC & Non TAP-HC		0.17	0.76
Total Emissions		1.47	6.45

**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.

Uncontrolled VOC Emission Total (TPY)	Storage Vapors + Blending Emissions	=	**11.22**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***32-13-LH-BS***

EMISSION SOURCE DESCRIPTION: ***3.5 MMBTU/Hr Line Heater-Burner Stack (H-108)***

DATA:

Emission Source:	***External Combustion Burner***
Hours of Operation:	***8760***
Maximum Burner Rating (MMBTU/Hr):	***3.5***
Fuel Gas Heat of Combustion (BTU/scf): *(based on an actual fuel gas analysis)*	***1007***
Sulfur Concentration of Fuel Gas (ppmv): *(conservative estimate)*	***7***
Fuel Source:	***Natural Gas***

Max. Hourly Fuel Consumption (SCFH): = burner rating/fuel gas heat of combustion/80% efficiency = ***4,344.59***

Max. Annual Fuel Consumption (MSCF/Yr): = hourly fuel consumption x hours = ***38,058.61***

EMISSION FACTORS:

Unless otherwise noted, emission factors taken from EPA Publication AP-42, "Compilation of Air Pollution Emission Factors" - Natural Gas Combustion (Small Boilers). SO_2 emission factor based on 100% conversion of sulfur compounds in fuel gas, using H_2S fuel composition noted above.

EMISSION CALCULATIONS:

POLLUTANT:	EMISSION FACTOR ($LBS/10^6$ SCF)	CALCULATED EMISSION RATES:	
		Hourly (lb/hr)	Annual (TPY)
Particulate Matter (filterable + condensable)	7.6	0.0330	0.1446
Sulfur Dioxide	1.182	0.0051	0.0225
Nitrogen Oxides	100	0.4345	1.9029
Carbon Monoxide	84	0.3649	1.5985
Methane (excluded from VOC total)	2.3	0.0100	0.0438
VOC	5.5	0.0239	0.1047
TOC	11	0.0478	0.2093
2-Methylnaphthalene (TAP)	0.0000240	0.0000	0.0000
3-Methylchloranthrene (TAP)	0.0000018	0.0000	0.0000
7,12-Dimethylbenz(a)anthrancene (TAP)	0.0000160	0.0000	0.0000
Acenaphthene (TAP)	0.0000018	0.0000	0.0000
Acenaphthylene (TAP)	0.0000018	0.0000	0.0000
Anthracene (TAP)	0.0000024	0.0000	0.0000
Benz(a)anthracene (TAP)	0.0000018	0.0000	0.0000
Benzene (TAP)	0.0021000	0.0000	0.0000
Benzo(a)pyrene (TAP)	0.0000012	0.0000	0.0000
Benzo(b)fluoranthene (TAP)	0.0000018	0.0000	0.0000

POLLUTANT:	EMISSION FACTOR (LBS/10^6 SCF)	CALCULATED EMISSION RATES:	
		Hourly (lb/hr)	Annual (TPY)
Benzo(g,h,I)perylene (TAP)	0.0000012	0.0000	0.0000
Benzo(k)fluoranthene (TAP)	0.0000018	0.0000	0.0000
Chrysene (TAP)	0.0000018	0.0000	0.0000
Dibenzo(a,h)anthrancene (TAP)	0.0000012	0.0000	0.0000
Dichlorobenzene (TAP)	0.0012000	0.0000	0.0000
Fluorathene (TAP)	0.0000030	0.0000	0.0000
Fluorene (TAP)	0.0000028	0.0000	0.0000
Formaldehyde (TAP)	0.0750000	0.0003	0.0014
Hexane (TAP)	1.8000000	0.0078	0.0343
Indeno(1,2,3-cd)pyrene (TAP)	0.0000018	0.0000	0.0000
Naphthalene (TAP)	0.0006100	0.0000	0.0000
Phenanathrene (TAP)	0.0000170	0.0000	0.0000
Pyrene (TAP)	0.0000050	0.0000	0.0000
Toluene (TAP)	0.0034000	0.0000	0.0001
Arsenic (TAP)	0.0002000	0.0000	0.0000
Beryllium (TAP)	0.0000120	0.0000	0.0000
Cadmium (TAP)	0.0011000	0.0000	0.0000
Chromium (TAP)	0.0014000	0.0000	0.0000
Cobalt (TAP)	0.0000840	0.0000	0.0000
Manganese (TAP)	0.0003800	0.0000	0.0000
Mercury (TAP)	0.0002600	0.0000	0.0000
Nickel (TAP)	0.0021000	0.0000	0.0000
Selenium (TAP)	0.0000240	0.0000	0.0000
Total TAPs		0.01	0.04
Total VOC-TAPs		0.01	0.04
Total Non VOC & Non TAP-HC		0.01	0.04
Total VOC		**0.02**	**0.10**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***33-13-HT-BS***

EMISSION SOURCE DESCRIPTION: ***500 MBTU/Hr Heater Treater-Burner Stack (V-118)***

DATA:

Emission Source:	***External Combustion Burner***
Hours of Operation:	***8760***
Maximum Burner Rating (MMBTU/Hr):	***0.500***
Fuel Gas Heat of Combustion (BTU/scf): *(based on an actual fuel gas analysis)*	***1007***
Sulfur Concentration of Fuel Gas (ppmv): *(conservative estimate)*	***7***
Fuel Source:	***Natural Gas***

Max. Hourly Fuel Consumption (SCFH): = burner rating/fuel gas heat of combustion/80% efficiency = ***620.66***

Max. Annual Fuel Consumption (MSCF/Yr): = hourly fuel consumption x hours = ***5,436.98***

EMISSION FACTORS:

Unless otherwise noted, emission factors taken from EPA Publication AP-42, "Compilation of Air Pollution Emission Factors" - Natural Gas Combustion (Small Boilers). SO_2 emission factor based on 100% conversion of sulfur compounds in fuel gas, using H_2S fuel composition noted above.

EMISSION CALCULATIONS:

POLLUTANT:	EMISSION FACTOR ($LBS/10^6$ SCF)	CALCULATED EMISSION RATES:	
		Hourly (lb/hr)	Annual (TPY)
Particulate Matter (filterable + condensable)	7.6	0.0047	0.0207
Sulfur Dioxide	1.182	0.0007	0.0032
Nitrogen Oxides	100	0.0621	0.2718
Carbon Monoxide	84	0.0521	0.2284
Methane (excluded from VOC total)	2.3	0.0014	0.0063
VOC	5.5	0.0034	0.0150
TOC	11	0.0068	0.0299
2-Methylnaphthalene (TAP)	0.0000240	0.0000	0.0000
3-Methylchloranthrene (TAP)	0.0000018	0.0000	0.0000
7,12-Dimethylbenz(a)anthrancene (TAP)	0.0000160	0.0000	0.0000
Acenaphthene (TAP)	0.0000018	0.0000	0.0000
Acenaphthylene (TAP)	0.0000018	0.0000	0.0000
Anthracene (TAP)	0.0000024	0.0000	0.0000
Benz(a)anthracene (TAP)	0.0000018	0.0000	0.0000
Benzene (TAP)	0.0021000	0.0000	0.0000
Benzo(a)pyrene (TAP)	0.0000012	0.0000	0.0000
Benzo(b)fluoranthene (TAP)	0.0000018	0.0000	0.0000

POLLUTANT:	EMISSION FACTOR (LBS/10^6 SCF)	CALCULATED EMISSION RATES:	
		Hourly (lb/hr)	Annual (TPY)
Benzo(g,h,I)perylene (TAP)	0.0000012	0.0000	0.0000
Benzo(k)fluoranthene (TAP)	0.0000018	0.0000	0.0000
Chrysene (TAP)	0.0000018	0.0000	0.0000
Dibenzo(a,h)anthrancene (TAP)	0.0000012	0.0000	0.0000
Dichlorobenzene (TAP)	0.0012000	0.0000	0.0000
Fluorathene (TAP)	0.0000030	0.0000	0.0000
Fluorene (TAP)	0.0000028	0.0000	0.0000
Formaldehyde (TAP)	0.0750000	0.0000	0.0002
Hexane (TAP)	1.8000000	0.0011	0.0049
Indeno(1,2,3-cd)pyrene (TAP)	0.0000018	0.0000	0.0000
Naphthalene (TAP)	0.0006100	0.0000	0.0000
Phenanathrene (TAP)	0.0000170	0.0000	0.0000
Pyrene (TAP)	0.0000050	0.0000	0.0000
Toluene (TAP)	0.0034000	0.0000	0.0000
Arsenic (TAP)	0.0002000	0.0000	0.0000
Beryllium (TAP)	0.0000120	0.0000	0.0000
Cadmium (TAP)	0.0011000	0.0000	0.0000
Chromium (TAP)	0.0014000	0.0000	0.0000
Cobalt (TAP)	0.0000840	0.0000	0.0000
Manganese (TAP)	0.0003800	0.0000	0.0000
Mercury (TAP)	0.0002600	0.0000	0.0000
Nickel (TAP)	0.0021000	0.0000	0.0000
Selenium (TAP)	0.0000240	0.0000	0.0000
Total TAPs		0.00	0.01
Total VOC-TAPs		0.00	0.01
Total Non VOC & Non TAP-HC		0.00	0.01
Total VOC		**0.00**	**0.01**

Emission Calculations

This is a sample calculation for EPNs: 34a-13-LH-BS & 34b-13-LH-BS.

POINT SOURCE I.D. NUMBER: ***"See Above"***

EMISSION SOURCE DESCRIPTION: ***30 MMBTU/Hr Line Heater-Burner Stack (H-104A/B)***

DATA:

Emission Source:	***External Combustion Burner***
Hours of Operation:	***8760***
Maximum Burner Rating (MMBTU/Hr):	***30***
Fuel Gas Heat of Combustion (BTU/scf): *(based on an actual fuel gas analysis)*	***1007***
Sulfur Concentration of Fuel Gas (ppmv): *(conservative estimate)*	***7***
Fuel Source:	***Natural Gas***

Max. Hourly Fuel Consumption (SCFH): = burner rating/fuel gas heat of combustion/80% efficiency = ***37,239.32***

Max. Annual Fuel Consumption (MSCF/Yr): = hourly fuel consumption x hours = ***326,216.44***

EMISSION FACTORS:

Unless otherwise noted, emission factors taken from EPA Publication AP-42, "Compilation of Air Pollution Emission Factors" - Natural Gas Combustion (Small Boilers). SO_2 emission factor based on 100% conversion of sulfur compounds in fuel gas, using H_2S fuel composition noted above.

EMISSION CALCULATIONS:

POLLUTANT:	EMISSION FACTOR ($LBS/10^6$ SCF)	CALCULATED EMISSION RATES:	
		Hourly (lb/hr)	Annual (TPY)
Particulate Matter (filterable + condensable)	7.6	0.2830	1.2396
Sulfur Dioxide	1.182	0.0440	0.1927
Nitrogen Oxides	100	3.7239	16.3108
Carbon Monoxide	84	3.1281	13.7011
Methane (excluded from VOC total)	2.3	0.0857	0.3751
VOC	5.5	0.2048	0.8971
TOC	11	0.4096	1.7942
2-Methylnaphthalene (TAP)	0.0000240	0.0000	0.0000
3-Methylchloranthrene (TAP)	0.0000018	0.0000	0.0000
7,12-Dimethylbenz(a)anthrancene (TAP)	0.0000160	0.0000	0.0000
Acenaphthene (TAP)	0.0000018	0.0000	0.0000
Acenaphthylene (TAP)	0.0000018	0.0000	0.0000
Anthracene (TAP)	0.0000024	0.0000	0.0000
Benz(a)anthracene (TAP)	0.0000018	0.0000	0.0000
Benzene (TAP)	0.0021000	0.0001	0.0003
Benzo(a)pyrene (TAP)	0.0000012	0.0000	0.0000

POLLUTANT:	EMISSION FACTOR (LBS/10^6 SCF)	CALCULATED EMISSION RATES:	
		Hourly (lb/hr)	Annual (TPY)
Benzo(b)fluoranthene (TAP)	0.0000018	0.0000	0.0000
Benzo(g,h,I)perylene (TAP)	0.0000012	0.0000	0.0000
Benzo(k)fluoranthene (TAP)	0.0000018	0.0000	0.0000
Chrysene (TAP)	0.0000018	0.0000	0.0000
Dibenzo(a,h)anthrancene (TAP)	0.0000012	0.0000	0.0000
Dichlorobenzene (TAP)	0.0012000	0.0000	0.0002
Fluorathene (TAP)	0.0000030	0.0000	0.0000
Fluorene (TAP)	0.0000028	0.0000	0.0000
Formaldehyde (TAP)	0.0750000	0.0028	0.0122
Hexane (TAP)	1.8000000	0.0670	0.2936
Indeno(1,2,3-cd)pyrene (TAP)	0.0000018	0.0000	0.0000
Naphthalene (TAP)	0.0006100	0.0000	0.0001
Phenanathrene (TAP)	0.0000170	0.0000	0.0000
Pyrene (TAP)	0.0000050	0.0000	0.0000
Toluene (TAP)	0.0034000	0.0001	0.0006
Arsenic (TAP)	0.0002000	0.0000	0.0000
Beryllium (TAP)	0.0000120	0.0000	0.0000
Cadmium (TAP)	0.0011000	0.0000	0.0002
Chromium (TAP)	0.0014000	0.0001	0.0002
Cobalt (TAP)	0.0000840	0.0000	0.0000
Manganese (TAP)	0.0003800	0.0000	0.0001
Mercury (TAP)	0.0002600	0.0000	0.0000
Nickel (TAP)	0.0021000	0.0001	0.0003
Selenium (TAP)	0.0000240	0.0000	0.0000
Total TAPs		0.07	0.31
Total VOC-TAPs		0.07	0.31
Total Non VOC & Non TAP-HC		0.09	0.38
Total VOC		**0.20**	**0.90**

Emission Calculations

This is a sample calculation for EPNs: 35a-13-WST-CV & 35b-13-WST-CV.

POINT SOURCE I.D. NUMBERS: ***"See Above"***

EMISSION SOURCE DESCRIPTION: ***400 BBL Water Storage Tank-Common Vent (V-154A/B)***

DATA:

Emission Source:	***Water Storage Vapors ('Working' & 'Standing')***
Average Daily Water Throughput: **(Annual Average; BBLD/Tank - Qavg)**	***0***
Maximum Daily Water Throughput: **(BBLD/Tank - Q_{max})**	***0***
Average VOC Working Losses - L_W (l/yr):	***0.000***
Average VOC Standing Losses - L_S (lb/yr):	***29.916***
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	=	**0.00**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**0.00**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**0.02**

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; 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)	0.00	0.0000	0.0000	0.0000
Methane (excluded from VOC total)	6.20	0.0002	0.0002	0.0011
Ethane (excluded from VOC total)	5.60	0.0002	0.0002	0.0010
Propane	17.60	0.0007	0.0007	0.0030
Iso-Butane	1.50	0.0001	0.0001	0.0003
N-Butane	27.10	0.0010	0.0010	0.0046
Iso-Pentane	1.50	0.0001	0.0001	0.0003
N-Pentane	14.60	0.0006	0.0006	0.0025
Heptane	9.20	0.0004	0.0004	0.0016
Octane	6.90	0.0003	0.0003	0.0012
Other NM/NE Hydrocarbons	1.80	0.0001	0.0001	0.0003

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
N-Hexane (TAP)	7.90	0.0003	0.0003	0.0013
Benzene (TAP)	0.10	0.0000	0.0000	0.0000
Total Weight Percent:	100.00			
Total TAP Emissions		0.00	0.00	0.00
Total VOC Emissions		**0.00**	**0.00**	**0.01**
Total Non VOC & Non TAP-HC		0.00	0.00	0.00
Total Hydrocarbon Emissions		0.00	0.00	0.02

VOC Emission Total (TPY)	=	Storage Vapors	=	**0.01**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***36-13-GST***

EMISSION SOURCE DESCRIPTION: ***100 BBL Glycol Storage Tank (V-136)***

DATA:

Emission Source:	***"Working" & "Standing" Losses***
Maximum Throughput: **(Gallons/Year)**	***10,000***
Average VOC Working Losses - L_w (lb/yr):	***51.703***
Average VOC Standing Losses - L_S (lb/yr):	***546.334***
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	=	**0.07**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**0.30**

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 approximately 4,200 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.

Emission Calculations

POINT SOURCE I.D. NUMBER: *37-13-CST*

EMISSION SOURCE DESCRIPTION: *10 - Organic Chemical Blend Storage Tanks (≤ 550 Gallons)*

DATA:

Emission Source:	***"Working" & "Standing" Losses***
Maximum Throughput: **(Gallons/Year/Tank)**	***2,000***
Maximum VOC Working Losses - L_w (lb/yr) per Tank:	***10.414***
Total Maximum VOC Working Losses - L_w (lb/yr):	***104.140***
Maximum VOC Standing Losses - L_S (lb/yr) per Tank:	***80.289***
Total Maximum VOC Breathing Losses - L_S (lb/yr):	***802.890***
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**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**0.45**

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 approximately 550 gallons and an annual throughput of approximately 2,000 gallons per tank were used in the emissions model in an effort to demonstrate a conservative potential emissions estimate.

Emission Calculations

POINT SOURCE I.D. NUMBER: ***38-13-CST***

EMISSION SOURCE DESCRIPTION: ***Organic Chemical Blend Storage Tank (≤ 2,000 Gallons)***

DATA:

Emission Source:	***"Working" & "Standing" Losses***
Maximum Throughput: **(Gallons/Year)**	***210,000***
Average VOC Working Losses - L_W (lb/yr):	***500.390***
Average VOC Standing Losses - L_S (lb/yr):	***271.976***
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	=	**0.09**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**0.39**

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 approximately 2,000 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.

Emission Calculations

POINT SOURCE I.D. NUMBER: ***39-13-CST***

EMISSION SOURCE DESCRIPTION: ***5 - Organic Chemical Blend Storage Tanks (≤ 800 Gallons)***

DATA:

Emission Source:	***"Working" & "Standing" Losses***
Maximum Throughput: **(Gallons/Year/Tank)**	***42,000***
Maximum VOC Working Losses - L_w (lb/yr) per Tank:	***165.161***
Total Maximum VOC Working Losses - L_w (lb/yr):	***825.805***
Maximum VOC Standing Losses - L_S (lb/yr) per Tank:	***118.110***
Total Maximum VOC Standing Losses - L_S (lb/yr):	***590.550***
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	=	**0.16**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**0.71**

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 approximately 800 gallons and an annual throughput of approximately 3,000 gallons per tank were used in the emissions model in an effort to demonstrate a conservative potential emissions estimate.

Emission Calculations

POINT SOURCE I.D. NUMBER: ***42-14-DST***

EMISSION SOURCE DESCRIPTION: ***1000 Gallon Diesel Storage Tank***

DATA:

Emission Source:	***"Working" & "Standing" Losses***
Maximum Throughput: **(Gallons/Year)**	***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 No. 2 fuel oil (diesel) as the stored material for this tank. A tank size of 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.

Emission Calculations

POINT SOURCE I.D. NUMBER: ***43-14-GST***

EMISSION SOURCE DESCRIPTION: ***1000 Gallon Gasoline Storage Tank***

DATA:

Emission Source:	***"Working" & "Standing" Losses***
Maximum Gasoline Throughput: **(Gallons/Year)**	***9,000***
Average VOC Working Losses - L_W (lb/yr):	***112.590***
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)	=	(Ls + (Lw * Q_{Max} ÷ Q_{avg}))/8760	=	**0.10**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**0.43**

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	0.0003
Propane	1.25	0.0012	0.0012	0.0054
N-Butane	22.95	0.0227	0.0227	0.0995
Iso-Butane	9.83	0.0097	0.0097	0.0426
N-Pentane	8.56	0.0085	0.0085	0.0371
N-Hexane (TAP)	1.84	0.0018	0.0018	0.0080
Heptane	0.32	0.0003	0.0003	0.0014
Octane	0.02	0.0000	0.0000	0.0001
Cyclopentane	0.72	0.0007	0.0007	0.0031
Cyclohexanes	1.65	0.0016	0.0016	0.0072
2,2,4-Trimethylpentane (TAP)	0.49	0.0005	0.0005	0.0021
Methylcyclohexanes	0.24	0.0002	0.0002	0.0010
Methylcyclopentane	1.66	0.0016	0.0016	0.0072
Cyclopentene	0.25	0.0002	0.0002	0.0011
Benzene (TAP)	0.77	0.0008	0.0008	0.0033
Toluene (TAP)	0.66	0.0007	0.0007	0.0029
Ethylbenzene (TAP)	0.04	0.0000	0.0000	0.0002

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Xylenes (mixed isomers) (TAP)	0.20	0.0002	0.0002	0.0009
Other Hexanes	8.35	0.0083	0.0083	0.0362
Other Heptanes	2.53	0.0025	0.0025	0.0110
Other Octanes	0.33	0.0003	0.0003	0.0014
Other Butenes	3.30	0.0033	0.0033	0.0143
Other Pentanes	33.58	0.0332	0.0332	0.1456
Other VOCs (Non-TAP)	0.37	0.0004	0.0004	0.0016
Total Weight Percent:	100.00			
Total TAP Emissions		0.00	0.00	0.02
Total VOC Emissions		**0.10**	**0.10**	**0.43**
Total Non VOC & Non TAP-HC		0.00	0.00	0.00
Total Hydrocarbon Emissions		0.10	0.10	0.43

Emission Calculations

POINT SOURCE I.D. NUMBER: ***44-15-LP-RG***

EMISSION SOURCE DESCRIPTION: ***Low Pressure-Relief Gas (AA-101)***

DATA:

Emission Source:	***Low Pressure Relief Gas***
Gas Specific Gravity:	***1.571***
Maximum Annual Vent Rate (MSCF):	***3500***
Basis of Emission Estimates:	***Actual Flash Gas Analysis***
Well Gas Analysis Report Number:	***Southern Petroleum Laboratories Report No.: 13110169-005A***

Avg. Hourly Uncontrolled Total Emissions (lb/hr)	=	Gas Gravity * Density of Air * Hourly Gas Rate	=	**47.95**
Max. Hourly Uncontrolled Total Emissions (lb/hr)	=	Gas Gravity * Density of Air * Hourly Gas Rate	=	**47.95**
Annual Hydrocarbon Emissions (TPY)	=	Hourly * 8760/2000	=	**210.02**

SPECIATION FACTORS:

Speciation of the well gas relief is based on the referenced analysis.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.000	0.0000	0.0000	0.0000
Carbon Dioxide (excluded from VOC total)	87.760	42.0849	42.0849	184.3144
Methane (excluded from VOC total)	0.237	0.1137	0.1137	0.4977
Ethane (excluded from VOC total)	0.840	0.4028	0.4028	1.7642
Hydrogen Sulfide (excluded from VOC total)	0.000	0.0000	0.0000	0.0000
Propane	1.964	0.9418	0.9418	4.1248
Iso-Butane	0.913	0.4378	0.4378	1.9175
N-Butane	2.811	1.3480	1.3480	5.9037
Iso-Pentane	1.597	0.7658	0.7658	3.3540
N-Pentane	1.392	0.6675	0.6675	2.9235
Iso-Hexane	0.000	0.0000	0.0000	0.0000
N-Hexane (TAP)	0.904	0.4335	0.4335	1.8986
Methylcyclopentane	0.000	0.0000	0.0000	0.0000
Benzene (TAP)	0.170	0.0815	0.0815	0.3570
Cyclohexane	0.000	0.0000	0.0000	0.0000
Heptanes	0.733	0.3515	0.3515	1.5395
Methylcyclohexane	0.000	0.0000	0.0000	0.0000
Toluene (TAP)	0.050	0.0240	0.0240	0.1050
2,2,4-Trimethylpentane (TAP)	0.000	0.0000	0.0000	0.0000
Octanes	0.238	0.1143	0.1143	0.5007

Ethylbenzene (TAP)	0.005	0.0026	0.0026	0.0113
Xylenes (TAP)	0.025	0.0120	0.0120	0.0525
Nonanes	0.049	0.0235	0.0235	0.1029
Decanes Plus	0.311	0.1491	0.1491	0.6532
Total Weight Percent:	100.000			
Total TAP Emissions		0.55	0.55	2.42
Total VOC Emissions		**5.35**	**5.35**	**23.44**
Total Non VOC & Non TAP-HC		0.52	0.52	2.26
Total Emissions		47.95	47.95	210.02

Uncontrolled VOC Emission Total (TPY)	Low Pressure Relief Gas	=	**23.44**

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
Maria C. Guedez 5851 Legacy Circle, Suite 1200 Plano, TX 75024	Vice President
Thomas E. Boelens 5851 Legacy Circle, Suite 1200 Plano, TX 75024	Vice President
Dan E. Cole 5851 Legacy Circle, Suite 1200 Plano, TX 75024	Vice President
Kevin L. Dahncke 5851 Legacy Circle, Suite 1200 Plano, TX 75024	Vice President
Scott Henderson 5851 Legacy Circle, Suite 1200 Plano, TX 75024	Vice President
Kwanchanok Methawattanakul 5851 Legacy Circle, Suite 1200 Plano, TX 75024	Vice President
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

Certificate of Analysis

Number: 2030-13110169-001A

Carencro Laboratory
4790 NE Evangeline Thruway
Carencro, LA 70520

Nov. 27, 2013

Denbury Resources
5320 Legacy Drive
Plano, TX 75024

Field: Mallalieu
Station Name: Purchase Gas/Fuel
Sample Point: Sample Valve
Cylinder No: 2334
Analyzed: 11/18/2013 03:41:45 by GR

Sampled By: JB-FSC
Sample Of: Gas Spot
Sample Date: 11/05/2013
Sample Conditions: 120 psig, @ 75 °F
Method: GPA 2286

Analytical Data

Components	Mol. %	Wt. %	GPM at 15.025 psia
Nitrogen	1.382	2.276	
Carbon Dioxide	1.553	4.019	
Methane	95.024	89.635	
Ethane	1.786	3.158	0.488
Propane	0.133	0.345	0.038
Iso-butane	0.021	0.072	0.007
n-Butane	0.026	0.089	0.008
Iso-pentane	0.010	0.042	0.004
n-Pentane	0.007	0.030	0.003
Hexanes Plus	0.058	0.334	0.021
	100.000	100.000	0.569

GPM TOTAL C2+	0.569
GPM TOTAL C3+	0.081
GPM TOTAL IC5+	0.028

Physical Properties	Total	C6+
Relative Density Real Gas	0.5882	3.3951
Calculated Molecular Weight	17.01	98.33
Compressibility Factor	0.9979	
GPA 2172-09 Calculation:		
Calculated Gross BTU per ft³ @ 15.025 psia & 60°F		
Real Gas Dry BTU	1025	5353
Water Sat. Gas Base BTU	1007	5262

Hydrocarbon Laboratory Manager

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

Certificate of Analysis

Number: 2030-13110169-001A

Carencro Laboratory
4790 NE Evangeline Thruway
Carencro, LA 70520

Nov. 27, 2013

Denbury Resources
5320 Legacy Drive
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Sample Point: Sample Valve
Cylinder No: 2334
Analyzed: 11/18/2013 03:41:45 by GR

Sampled By: JB-FSC
Sample Of: Gas Spot
Sample Date: 11/05/2013
Sample Conditions: 120 psig, @ 75 °F
Method: GPA 2286

Analytical Data

Components	Mol. %	Wt. %	GPM at 15.025 psia		
Nitrogen	1.382	2.276		GPM TOTAL C2+	0.569
Carbon Dioxide	1.553	4.019		GPM TOTAL C3+	0.081
Methane	95.024	89.635		GPM TOTAL iC5+	0.028
Ethane	1.786	3.156	0.488		
Propane	0.133	0.345	0.036		
Iso-Butane	0.021	0.072	0.007		
n-Butane	0.026	0.089	0.008		
Iso-Pentane	0.010	0.042	0.004		
n-Pentane	0.007	0.030	0.003		
Hexanes	0.022	0.098	0.007		
Heptanes Plus	0.036	0.236	0.014		
	100.000	100.000	0.569		

Physical Properties	Total	C7+
Relative Density Real Gas	0.5882	3.5648
Calculated Molecular Weight	17.01	103.24
Compressibility Factor	0.9979	
GPA 2172-09 Calculation:		
Calculated Gross BTU per ft³ @ 15.025 psia & 60°F		
Real Gas Dry BTU	1025	5560
Water Sat. Gas Base BTU	1007	5465

Hydrocarbon Laboratory Manager

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

Certificate of Analysis

Number: 2030-13110169-001A

Carencro Laboratory
4790 NE Evangeline Thruway
Carencro, LA 70520

Nov. 27, 2013

Denbury Resources
5320 Legacy Drive
Plano, TX 75024

Field: Mallalieu
Station Name: Purchase Gas/Fuel
Sample Point: Sample Valve
Cylinder No: 2334
Analyzed: 11/18/2013 03:41:45 by GR

Sampled By: JB-FSC
Sample Of: Gas Spot
Sample Date: 11/05/2013
Sample Conditions: 120 psig, @ 75 °F
Method: GPA 2286

Analytical Data

Components	Mol. %	Wt. %	GPM at 15.025 psia		
Nitrogen	1.382	2.276		GPM TOTAL C2+	0.569
Carbon Dioxide	1.553	4.019			
Methane	95.024	89.635			
Ethane	1.786	3.158	0.488		
Propane	0.133	0.345	0.038		
Iso-Butane	0.021	0.072	0.007		
n-Butane	0.026	0.089	0.008		
Iso-Pentane	0.010	0.042	0.004		
n-Pentane	0.007	0.030	0.003		
i-Hexanes	0.015	0.059	0.004		
n-Hexane	0.007	0.039	0.003		
Benzene	0.010	0.042	0.002		
Cyclohexane	0.002	0.008	0.001		
i-Heptanes	0.009	0.065	0.004		
n-Heptane	0.005	0.031	0.002		
Toluene	0.002	0.016	0.001		
i-Octanes	0.005	0.055	0.003		
n-Octane	0.002	0.013	0.001		
Ethylbenzene	NIL	NIL	NIL		
Xylenes	NIL	NIL	NIL		
i-Nonanes	NIL	NIL	NIL		
n-Nonane	0.001	0.006	NIL		
Decane Plus	NIL	NIL	NIL		
	100.000	100.000	0.569		

Physical Properties	Total	C10+
Calculated Molecular Weight	17.01	153.65
GPA 2172-09 Calculation:		
Calculated Gross BTU per ft³ @ 15.025 psia & 60°F		
Real Gas Dry BTU	1024.5	8320.7
Water Sat. Gas Base BTU	1007	8178.8
Relative Density Real Gas	0.5882	5.3252
Compressibility Factor	0.9979	

Hydrocarbon Laboratory Manager

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

CAS No.	Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
129-00-0	Pyrene[b, c]	5.0E-06	E
108-88-3	Toluene[b]	3.4E-03	C

[a] Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. Data are for all natural gas combustion sources. To convert from $lb/10^6$ scf to $kg/10^6$ m^3, multiply by 16. To convert from $1b/10^6$ scf to lb/MMBtu, divide by 1,020. Emission Factors preceeded with a less-than symbol are based on method detection limits.

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

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

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

TABLE 1.4-4. EMISSION FACTORS FOR METALS FROM NATURAL GAS COMBUSTION[a]

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

[a] Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. Data are for all natural gas combustion sources. Emission factors preceeded by a less-than symbol are based on method detection limits. To convert from $lb/10^6$ scf to $kg/10^6$ m^3, multiply by l6. To convert from $lb/10^6$ scf to 1b/MMBtu, divide by 1,020.

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

References For Section 1.4

1. *Exhaust Gases From Combustion And Industrial Processes*, EPA Contract No. EHSD 71-36, Engineering Science, Inc., Washington, DC, October 1971.

2. *Chemical Engineers' Handbook, Fourth Edition*, J. H. Perry, Editor, McGraw-Hill Book Company, New York, NY, 1963.

3. *Background Information Document For Industrial Boilers*, EPA-450/3-82-006a, U. S. Environmental Protection Agency, Research Triangle Park, NC, March 1982.

4. *Background Information Document For Small Steam Generating Units*, EPA-450/3-87-000, U. S . Environmental Protection Agency, Research Triangle Park, NC, 1987.

5. J. L. Muhlbaier, "Particulate and Gaseous Emissions From Natural Gas Furnaces and Water Heaters", *Journal Of The Air Pollution Control Association*, December 1981.

6. L. P. Nelson, *et al., Global Combustion Sources Of Nitrous Oxide Emissions*, Research Project 2333-4 Interim Report, Sacramento: Radian Corporation, 1991.

7. R. L. Peer, *et al., Characterization Of Nitrous Oxide Emission Sources*, Prepared for the U. S. EPA Contract 68-D1-0031, Research Triangle Park, NC: Radian Corporation, 1995.

8. S. D. Piccot, *et al., Emissions and Cost Estimates For Globally Significant Anthropogenic Combustion Sources Of NO_x, N_2O, CH_4, CO, and CO_2*, EPA Contract No. 68-02-4288, Research Triangle Park, NC: Radian Corporation, 1990.

9. *Sector-Specific Issues and Reporting Methodologies Supporting the General Guidelines for the Voluntary Reporting of Greenhouse Gases under Section 1605(b) of the Energy Policy Act of 1992* (1994) DOE/PO-0028, Volume 2 of 3, U.S. Department of Energy.

10. J. P. Kesselring and W. V. Krill, "A Low-NO_x Burner For Gas-Fired Firetube Boilers", *Proceedings: 1985 Symposium On Stationary Combustion NO_x Control, Volume 2*, EPRI CS-4360, Electric Power Research Institute, Palo Alto, CA, January 1986.

11. *Emission Factor Documentation for AP-42 Section 1.4—Natural Gas Combustion*, Technical Support Division, Office of Air Quality Planning and Standards, U. S. Environmental Protection Agency, Research Triangle Park, NC, 1997.

12. *Alternate Control Techniques Document - NO_x Emissions from Utility Boilers*, EPA-453/R-94-023, U. S. Environmental Protection Agency, Research Triangle Park, NC, March 1994.

HOUSTON LABORATORIES
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

CERTIFICATE OF ANALYSIS

Certificate of Analysis Number: 13110659-001A

FOR:
Denbury Resources
Denbury Resources
5320 Legacy Drive

Plano, TX 76024

CUSTOMER:	Denbury Resources	**TYPE:**	SpotLiquid
FIELD :	Mallalieu	**REPORT:**	Flash Report
LOCATION :	EOR Last Vessel to Water Tank	**CYLINDER:**	28700
SAMPLE POINT:		**PRESSURE:**	200
REPORT DATE:	12/4/2013	**TEMPERATURE:**	78
SAMPLE DATE:	11/6/2013		
SAMPLED BY:	JB		

Comments: Pressurized water sample physically flashed and composition calculated.

Analytical Data

Parameters	Results	Units	Lab Tech.	Date Analyzed
Flash Factor	23.57	Ft^3 / bbl	GM / CS	12/4/2013
Flash Factor (Air Free)	23.48	Ft^3 / bbl	GM / CS	12/4/2013

Hydrocarbon Laboratory Manager

HOUSTON LABORATORIES
8820 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis Number: 13110659-001A

FOR: Denbury Resources
Denbury Resources
5320 Legacy Drive
Plano, TX 75024

CUSTOMER: Denbury Resources
LOCATION : EOR Last Vessel to Water Tank
SAMPLE POINT:
REPORT DATE: 12/6/2013
SAMPLE DATE: 11/6/2013
SAMPLED BY: JB
MEMO: Pressurized water sample physically flashed and composition calculated on an air free basis.

TYPE: Spot Liquid
REPORT: C10+ (GPA Method 2286)
CYLINDER: 28700
PRESSURE: 200
TEMPERATURE: 76

COMPONENT	MOL %	WEIGHT %	GPM's
HELIUM	NIL	NIL	
HYDROGEN	NIL	NIL	
OXYGEN/ARGON	NIL	NIL	
NITROGEN	0.368	0.234	
METHANE	0.143	0.052	
CARBON DIOXIDE	99.394	99.543	
ETHANE	0.013	0.009	0.004
PROPANE	0.009	0.009	0.002
I-BUTANE	0.002	0.002	0.000
N-BUTANE	0.003	0.005	0.001
I-PENTANE	0.001	0.002	0.001
N-PENTANE	0.001	0.002	0.001
I-HEXANES	0.002	0.002	0.001
N-HEXANE	0.001	0.002	NIL
BENZENE	0.032	0.057	0.007
CYCLOHEXANE	0.001	0.002	NIL
I-HEPTANES	0.002	0.004	0.001
N-HEPTANE	0.001	0.002	NIL
TOLUENE	0.013	0.028	0.004
I-OCTANES	0.003	0.006	0.002
N-OCTANE	0.001	0.002	NIL
*E-BENZENE	NIL	0.001	NIL
*m,o,&p-XYLENE	0.003	0.008	0.001
I-NONANES	NIL	0.004	0.001
N-NONANE	0.001	0.003	0.001
I-DECANES	0.002	0.015	0.003
N-DECANE	0.001	0.002	NIL
I-UNDECANES +	0.001	0.003	0.001
TOTALS	100.000	100.000	0.031

CALCULATED VALUES	TOTAL	C10+
Molecular Weight	43.946	140.156
Relative Density as a Vapor	1.5249	4.7962
Compressibility Factor	0.9943	N/A
HvID/Z (Btu/Ft.^{3}), Dry Basis at 15.025 Psia, 60°F	5.4	7466 *
HvID/Z (Btu/Ft.^{3}), Saturated at Base at 15.025 Psia, 60°F	5.2	7503 *

* Plus Fraction HvID (Btu, Ft.^{3})

HOUSTON LABORATORIES
5820 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis Number: 13110669-001A

FOR: Denbury Resources
Denbury Resources
5320 Legacy Drive
Plano, TX 75024

CUSTOMER:	Denbury Resources
LOCATION :	EOR Last Vessel to Water Tank
SAMPLE POINT:	
REPORT DATE:	12/6/2013
SAMPLE DATE:	11/6/2013
SAMPLED BY:	JB
MEMO:	Pressurized water sample physically flashed and composition calculated on an air free basis.

TYPE: Spot Liquid
REPORT: C10+ (GPA Method 2186)
CYLINDER: 26700
PRESSURE: 200
TEMPERATURE: 78

COMPONENT	MOL %	WEIGHT %	GPM's
HELIUM	NIL	NIL	
HYDROGEN	NIL	NIL	
OXYGEN/ARGON	NIL	NIL	
NITROGEN	0.368	0.234	
METHANE	0.143	0.052	
CARBON DIOXIDE	99.394	99.543	
ETHANE	0.013	0.009	0.004
PROPANE	0.009	0.009	0.002
I-BUTANE	0.002	0.002	0.000
N-BUTANE	0.003	0.005	0.001
I-PENTANE	0.001	0.002	0.001
N-PENTANE	0.001	0.002	0.001
HEXANES PLUS	0.064	0.141	0.022
TOTALS	100.000	100.000	0.031

CALCULATED VALUES	TOTAL	C6+
Molecular Weight	43.946	86.246
Relative Density as a Vapor	1.5249	3.3047
Compressibility Factor	0.9943	N/A
HvID/Z (Btu/Ft.^{3}), Dry Basis at 15.025 Psia, 60°F	6.4	4826 *
HvID/Z (Btu/Ft.^{3}), Saturated at Base at 15.025 Psia, 60°F	6.2	4849 *

* Plus Fraction HvID (Btu, Ft.^{3})

Hydrocarbon Laboratory Manager

HOUSTON LABORATORIES
8820 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis Number: 20140659-001A

FOR: Denbury Resources
Donbury Resources
5320 Legacy Drive
Plano, TX 75024

CUSTOMER:	Denbury Resources	**TYPE:**	SpotLiquid
LOCATION :	EOR Last Vessel to Water Tank	**REPORT:**	C10+ (GPA Method 2186)
SAMPLE POINT:		**CYLINDER:**	28700
REPORT DATE:	12/6/2013	**PRESSURE:**	200
SAMPLE DATE:	11/6/2013	**TEMPERATURE:**	78
SAMPLED BY:	JB		

MEMO: Pressurized water sample physically flashed and composition calculated on an air free basis.

COMPONENT	MOL %	WEIGHT %	LV %
HELIUM	NIL	NIL	
HYDROGEN	NIL	NIL	
OXYGEN/ARGON	NIL	NIL	
NITROGEN	0.368	0.234	
METHANE	0.143	0.052	
CARBON DIOXIDE	99.394	99.543	
ETHANE	0.013	0.009	0.004
PROPANE	0.009	0.009	0.002
I-BUTANE	0.002	0.002	0.000
N-BUTANE	0.003	0.005	0.001
I-PENTANE	0.001	0.002	0.001
N-PENTANE	0.001	0.002	0.001
HEXANES	0.003	0.004	0.001
HEPTANES PLUS	0.061	0.137	0.021
TOTALS	100.000	100.000	0.031

CALCULATED VALUES	TOTAL	C7+
Molecular Weight	43.846	96.82
Relative Density as a Vapor	1.5249	3.3220
Compressibility Factor	0.9943	N/A
HvID/Z (Btu/Ft.^{3}), Dry Basis at 15.025 Psia, 60°F	5.4	4833 *
HvID/Z (Btu/Ft.^{3}), Saturated at Base at 15.025 Psia, 60°F	5.2	4857 *

* Plus Fraction HvID (Btu, Ft.^{3})

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AMERICAN PETROLEUM INSTITUTE

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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

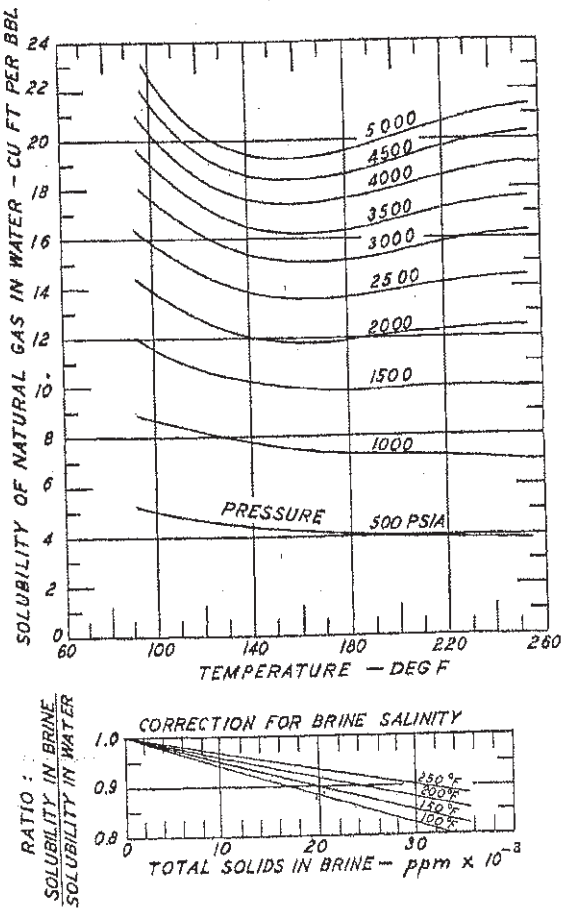
Formation Volumes of Pure Water and Mixtures of Natural Gas and Water

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	**5-05-OST-V**
Tank Description	**3000 BBL Wet Oil Tank-Vent (V-118A)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**29.70**
Vertical Height/Horizontal Length (H_S ft)	**24.10**
Roof Height (H_R ft)	**0.93**
Max Liquid Height (H_{LX} ft)	**23.10**
Avg Liquid Height (H_L ft)	**11.55**
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)	**0.58**
Roof Paint Solar Absorptance (R_A)	**0.58**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.3094**

Tank Shell Color/Shade	**Gray - Light**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Gray - Light**
Tank Roof Paint Condition	**average**
Roof Type	**vertical tank with cone roof**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**36,500.00**
Annual Turnovers, N	**12.80**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**16,003.49**
vapor space outage (H_{VO} ft)	**12.859**
vapor space volume (V_V ft^3)	**8,908.87**

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**	**40.9**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**40.9**
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			

	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)	48.11	51.86	59.38	67.57	76.11	82.62	85.03	84.52	78.74	67.70	56.70	49.26	67.30
average vapor temperature (T_V °F)	50.93	55.60	64.31	73.91	83.06	89.92	92.12	91.18	84.42	72.24	60.03	51.88	72.46
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)	23.04	27.15	31.42	36.12	36.73	37.35	36.14	35.31	32.98	30.88	26.69	23.02	31.33
daily average liquid surface temperature (T_{LA} °F)	49.52	53.73	61.85	70.74	79.58	86.27	88.57	87.85	81.58	69.97	58.37	50.57	69.88
daily maximum liquid surface temperature (T_{LX} °F)	55.28	60.52	69.70	79.77	88.76	95.61	97.61	96.68	89.83	77.69	65.04	56.33	77.71
daily minimum liquid surface temperature (T_{LN} °F)	43.76	46.94	53.99	61.71	70.40	76.93	79.54	79.02	73.34	62.25	51.69	44.82	62.04
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	3.151	3.417	3.982	4.683	5.474	6.139	6.382	6.305	5.667	4.619	3.731	3.215	4.611
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	3.520	3.885	4.597	5.492	6.403	7.172	7.410	7.298	6.518	5.297	4.223	3.590	5.299
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	2.813	2.995	3.434	3.972	4.655	5.227	5.470	5.421	4.906	4.012	3.286	2.872	3.997
daily vapor pressure range (ΔP_V)	0.7072	0.8893	1.1626	1.5201	1.7477	1.9447	1.9395	1.8768	1.6122	1.2848	0.9376	0.7182	1.3021
vapor space expansion factor (K_E)	0.1074	0.1329	0.1704	0.2224	0.2610	0.3000	0.3038	0.2925	0.2427	0.1878	0.1383	0.1086	0.1904
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	17,403	15,719	17,403	16,842	17,403	16,842	17,403	17,403	16,842	17,403	16,842	17,403	204,911
monthly turnovers (N/month) with avg = total annual	1.09	0.98	1.09	1.05	1.09	1.05	1.09	1.09	1.05	1.09	1.05	1.09	12.80
vented vapor saturation factor (K_S)	0.3177	0.3004	0.2693	0.2386	0.2114	0.1929	0.1869	0.1888	0.2057	0.2411	0.2822	0.3133	0.2414
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)	0.0287	0.0309	0.0354	0.0409	0.0470	0.0520	0.0539	0.0533	0.0485	0.0405	0.0335	0.0293	0.0404
standing storage losses (L_S lb/month & avg is lb/yr)	364.83	354.16	449.34	502.24	596.38	639.19	683.89	676.76	595.95	513.45	410.82	371.64	6158.65
working losses (L_W lb/month & avg is lb/yr)	375.25	364.28	462.19	516.59	613.42	657.46	703.44	696.10	612.98	528.12	422.56	382.26	6334.66
total losses (L_T lb/month & avg is lb/yr)	740.08	718.44	911.53	1018.83	1209.80	1296.65	1387.33	1372.87	1208.93	1041.57	833.38	753.91	12493.31
max hourly Q in bbl/hour	23.39	23.39	23.39	23.39	23.39	23.39	23.39	23.39	23.39	23.39	23.39	23.39	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.504	0.542	0.621	0.717	0.824	0.913	0.945	0.936	0.851	0.710	0.587	0.514	
breathing/standing loss (L_S lb/hr)	0.490	0.527	0.604	0.805	0.962	1.118	1.136	1.093	0.899	0.690	0.571	0.500	
max hourly total loss (L_T lb/hr)	0.995	1.069	1.225	1.523	1.787	2.031	2.081	2.029	1.750	1.400	1.157	1.013	

L_S sum months	L_W sum months	L_T sum months
6158.65	6334.66	12493.31

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	**0.689**	**1.136**	**6,033.096**
Working Loss L_W	**0.708**	**0.945**	**6,205.520**
Total Loss L_T	**1.397**	**2.081**	**12,238.617**

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	

Tank Emission Calculations Based on AP 42 Chapter 7 (June 2020, Section 7.1.3.1), Fixed Roof

Tank ID	**6-05-OST-V**
Tank Description	**3000 BBL Wet/Dry Oil Tank-Vent (V-119A)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**29.70**
Vertical Height/Horizontal Length (H_S ft)	**24.10**
Roof Height (H_R ft)	**0.93**
Max Liquid Height (H_{LX} ft)	**23.10**
Avg Liquid Height (H_L ft)	**11.55**
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)	**0.58**
Roof Paint Solar Absorptance (R_A)	**0.58**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.3094**

Tank Shell Color/Shade	**Gray - Light**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Gray - Light**
Tank Roof Paint Condition	**average**
Roof Type	**vertical tank with cone roof**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**547,500.00**
Annual Turnovers, N	**192.06**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**16,003.49**
vapor space outage (H_{VO} ft)	**12.859**
vapor space volume (V_V ft^3)	**8,908.87**

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**	**40.9**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**40.9**
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)	48.11	51.86	59.38	67.57	76.11	82.62	85.03	84.52	78.74	67.70	56.70	49.26	67.30
average vapor temperature (T_V °F)	50.93	55.60	64.31	73.91	83.06	89.92	92.12	91.18	84.42	72.24	60.03	51.88	72.46
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)	23.04	27.15	31.42	36.12	36.73	37.35	36.14	35.31	32.98	30.88	26.69	23.02	31.33
daily average liquid surface temperature (T_{LA} °F)	49.52	53.73	61.85	70.74	79.58	86.27	88.57	87.85	81.58	69.97	58.37	50.57	69.88
daily maximum liquid surface temperature (T_{LX} °F)	55.28	60.52	69.70	79.77	88.76	95.61	97.61	96.68	89.83	77.69	65.04	56.33	77.71
daily minimum liquid surface temperature (T_{LN} °F)	43.76	46.94	53.99	61.71	70.40	76.93	79.54	79.02	73.34	62.25	51.69	44.82	62.04
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	3.151	3.417	3.982	4.683	5.474	6.139	6.382	6.305	5.667	4.619	3.731	3.215	4.611
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	3.520	3.885	4.597	5.492	6.403	7.172	7.410	7.298	6.518	5.297	4.223	3.590	5.299
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	2.813	2.995	3.434	3.972	4.655	5.227	5.470	5.421	4.906	4.012	3.286	2.872	3.997
daily vapor pressure range (ΔP_V)	0.7072	0.8893	1.1626	1.5201	1.7477	1.9447	1.9395	1.8768	1.6122	1.2848	0.9376	0.7182	1.3021
vapor space expansion factor (K_E)	0.1074	0.1329	0.1704	0.2224	0.2610	0.3000	0.3038	0.2925	0.2427	0.1878	0.1383	0.1086	0.1904
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	261,051	235,788	261,051	252,630	261,051	252,630	261,051	261,051	252,630	261,051	252,630	261,051	3,073,665
monthly turnovers (N/month) with avg = total annual	16.31	14.73	16.31	15.79	16.31	15.79	16.31	16.31	15.79	16.31	15.79	16.31	192.06
vented vapor saturation factor (K_S)	0.3177	0.3004	0.2693	0.2386	0.2114	0.1929	0.1869	0.1888	0.2057	0.2411	0.2822	0.3133	0.2414
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)	0.0287	0.0309	0.0354	0.0409	0.0470	0.0520	0.0539	0.0533	0.0485	0.0405	0.0335	0.0293	0.0404
standing storage losses (L_S lb/month & avg is lb/yr)	364.83	354.16	449.34	502.24	596.38	639.19	683.89	676.76	595.95	513.45	410.82	371.64	6158.65
working losses (L_W lb/month & avg is lb/yr)	5628.80	5464.23	6932.81	7748.85	9201.32	9861.85	10551.59	10441.57	9194.70	7921.86	6338.41	5733.96	95019.94
total losses (L_T lb/month & avg is lb/yr)	5993.63	5818.39	7382.15	8251.09	9797.70	10501.04	11235.48	11118.33	9790.64	8435.31	6749.23	6105.60	101178.59
max hourly Q in bbl/hour	350.88	350.88	350.88	350.88	350.88	350.88	350.88	350.88	350.88	350.88	350.88	350.88	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	7.566	8.131	9.318	10.762	12.367	13.697	14.182	14.034	12.770	10.648	8.803	7.707	
breathing/standing loss (L_S lb/hr)	0.490	0.527	0.604	0.805	0.962	1.118	1.136	1.093	0.899	0.690	0.571	0.500	
max hourly total loss (L_T lb/hr)	8.056	8.658	9.922	11.568	13.330	14.815	15.318	15.127	13.670	11.338	9.374	8.206	

L_S sum months	L_W sum months	L_T sum months
6158.65	95019.94	101178.59

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	**0.689**	**1.136**	**6,033.096**
Working Loss L_W	**10.626**	**14.182**	**93,082.802**
Total Loss L_T	**11.315**	**15.318**	**99,115.898**

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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Flash Liberation of Hydrocarbon Liquid Study

Client:	Denbury	Sample Lab ID:	23080185-005A
Facility:	MS Mallalieu EOR Facility	Facility Well:	Not Indicated
Equipment:	Not Indicated	Sample Source:	Oil Treater Dump V105A
Unique Number:	Not Indicated	Analyst:	JMC
Date Sampled:	08/03/23	Date Analyzed:	08/23/23
State:	ND	Site Notes:	
County:	Not Indicated		

Flash Liberation of Hydrocarbon Liquid Conditions

	Pressure (psig)	Temperature (°F)
Separator Hydrocarbon Liquid	55.0	80.0
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	23.20	SCF flashed vapor/bbl stock tank oil
Gas Oil Ratio	2.757	lb flashed vapor/bbl stock tank oil
Gas Specific Gravity	1.554	Air = 1.000
Separator Volume Factor	1.022	Separator Volume/Stock tank Volume

Stock Tank Fluid Properties

	Result	Units/Description
Shrinkage Recovery Factor	0.9787	Fraction of first stage separator liquid
Oil API Gravity at 60 °F	40.86	
Oil API Gravity, observed	40.86	at 59.96°F
Specific Gravity at 60 °F	0.8210	ASTM D7777, Measured
Reid Vapor Pressure, psi	4.05	Absolute Pressure at 100°F by D5191

Cylinder Pressure Check

	Pressure (psi)	Temperature (°F)
Sample Conditions	55.0	80.0
Test Sample	42.0	76.9

Quality Control Summary

Duplicate Results		Acceptable Range
Gas Oil Ratio (% difference)	1.4	<5%
Separator Volume Factor (% difference)	0.3	<5%
Shrinkage Recovery Factor (% difference)	0.3	<5%
Cylinder Type	Piston	
Cylinder Size (cc)	500	
Cylinder Number	735	
Sample Collection Rate (mL/min)	50	<50 mL/min

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Gas Evolved from Flashed Hydrocarbon Liquid

Analyst:	JMC	**Analysis Date**	8/23/2023
Client:	Denbury	**Date Sampled:**	8/23/2023
Facility:	MS Mallalieu EOR Facility	**Purpose:**	Flash Gas Analysis
Equipment:	Not Indicated	**Sample Source:**	Oil Treater Dump V105A
Unique #:	Not Indicated	**Pressure:**	Ambient
Sample Temperature:	70°F	**Type Sample:**	Spot
Sampled by:	JMC	**County:**	Not Indicated

COMPONENT	MOLE %	GPM
Nitrogen	3.143	
Carbon Dioxide	84.733	
Methane	0.903	
Ethane	1.172	0.316
Propane	2.972	0.824
Isobutane	1.134	0.374
n-Butane	2.788	0.885
Isopentane	1.063	0.391
n-Pentane	0.907	0.331
Hexanes	0.788	0.291
Heptanes Plus	0.397	0.166
Totals	100.000	3.578

Specific Gravity	1.554
Compressibility (Z)	0.9929
Molecular Weight	44.69

Saturated Ideal BTUs	360.8	Saturated Real BTUs	363.4
Dry Ideal BTUs	367.2	Dry Real BTUs	369.9

Base Conditions: 14.73 psi, 60 °F

Gas Evolved from Flashed Hydrocarbon Liquid
Extended Analysis Report

COMPONENT	MOLE %	BTU	GPM	WT %
Nitrogen	3.143			1.970
Carbon Dioxide	84.732			83.435
Methane	0.903	9.141		0.324
Ethane	1.172	20.789	0.316	0.788
Propane	2.972	74.951	0.824	2.932
Isobutane	1.134	36.962	0.374	1.475
n-Butane	2.788	91.163	0.885	3.626
Isopentane	1.063	42.628	0.391	1.716
n-Pentane	0.907	36.443	0.331	1.464
2,2-Dimethylbutane	0.023	1.092	0.010	0.044
Cyclopentane	0.030	1.114	0.009	0.046
2,3-Dimethylbutane	0.035	1.318	0.010	0.055
2-Methylpentane	0.236	8.885	0.070	0.370
3-Methylpentane	0.130	6.190	0.053	0.251
n-Hexane	0.335	15.969	0.139	0.646
Methylcyclopentane	0.064	3.546	0.030	0.144
Benzene	0.044	1.650	0.012	0.077
Cyclohexane	0.111	4.987	0.038	0.209
2-Methylhexane	0.003	0.143	0.001	0.006
3-Methylhexane	0.002	0.099	0.001	0.004
2,2,4-Trimethylpentane	0.000	0.000	0.000	0.000
Other Heptanes	0.004	0.224	0.002	0.009
n-Heptane	0.088	4.868	0.041	0.198
Methylcyclohexane	0.017	0.889	0.007	0.037
Toluene	0.004	0.179	0.001	0.008
Other Octanes	0.016	0.977	0.008	0.040
n-Octane	0.008	0.526	0.004	0.021
Ethylbenzene	0.001	0.052	0.000	0.002
m,p-Xylene	0.004	0.206	0.002	0.010
o-Xylene	0.001	0.052	0.000	0.002
Other Nonanes	0.012	0.866	0.007	0.036
n-Nonane	0.007	0.466	0.004	0.019
Other Decanes	0.008	0.598	0.005	0.025
n-Decane	0.002	0.171	0.002	0.007
Undecanes+	0.001	0.085	0.001	0.004
Totals	100.000	367.2	3.578	100.000

Specific Gravity	1.554		
Compressibility (Z)	0.993		
Molecular Weight	44.694		
Saturated Ideal BTUs	360.8	Saturated Real BTUs	363.4
Dry Ideal BTUs	367.2	Dry Real BTUs	369.9

Base Conditions: 14.73 psi, 60 °F

HAP Weight Fraction	**0.0075**
VOC Weight Fraction	**0.1339**
Higher Heating Value (BTU/ft^3)	**367.2**
Lower Heating Value (BTU/ft^3)	**338.8**

Tank Emission Calculations Based on AP 42 Chapter 7 (June 2020, Section 7.1.3.1), Fixed Roof

Tank ID	**7-05-OST-V**
Tank Description	**5000 BBL Dry Oil Tank-Vent (V-119B)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**38.60**
Vertical Height/Horizontal Length (H_S ft)	**24.10**
Roof Height (H_R ft)	**1.21**
Max Liquid Height (H_{LX} ft)	**23.10**
Avg Liquid Height (H_L ft)	**11.55**
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)	**0.58**
Roof Paint Solar Absorptance (R_A)	**0.58**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.4021**

Tank Shell Color/Shade	**Gray - Light**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Gray - Light**
Tank Roof Paint Condition	**average**
Roof Type	**vertical tank with cone roof**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**36,500.00**
Annual Turnovers, N	**7.58**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**27,031.89**
vapor space outage (H_{VO} ft)	**12.952**
vapor space volume (V_V ft^3)	**15,156.68**

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**	**40.9**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**40.9**
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)	48.11	51.86	59.38	67.57	76.11	82.62	85.03	84.52	78.74	67.70	56.70	49.26	67.30
average vapor temperature (T_V °F)	51.12	55.85	64.64	74.34	83.52	90.41	92.59	91.62	84.80	72.55	60.25	52.05	72.81
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)	22.81	27.10	31.42	36.12	36.73	37.35	36.14	35.31	32.98	30.88	26.44	22.75	31.33
daily average liquid surface temperature (T_{LA} °F)	49.62	53.85	62.01	70.95	79.81	86.52	88.81	88.07	81.77	70.12	58.48	50.66	70.05
daily maximum liquid surface temperature (T_{LX} °F)	55.32	60.63	69.87	79.98	89.00	95.85	97.85	96.90	90.02	77.84	65.09	56.35	77.88
daily minimum liquid surface temperature (T_{LN} °F)	43.91	47.08	54.16	61.92	70.63	77.18	79.78	79.24	73.53	62.40	51.87	44.97	62.22
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	3.156	3.425	3.994	4.701	5.496	6.165	6.408	6.329	5.685	4.632	3.739	3.221	4.626
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	3.522	3.893	4.611	5.512	6.428	7.201	7.438	7.324	6.538	5.311	4.227	3.592	5.315
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	2.821	3.003	3.445	3.988	4.674	5.249	5.493	5.442	4.922	4.023	3.297	2.881	4.009
daily vapor pressure range (ΔP_V)	0.7012	0.8894	1.1655	1.5247	1.7533	1.9510	1.9456	1.8823	1.6163	1.2876	0.9302	0.7107	1.3053
vapor space expansion factor (K_E)	0.1064	0.1328	0.1708	0.2231	0.2620	0.3014	0.3052	0.2938	0.2435	0.1883	0.1372	0.1074	0.1909
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	17,403	15,719	17,403	16,842	17,403	16,842	17,403	17,403	16,842	17,403	16,842	17,403	204,911
monthly turnovers (N/month) with avg = total annual	0.64	0.58	0.64	0.62	0.64	0.62	0.64	0.64	0.62	0.64	0.62	0.64	7.58
vented vapor saturation factor (K_S)	0.3158	0.2984	0.2672	0.2366	0.2095	0.1911	0.1852	0.1871	0.2040	0.2393	0.2804	0.3114	0.2395
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	0.0355	0.0410	0.0471	0.0522	0.0541	0.0535	0.0487	0.0405	0.0335	0.0293	0.0405
standing storage losses (L_S lb/month & avg is lb/yr)	618.35	600.54	762.33	852.56	1012.54	1085.29	1161.06	1148.75	1011.20	870.86	696.44	629.83	10449.75
working losses (L_W lb/month & avg is lb/yr)	375.80	364.98	463.31	518.15	615.37	659.59	705.64	698.15	614.56	529.27	423.26	382.78	6350.87
total losses (L_T lb/month & avg is lb/yr)	994.15	965.52	1225.65	1370.71	1627.91	1744.89	1866.70	1846.90	1625.75	1400.13	1119.70	1012.61	16800.61
max hourly Q in bbl/hour	23.39	23.39	23.39	23.39	23.39	23.39	23.39	23.39	23.39	23.39	23.39	23.39	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.505	0.543	0.623	0.720	0.827	0.916	0.948	0.938	0.854	0.711	0.588	0.514	
breathing/standing loss (L_S lb/hr)	0.831	0.894	1.025	1.367	1.634	1.900	1.930	1.857	1.526	1.171	0.967	0.847	
max hourly total loss (L_T lb/hr)	1.336	1.437	1.647	2.087	2.462	2.816	2.879	2.795	2.380	1.882	1.555	1.361	

L_S sum months	L_W sum months	L_T sum months
10449.75	6350.87	16800.61

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	**1.168**	**1.930**	**10,235.727**
Working Loss L_W	**0.710**	**0.948**	**6,220.795**
Total Loss L_T	**1.879**	**2.879**	**16,456.522**

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	**8a-05-GBT-CV & 8b-05-GBT-CV**
Tank Description	**1500 BBL Oil/ Water Skim Tank-Common Vent (V-120A/B)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**21.50**
Vertical Height/Horizontal Length (H_S ft)	**24.10**
Roof Height (H_R ft)	**0.67**
Max Liquid Height (H_{LX} ft)	**23.10**
Avg Liquid Height (H_L ft)	**11.55**
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)	**0.58**
Roof Paint Solar Absorptance (R_A)	**0.58**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.2240**

Tank Shell Color/Shade	**Gray - Light**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Gray - Light**
Tank Roof Paint Condition	**average**
Roof Type	**vertical tank with cone roof**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**1,370,118.75**
Annual Turnovers, N	**917.17**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**8,386.46**
vapor space outage (H_{VO} ft)	**12.774**
vapor space volume (V_V ft^3)	**4,637.59**

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**	**40.9**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**40.9**
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	5046.713	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)	48.11	51.86	59.38	67.57	76.11	82.62	85.03	84.52	78.74	67.70	56.70	49.26	67.30
average vapor temperature (T_V °F)	50.70	55.29	63.91	73.39	82.48	89.31	91.53	90.63	83.95	71.87	59.75	51.66	72.03
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)	23.33	27.38	31.42	36.12	36.73	37.35	36.14	35.31	32.98	30.88	27.01	23.36	31.33
daily average liquid surface temperature (T_{LA} °F)	49.41	53.57	61.64	70.48	79.29	85.97	88.28	87.57	81.35	69.78	58.23	50.46	69.66
daily maximum liquid surface temperature (T_{LX} °F)	55.24	60.42	69.50	79.51	88.48	95.31	97.31	96.40	89.59	77.50	64.98	56.30	77.50
daily minimum liquid surface temperature (T_{LN} °F)	43.57	46.73	53.79	61.45	70.11	76.63	79.24	78.75	73.10	62.06	51.48	44.62	61.83
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	0.177	0.206	0.275	0.373	0.501	0.621	0.667	0.653	0.535	0.365	0.244	0.184	0.363
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	0.219	0.264	0.361	0.504	0.672	0.830	0.882	0.858	0.696	0.472	0.309	0.228	0.472
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	0.142	0.160	0.208	0.273	0.369	0.459	0.500	0.492	0.408	0.279	0.191	0.148	0.277
daily vapor pressure range (ΔP_V)	0.0769	0.1035	0.1533	0.2307	0.3028	0.3712	0.3825	0.3664	0.2876	0.1927	0.1183	0.0797	0.1949
vapor space expansion factor (K_E)	0.0512	0.0606	0.0710	0.0844	0.0897	0.0951	0.0935	0.0909	0.0815	0.0719	0.0604	0.0513	0.0729
vapor molecular weight (M_V lb/lbmole)	18.58	18.54	18.48	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	653,280	590,059	653,280	632,207	653,280	632,207	653,280	653,280	632,207	653,280	632,207	653,280	7,691,847
monthly turnovers (N/month) with avg = total annual	77.90	70.36	77.90	75.38	77.90	75.38	77.90	77.90	75.38	77.90	75.38	77.90	917.17
vented vapor saturation factor (K_S)	0.8930	0.8775	0.8429	0.7982	0.7469	0.7042	0.6887	0.6935	0.7341	0.8020	0.8583	0.8892	0.8026
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	0.0019	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)	5.05	5.26	7.62	9.79	13.30	15.73	17.40	17.05	13.71	9.91	6.59	5.24	126.66
working losses (L_W lb/month & avg is lb/yr)	294.17	306.27	443.53	569.93	774.08	915.43	1012.89	992.39	798.15	576.97	383.90	305.15	7372.87
total losses (L_T lb/month & avg is lb/yr)	299.22	311.53	451.15	579.72	787.38	931.16	1030.29	1009.43	811.86	586.88	390.50	310.39	7499.53
max hourly Q in bbl/hour	878.06	878.06	878.06	878.06	878.06	878.06	878.06	878.06	878.06	878.06	878.06	878.06	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.395	0.456	0.596	0.792	1.040	1.271	1.361	1.334	1.109	0.776	0.533	0.410	
breathing/standing loss (L_S lb/hr)	0.007	0.008	0.010	0.016	0.020	0.025	0.026	0.025	0.019	0.013	0.009	0.007	
max hourly total loss (L_T lb/hr)	0.402	0.464	0.607	0.807	1.061	1.296	1.387	1.359	1.128	0.789	0.542	0.417	

L_S sum months	L_W sum months	L_T sum months
126.66	7372.87	7499.53

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	**0.013**	**0.026**	**116.209**
Working Loss L_W	**0.772**	**1.361**	**6,764.684**
Total Loss L_T	**0.785**	**1.387**	**6,880.893**

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	**9a-05-WST-CV & 9b-05-WST-CV**
Tank Description	**2000 BBL Produced Water Tank-Vent (V-129A/B)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**29.89**
Vertical Height/Horizontal Length (H_S ft)	**16.00**
Roof Height (H_R ft)	**0.93**
Max Liquid Height (H_{LX} ft)	**15.00**
Avg Liquid Height (H_L ft)	**7.50**
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)	**0.58**
Roof Paint Solar Absorptance (R_A)	**0.58**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.3114**

Tank Shell Color/Shade	**Gray - Light**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Gray - Light**
Tank Roof Paint Condition	**average**
Roof Type	**vertical tank with cone roof**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**0.00**
Annual Turnovers, N	**0.00**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**10,528.08**
vapor space outage (H_{VO} ft)	**8.811**
vapor space volume (V_V ft^3)	**6,184.47**

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	**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*
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)	48.11	51.86	59.38	67.57	76.11	82.62	85.03	84.52	78.74	67.70	56.70	49.26	67.30
average vapor temperature (T_V °F)	51.23	55.99	64.83	74.58	83.79	90.69	92.87	91.88	85.02	72.72	60.38	52.15	73.00
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)	22.73	27.10	31.42	36.12	36.73	37.35	36.14	35.31	32.98	30.88	26.38	22.60	31.33
daily average liquid surface temperature (T_{LA} °F)	49.67	53.93	62.11	71.07	79.95	86.65	88.95	88.20	81.88	70.21	58.54	50.71	70.15
daily maximum liquid surface temperature (T_{LX} °F)	55.35	60.70	69.96	80.10	89.13	95.99	97.98	97.03	90.12	77.93	65.13	56.36	77.98
daily minimum liquid surface temperature (T_{LN} °F)	43.99	47.15	54.25	62.04	70.76	77.32	79.91	79.37	73.63	62.49	51.95	45.06	62.32
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	0.176	0.206	0.276	0.377	0.506	0.629	0.676	0.660	0.539	0.366	0.243	0.183	0.365
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	0.217	0.263	0.363	0.509	0.680	0.841	0.894	0.868	0.701	0.474	0.307	0.225	0.475
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	0.142	0.160	0.208	0.275	0.373	0.464	0.506	0.497	0.411	0.280	0.191	0.148	0.278
daily vapor pressure range (ΔP_V)	0.0750	0.1028	0.1545	0.2335	0.3070	0.3767	0.3879	0.3712	0.2907	0.1940	0.1158	0.0771	0.1966
vapor space expansion factor (K_E)	0.0499	0.0599	0.0711	0.0845	0.0899	0.0955	0.0939	0.0912	0.0817	0.0720	0.0590	0.0497	0.0730
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	0	0	0	0	0	0	0	0	0	0	0	0	0
monthly turnovers (N/month) with avg = total annual	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
vented vapor saturation factor (K_S)	0.9242	0.9124	0.8858	0.8504	0.8088	0.7731	0.7601	0.7644	0.7988	0.8541	0.8980	0.9214	0.8544
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	0.0019	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)	6.91	7.23	10.57	13.70	18.71	22.19	24.56	24.03	19.23	13.79	9.08	7.16	177.16
working losses (L_W lb/month & avg is lb/yr)	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
total losses (L_T lb/month & avg is lb/yr)	6.91	7.23	10.57	13.70	18.71	22.19	24.56	24.03	19.23	13.79	9.08	7.16	177.16
max hourly Q in bbl/hour	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
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)	0.009	0.011	0.014	0.022	0.029	0.036	0.038	0.036	0.028	0.019	0.013	0.010	
max hourly total loss (L_T lb/hr)	0.009	0.011	0.014	0.022	0.029	0.036	0.038	0.036	0.028	0.019	0.013	0.010	

L_S sum months	L_W sum months	L_T sum months
177.16	0.00	177.16

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	**0.018**	**0.038**	**161.985**
Working Loss L_W	**0.000**	**0.000**	**0.000**
Total Loss L_T	**0.018**	**0.038**	**161.985**

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	**9c-09-WST-CV**
Tank Description	**4500 BBL Produced Water Tank-Common Vent (V-129C)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**29.70**
Vertical Height/Horizontal Length (H_S ft)	**24.10**
Roof Height (H_R ft)	**0.93**
Max Liquid Height (H_{LX} ft)	**23.10**
Avg Liquid Height (H_L ft)	**11.55**
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)	**0.58**
Roof Paint Solar Absorptance (R_A)	**0.58**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.3094**

Tank Shell Color/Shade	**Gray - Light**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Gray - Light**
Tank Roof Paint Condition	**average**
Roof Type	**vertical tank with cone roof**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**0.00**
Annual Turnovers, N	**0.00**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**16,003.49**
vapor space outage (H_{VO} ft)	**12.859**
vapor space volume (V_V ft^3)	**8,908.87**

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	**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*
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)	48.11	51.86	59.38	67.57	76.11	82.62	85.03	84.52	78.74	67.70	56.70	49.26	67.30
average vapor temperature (T_V °F)	50.93	55.60	64.31	73.91	83.06	89.92	92.12	91.18	84.42	72.24	60.03	51.88	72.46
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)	23.04	27.15	31.42	36.12	36.73	37.35	36.14	35.31	32.98	30.88	26.69	23.02	31.33
daily average liquid surface temperature (T_{LA} °F)	49.52	53.73	61.85	70.74	79.58	86.27	88.57	87.85	81.58	69.97	58.37	50.57	69.88
daily maximum liquid surface temperature (T_{LX} °F)	55.28	60.52	69.70	79.77	88.76	95.61	97.61	96.68	89.83	77.69	65.04	56.33	77.71
daily minimum liquid surface temperature (T_{LN} °F)	43.76	46.94	53.99	61.71	70.40	76.93	79.54	79.02	73.34	62.25	51.69	44.82	62.04
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	0.175	0.204	0.274	0.372	0.500	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)	0.216	0.261	0.359	0.503	0.672	0.831	0.884	0.859	0.695	0.470	0.306	0.224	0.470
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	0.140	0.159	0.206	0.272	0.368	0.459	0.500	0.491	0.407	0.277	0.189	0.146	0.275
daily vapor pressure range (ΔP_V)	0.0756	0.1024	0.1533	0.2312	0.3039	0.3728	0.3840	0.3676	0.2882	0.1926	0.1166	0.0782	0.1950
vapor space expansion factor (K_E)	0.0505	0.0600	0.0710	0.0844	0.0898	0.0952	0.0936	0.0910	0.0815	0.0719	0.0597	0.0506	0.0729
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	0	0	0	0	0	0	0	0	0	0	0	0	0
monthly turnovers (N/month) with avg = total annual	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
vented vapor saturation factor (K_S)	0.8936	0.8778	0.8428	0.7976	0.7457	0.7026	0.6872	0.6921	0.7332	0.8018	0.8586	0.8898	0.8023
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)	9.28	9.71	14.16	18.32	25.01	29.66	32.84	32.15	25.77	18.50	12.21	9.64	237.24
working losses (L_W lb/month & avg is lb/yr)	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
total losses (L_T lb/month & avg is lb/yr)	9.28	9.71	14.16	18.32	25.01	29.66	32.84	32.15	25.77	18.50	12.21	9.64	237.24
max hourly Q in bbl/hour	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
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)	0.012	0.014	0.019	0.029	0.038	0.047	0.049	0.046	0.037	0.025	0.017	0.013	
max hourly total loss (L_T lb/hr)	0.012	0.014	0.019	0.029	0.038	0.047	0.049	0.046	0.037	0.025	0.017	0.013	

L_S sum months	L_W sum months	L_T sum months
237.24	0.00	237.24

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	**0.025**	**0.049**	**217.064**
Working Loss L_W	**0.000**	**0.000**	**0.000**
Total Loss L_T	**0.025**	**0.049**	**217.064**

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	**10-05-SOT-V**
Tank Description	**300 BBL Slop Oil Tank-Vent (V-132)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**12.00**
Vertical Height/Horizontal Length (H_S ft)	**15.00**
Roof Height (H_R ft)	**0.38**
Max Liquid Height (H_{LX} ft)	**14.00**
Avg Liquid Height (H_L ft)	**7.00**
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)	**0.58**
Roof Paint Solar Absorptance (R_A)	**0.58**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.1250**

Tank Shell Color/Shade	**Gray - Light**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Gray - Light**
Tank Roof Paint Condition	**average**
Roof Type	**vertical tank with cone roof**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**2,737.50**
Annual Turnovers, N	**9.71**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**1,583.36**
vapor space outage (H_{VO} ft)	**8.125**
vapor space volume (V_V ft^3)	**918.92**

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**	**40.9**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**40.9**
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)	48.11	51.86	59.38	67.57	76.11	82.62	85.03	84.52	78.74	67.70	56.70	49.26	67.30
average vapor temperature (T_V °F)	50.62	55.19	63.77	73.21	82.29	89.11	91.34	90.44	83.79	71.74	59.66	51.59	71.89
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)	23.42	27.46	31.42	36.12	36.73	37.35	36.14	35.31	32.98	30.94	27.11	23.47	31.33
daily average liquid surface temperature (T_{LA} °F)	49.37	53.52	61.58	70.39	79.20	85.87	88.18	87.48	81.27	69.72	58.18	50.43	69.59
daily maximum liquid surface temperature (T_{LX} °F)	55.22	60.39	69.43	79.42	88.38	95.21	97.22	96.31	89.51	77.45	64.96	56.29	77.43
daily minimum liquid surface temperature (T_{LN} °F)	43.51	46.66	53.72	61.36	70.02	76.53	79.15	78.65	73.02	61.98	51.40	44.56	61.76
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	3.141	3.404	3.962	4.654	5.438	6.098	6.340	6.266	5.636	4.598	3.718	3.206	4.588
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	3.516	3.875	4.574	5.459	6.362	7.125	7.363	7.254	6.484	5.275	4.217	3.588	5.272
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	2.799	2.979	3.417	3.946	4.623	5.190	5.433	5.387	4.878	3.992	3.268	2.858	3.976
daily vapor pressure range (ΔP_V)	0.7171	0.8965	1.1580	1.5126	1.7386	1.9344	1.9296	1.8677	1.6053	1.2826	0.9498	0.7305	1.2969
vapor space expansion factor (K_E)	0.1089	0.1340	0.1698	0.2212	0.2592	0.2977	0.3014	0.2903	0.2413	0.1875	0.1402	0.1105	0.1896
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	1,305	1,179	1,305	1,263	1,305	1,263	1,305	1,305	1,263	1,305	1,263	1,305	15,368
monthly turnovers (N/month) with avg = total annual	0.82	0.74	0.82	0.80	0.82	0.80	0.82	0.82	0.80	0.82	0.80	0.82	9.71
vented vapor saturation factor (K_S)	0.4251	0.4056	0.3695	0.3329	0.2993	0.2758	0.2681	0.2704	0.2918	0.3356	0.3844	0.4200	0.3361
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)	0.0287	0.0308	0.0353	0.0407	0.0468	0.0518	0.0536	0.0531	0.0483	0.0403	0.0334	0.0292	0.0402
standing storage losses (L_S lb/month & avg is lb/yr)	52.04	50.48	64.00	71.46	84.83	90.91	97.29	96.31	84.86	73.16	58.59	53.03	876.97
working losses (L_W lb/month & avg is lb/yr)	28.08	27.24	34.53	38.55	45.77	49.05	52.49	51.95	45.78	39.47	31.61	28.61	473.10
total losses (L_T lb/month & avg is lb/yr)	80.12	77.72	98.52	110.01	130.60	139.96	149.78	148.26	130.64	112.63	90.19	81.63	1350.07
max hourly Q in bbl/hour	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.038	0.041	0.046	0.054	0.062	0.068	0.071	0.070	0.064	0.053	0.044	0.038	
breathing/standing loss (L_S lb/hr)	0.070	0.075	0.086	0.115	0.139	0.163	0.166	0.160	0.130	0.098	0.081	0.071	
max hourly total loss (L_T lb/hr)	0.108	0.116	0.132	0.168	0.200	0.231	0.236	0.229	0.194	0.151	0.125	0.110	

L_S sum months	L_W sum months	L_T sum months
876.97	473.10	1350.07

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	**0.098**	**0.166**	**859.227**
Working Loss L_W	**0.053**	**0.071**	**463.528**
Total Loss L_T	**0.151**	**0.236**	**1,322.755**

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	**11-05-IOT-V & 12-05-IOT-V**
Tank Description	**1000 BBL Inhibitor Oil Tank-Vent (V-133A/B)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**21.50**
Vertical Height/Horizontal Length (H_S ft)	**16.10**
Roof Height (H_R ft)	**0.67**
Max Liquid Height (H_{LX} ft)	**15.10**
Avg Liquid Height (H_L ft)	**7.55**
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)	**11,430.00**
Annual Turnovers, N	**11.71**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**5,482.06**
vapor space outage (H_{VO} ft)	**8.774**
vapor space volume (V_V ft^3)	**3,185.39**

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**	**40.9**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**40.9**
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)	51.43	56.26	65.18	75.03	84.28	91.21	93.37	92.35	85.42	73.04	60.61	52.34	73.37
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)	23.79	28.35	33.06	38.23	39.04	39.78	38.50	37.53	34.87	32.39	27.57	23.70	33.06
daily average liquid surface temperature (T_{LA} °F)	49.84	54.15	62.41	71.46	80.37	87.10	89.38	88.60	82.22	70.48	58.74	50.87	70.46
daily maximum liquid surface temperature (T_{LX} °F)	55.79	61.24	70.67	81.02	90.13	97.04	99.00	97.98	90.94	78.58	65.63	56.79	78.73
daily minimum liquid surface temperature (T_{LN} °F)	43.90	47.07	54.14	61.90	70.61	77.15	79.75	79.22	73.51	62.39	51.85	44.94	62.20
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	3.170	3.445	4.023	4.744	5.549	6.226	6.469	6.385	5.730	4.662	3.758	3.234	4.660
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	3.554	3.937	4.678	5.612	6.551	7.342	7.579	7.455	6.640	5.380	4.270	3.622	5.393
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	2.820	3.003	3.444	3.986	4.672	5.247	5.490	5.440	4.920	4.022	3.296	2.879	4.008
daily vapor pressure range (ΔP_V)	0.7337	0.9347	1.2337	1.6259	1.8783	2.0945	2.0886	2.0150	1.7197	1.3579	0.9740	0.7426	1.3853
vapor space expansion factor (K_E)	0.1112	0.1394	0.1807	0.2380	0.2813	0.3248	0.3290	0.3156	0.2596	0.1986	0.1436	0.1121	0.2026
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	5,450	4,922	5,450	5,274	5,450	5,274	5,450	5,450	5,274	5,450	5,274	5,450	64,168
monthly turnovers (N/month) with avg = total annual	0.99	0.90	0.99	0.96	0.99	0.96	0.99	0.99	0.96	0.99	0.96	0.99	11.71
vented vapor saturation factor (K_S)	0.4042	0.3843	0.3483	0.3119	0.2793	0.2567	0.2495	0.2519	0.2729	0.3157	0.3640	0.3994	0.3157
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	0.0311	0.0357	0.0413	0.0475	0.0527	0.0545	0.0539	0.0490	0.0408	0.0337	0.0294	0.0407
standing storage losses (L_S lb/month & avg is lb/yr)	182.57	177.51	225.64	252.73	300.28	321.92	344.29	340.47	299.42	257.59	205.73	185.91	3094.06
working losses (L_W lb/month & avg is lb/yr)	118.13	114.86	146.00	163.52	194.29	208.29	222.76	220.29	193.73	166.67	133.11	120.29	2001.93
total losses (L_T lb/month & avg is lb/yr)	300.70	292.37	371.64	416.25	494.57	530.20	567.05	560.77	493.15	424.26	338.84	306.19	5095.99
max hourly Q in bbl/hour	7.33	7.33	7.33	7.33	7.33	7.33	7.33	7.33	7.33	7.33	7.33	7.33	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.159	0.171	0.196	0.227	0.261	0.289	0.299	0.296	0.269	0.224	0.185	0.162	
breathing/standing loss (L_S lb/hr)	0.245	0.264	0.303	0.407	0.496	0.583	0.594	0.569	0.461	0.346	0.286	0.250	
max hourly total loss (L_T lb/hr)	0.404	0.435	0.500	0.634	0.757	0.872	0.893	0.865	0.730	0.570	0.471	0.412	

L_S sum months	L_W sum months	L_T sum months
3094.06	2001.93	5095.99

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	**0.346**	**0.594**	**3,029.915**
Working Loss L_W	**0.224**	**0.299**	**1,960.426**
Total Loss L_T	**0.570**	**0.893**	**4,990.341**

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

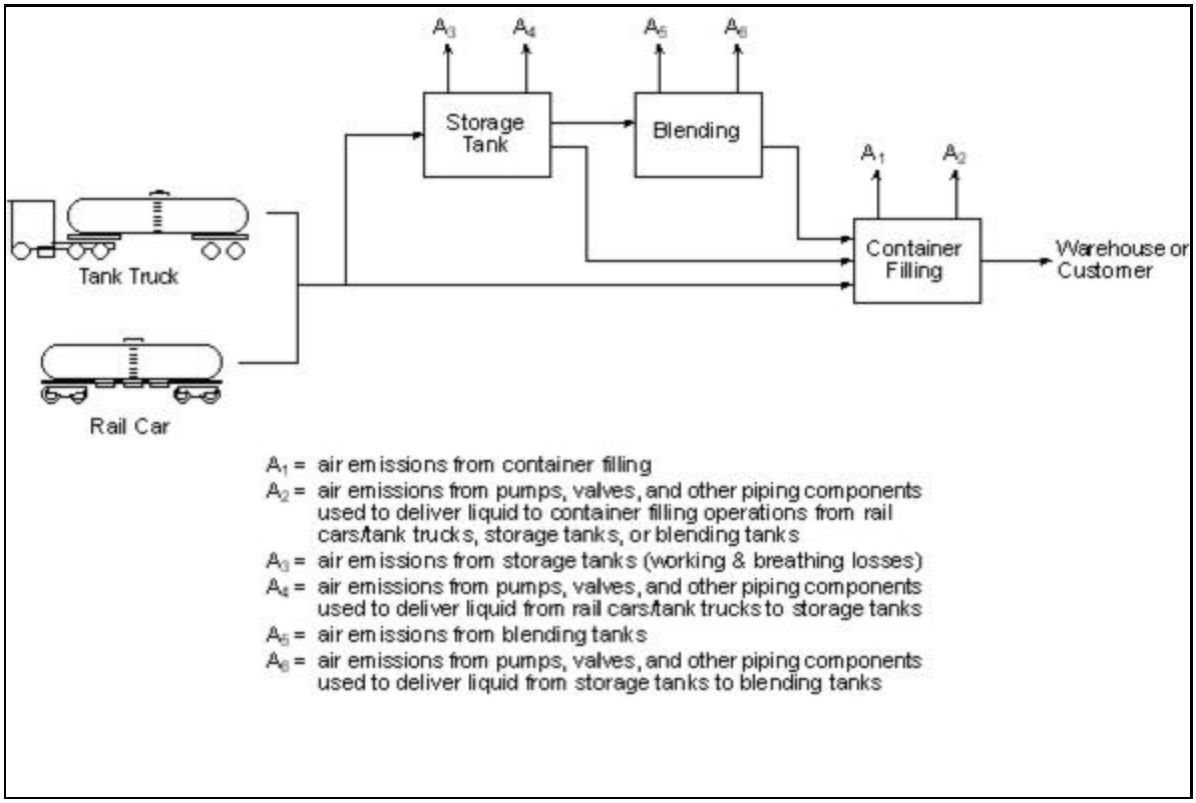
EPCRA Section 313

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

Tank Emission Calculations Based on AP 42 Chapter 7 (June 2020, Section 7.1.3.1), Fixed Roof

Tank ID	**13-05-ST**
Tank Description	**152 BBL Corrosion Chemical Storage Tank (V-134)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Horizontal**
Tank Diameter (D ft)	**8.30**
Vertical Height/Horizontal Length (H_S ft)	**16.00**
Roof Height (H_R ft)	
Max Liquid Height (H_{LX} ft)	**8.30**
Avg Liquid Height (H_L ft)	**4.15**
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)	**10,000.00**
Annual Turnovers, N	**64.85**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**865.70**
vapor space outage (H_{VO} ft)	**3.259**
vapor space volume (V_V ft^3)	**432.85**

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	**0.629**

*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)	52.31	57.43	66.72	77.01	86.45	93.48	95.58	94.43	87.19	74.46	61.65	53.16	74.98
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	27.37	40.51
daily average liquid surface temperature (T_{LA} °F)	50.59	55.14	63.71	73.14	82.20	89.02	91.25	90.36	83.72	71.69	59.62	51.56	71.83
daily maximum liquid surface temperature (T_{LX} °F)	57.52	63.58	73.76	84.98	94.47	101.60	103.44	102.15	94.49	81.42	67.69	58.40	81.96
daily minimum liquid surface temperature (T_{LN} °F)	43.65	46.70	53.66	61.29	69.94	76.45	79.06	78.58	72.96	61.95	51.55	44.72	61.70
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	1.488	1.682	2.104	2.664	3.313	3.881	4.083	4.001	3.433	2.571	1.893	1.528	2.580
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	1.792	2.097	2.705	3.536	4.389	5.135	5.342	5.195	4.391	3.253	2.327	1.834	3.294
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	1.228	1.338	1.617	1.977	2.462	2.888	3.075	3.040	2.653	2.011	1.528	1.266	1.998
daily vapor pressure range (ΔP_V)	0.5634	0.7593	1.0879	1.5591	1.9274	2.2465	2.2663	2.1557	1.7385	1.2419	0.7997	0.5680	1.2957
vapor space expansion factor (K_E)	0.0976	0.1246	0.1643	0.2203	0.2623	0.3025	0.3053	0.2903	0.2358	0.1771	0.1254	0.0972	0.1846
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	4,768	4,307	4,768	4,614	4,768	4,614	4,768	4,768	4,614	4,768	4,614	4,768	56,140
monthly turnovers (N/month) with avg = total annual	5.51	4.97	5.51	5.33	5.51	5.33	5.51	5.51	5.33	5.51	5.33	5.51	64.85
vented vapor saturation factor (K_S)	0.7955	0.7748	0.7334	0.6848	0.6360	0.5986	0.5864	0.5913	0.6277	0.6925	0.7536	0.7912	0.6917
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)	0.0233	0.0261	0.0321	0.0399	0.0487	0.0563	0.0591	0.0580	0.0504	0.0387	0.0292	0.0239	0.0388
standing storage losses (L_S lb/month & avg is lb/yr)	40.00	40.43	55.00	66.10	83.47	93.43	101.17	99.36	83.60	66.23	48.35	41.00	818.12
working losses (L_W lb/month & avg is lb/yr)	70.04	70.81	96.31	115.77	146.18	163.62	177.18	174.00	146.41	115.98	84.68	71.80	1432.78
total losses (L_T lb/month & avg is lb/yr)	110.04	111.24	151.31	181.87	229.65	257.04	278.34	273.36	230.00	182.21	133.03	112.79	2250.90
max hourly Q in bbl/hour	6.41	6.41	6.41	6.41	6.41	6.41	6.41	6.41	6.41	6.41	6.41	6.41	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.150	0.167	0.206	0.256	0.312	0.361	0.378	0.372	0.323	0.248	0.187	0.153	
breathing/standing loss (L_S lb/hr)	0.054	0.060	0.074	0.108	0.147	0.184	0.191	0.180	0.135	0.089	0.067	0.055	
max hourly total loss (L_T lb/hr)	0.203	0.228	0.280	0.364	0.459	0.545	0.569	0.551	0.458	0.337	0.254	0.208	

L_S sum months	L_W sum months	L_T sum months
818.12	1432.78	2250.90

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	**0.089**	**0.191**	**781.771**
Working Loss L_W	**0.156**	**0.378**	**1,369.118**
Total Loss L_T	**0.246**	**0.569**	**2,150.889**

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	**14-05-SEP-V**
Tank Description	**API Oil/Water Separator**
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**	**40.9**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**40.9**
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	3.428	3.998	4.707	5.503	6.172	6.415	6.336	5.691	4.636	3.741	3.222	4.630
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	3.569	3.946	4.689	5.629	6.572	7.366	7.603	7.477	6.657	5.392	4.289	3.641	5.407
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	2.786	2.965	3.390	3.908	4.576	5.136	5.378	5.336	4.838	3.966	3.251	2.843	3.945
daily vapor pressure range (ΔP_V)	0.7838	0.9812	1.2989	1.7205	1.9957	2.2294	2.2243	2.1414	1.8192	1.4258	1.0388	0.7982	1.4623
vapor space expansion factor (K_E)	0.1189	0.1465	0.1903	0.2517	0.2983	0.3445	0.3491	0.3343	0.2741	0.2085	0.1532	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)	0.5160	0.4955	0.4572	0.4170	0.3796	0.3530	0.3442	0.3470	0.3717	0.4207	0.4737	0.5110	0.4210
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	0.0523	0.0542	0.0536	0.0487	0.0406	0.0335	0.0294	0.0406
standing storage losses (L_S lb/month & avg is lb/yr)	257.24	249.91	317.36	355.08	421.77	452.11	483.63	478.44	421.03	362.48	289.77	261.99	4350.79
working losses (L_W lb/month & avg is lb/yr)	75.24	73.10	92.82	103.86	123.36	132.24	141.46	139.94	123.15	106.02	84.75	76.63	1272.56
total losses (L_T lb/month & avg is lb/yr)	332.48	323.00	410.19	458.94	545.13	584.35	625.09	618.37	544.17	468.50	374.52	338.62	5623.36
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	0.143	0.118	0.103	
breathing/standing loss (L_S lb/hr)	0.346	0.372	0.427	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
4350.79	1272.56	5623.36

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**	**4,261.320**
Working Loss L_W	**0.142**	**0.190**	**1,246.393**
Total Loss L_T	**0.629**	**1.058**	**5,507.713**

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	**15-05-WST-CV**
Tank Description	**3000 BBL Salt Water Storage Tank (V-152)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**29.70**
Vertical Height/Horizontal Length (H_S ft)	**24.10**
Roof Height (H_R ft)	**0.93**
Max Liquid Height (H_{LX} ft)	**23.10**
Avg Liquid Height (H_L ft)	**11.55**
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)	**0.3094**

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)	**0.00**
Annual Turnovers, N	**0.00**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**16,003.49**
vapor space outage (H_{VO} ft)	**12.859**
vapor space volume (V_V ft^3)	**8,908.87**

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	**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*
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)	51.37	56.18	65.07	74.89	84.12	91.04	93.21	92.20	85.29	72.94	60.54	52.28	73.25
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)	23.85	28.35	33.06	38.23	39.04	39.78	38.50	37.53	34.87	32.39	27.64	23.77	33.06
daily average liquid surface temperature (T_{LA} °F)	49.81	54.11	62.35	71.39	80.29	87.01	89.29	88.53	82.16	70.43	58.70	50.84	70.40
daily maximum liquid surface temperature (T_{LX} °F)	55.77	61.20	70.62	80.94	90.05	96.96	98.92	97.91	90.88	78.53	65.61	56.78	78.67
daily minimum liquid surface temperature (T_{LN} °F)	43.85	47.02	54.08	61.83	70.53	77.07	79.67	79.14	73.44	62.33	51.79	44.89	62.14
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	0.177	0.207	0.278	0.381	0.512	0.636	0.683	0.667	0.544	0.369	0.245	0.184	0.368
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	0.220	0.267	0.371	0.523	0.700	0.866	0.919	0.892	0.718	0.483	0.312	0.228	0.486
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	0.141	0.159	0.207	0.273	0.370	0.461	0.502	0.493	0.408	0.278	0.190	0.147	0.276
daily vapor pressure range (ΔP_V)	0.0791	0.1083	0.1640	0.2497	0.3300	0.4057	0.4177	0.3985	0.3100	0.2050	0.1221	0.0815	0.2091
vapor space expansion factor (K_E)	0.0523	0.0627	0.0748	0.0896	0.0958	0.1020	0.1003	0.0972	0.0865	0.0756	0.0619	0.0522	0.0771
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	0	0	0	0	0	0	0	0	0	0	0	0	0
monthly turnovers (N/month) with avg = total annual	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
vented vapor saturation factor (K_S)	0.8926	0.8763	0.8405	0.7940	0.7413	0.6977	0.6823	0.6875	0.7295	0.7992	0.8571	0.8888	0.7994
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	0.0019	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)	9.88	10.36	15.17	19.70	26.91	31.94	35.33	34.54	27.62	19.78	13.00	10.25	254.48
working losses (L_W lb/month & avg is lb/yr)	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
total losses (L_T lb/month & avg is lb/yr)	9.88	10.36	15.17	19.70	26.91	31.94	35.33	34.54	27.62	19.78	13.00	10.25	254.48
max hourly Q in bbl/hour	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
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)	0.013	0.015	0.021	0.032	0.042	0.051	0.053	0.050	0.039	0.027	0.018	0.014	
max hourly total loss (L_T lb/hr)	0.013	0.015	0.021	0.032	0.042	0.051	0.053	0.050	0.039	0.027	0.018	0.014	

L_S sum months	L_W sum months	L_T sum months
254.48	0.00	254.48

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	**0.027**	**0.053**	**232.509**
Working Loss L_W	**0.000**	**0.000**	**0.000**
Total Loss L_T	**0.027**	**0.053**	**232.509**

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	**16-05-ST-V & 17-05-ST-V**
Tank Description	**API Separator Tank (V-154A/B)**
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)	**0.71**
Roof Paint Solar Absorptance (R_A)	**0.71**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.1250**

Tank Shell Color/Shade	**Gray - Medium**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Gray - Medium**
Tank Roof Paint Condition	**average**
Roof Type	**vertical tank with cone roof**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**109.50**
Annual Turnovers, N	**0.29**
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**	**40.9**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**40.9**
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)	51.25	56.02	64.87	74.63	83.84	90.74	92.92	91.93	85.06	72.75	60.40	52.17	73.04
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)	25.22	29.80	34.98	40.70	41.74	42.62	41.26	40.12	37.08	34.16	29.22	25.20	35.06
daily average liquid surface temperature (T_{LA} °F)	49.83	54.14	62.39	71.44	80.35	87.08	89.36	88.58	82.21	70.47	58.73	50.86	70.45
daily maximum liquid surface temperature (T_{LX} °F)	56.14	61.59	71.14	81.62	90.78	97.73	99.67	98.61	91.48	79.01	66.04	57.16	79.21
daily minimum liquid surface temperature (T_{LN} °F)	43.53	46.69	53.65	61.27	69.91	76.42	79.04	78.55	72.94	61.93	51.43	44.56	61.68
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	3.170	3.444	4.022	4.743	5.547	6.223	6.467	6.383	5.728	4.661	3.757	3.233	4.659
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	3.578	3.963	4.717	5.670	6.623	7.424	7.661	7.531	6.700	5.420	4.301	3.647	5.439
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	2.800	2.981	3.412	3.939	4.614	5.180	5.423	5.377	4.871	3.988	3.269	2.858	3.970
daily vapor pressure range (ΔP_V)	0.7779	0.9826	1.3052	1.7309	2.0083	2.2438	2.2382	2.1540	1.8285	1.4319	1.0321	0.7897	1.4694
vapor space expansion factor (K_E)	0.1179	0.1466	0.1911	0.2534	0.3007	0.3478	0.3525	0.3373	0.2760	0.2094	0.1521	0.1192	0.2149
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	52	47	52	51	52	51	52	52	51	52	51	52	615
monthly turnovers (N/month) with avg = total annual	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.29
vented vapor saturation factor (K_S)	0.3591	0.3402	0.3063	0.2724	0.2425	0.2220	0.2154	0.2176	0.2366	0.2759	0.3210	0.3545	0.2760
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	0.0311	0.0357	0.0414	0.0476	0.0527	0.0545	0.0539	0.0490	0.0408	0.0337	0.0294	0.0408
standing storage losses (L_S lb/month & avg is lb/yr)	63.86	62.10	78.94	88.42	105.06	112.64	120.46	119.12	104.75	90.11	71.96	65.03	1082.45
working losses (L_W lb/month & avg is lb/yr)	1.13	1.10	1.40	1.57	1.86	2.00	2.14	2.11	1.86	1.60	1.28	1.15	19.19
total losses (L_T lb/month & avg is lb/yr)	64.99	63.20	80.34	89.99	106.93	114.63	122.60	121.23	106.61	91.71	73.24	66.18	1101.63
max hourly Q in bbl/hour	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	
breathing/standing loss (L_S lb/hr)	0.086	0.092	0.106	0.143	0.174	0.204	0.207	0.198	0.160	0.121	0.100	0.087	
max hourly total loss (L_T lb/hr)	0.087	0.094	0.108	0.145	0.176	0.206	0.210	0.201	0.163	0.123	0.102	0.089	

L_S sum months	L_W sum months	L_T sum months
1082.45	19.19	1101.63

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	**0.121**	**0.207**	**1,059.984**
Working Loss L_W	**0.002**	**0.003**	**18.788**
Total Loss L_T	**0.123**	**0.210**	**1,078.772**

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 Air Quality Planning and Standards Research Triangle Park NC 27711
EPA-453/R-95-017 November 1995
Air

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Protocol for Equipment Leak Emission Estimates

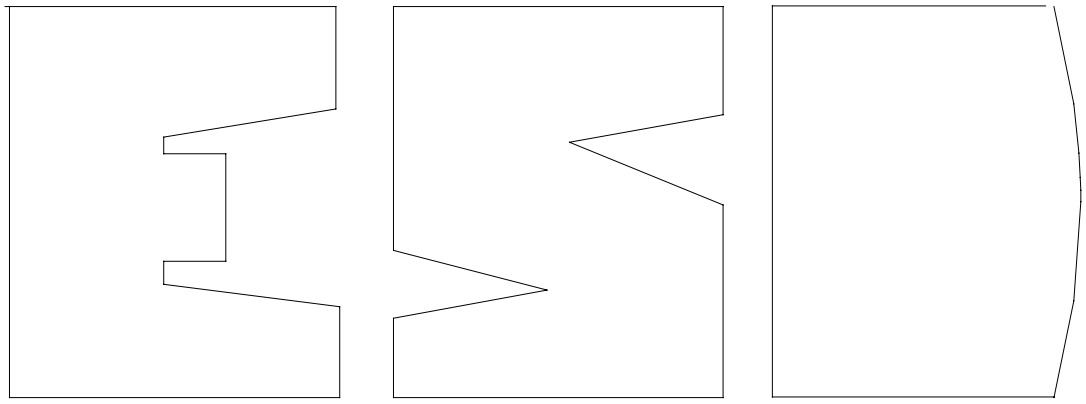

TABLE 2-4. OIL AND GAS PRODUCTION OPERATIONS AVERAGE EMISSION FACTORS (kg/hr/source)

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.

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Emission Factors for Oil and Gas Production Operations

American
Petroleum
Institute

possible in all cases to determine whether the corrected screening values were zero or some number between 1 and 9 ppmv. To be conservative, they were assumed to have screening values of 10 ppmv above background. Emissions from connections and open end lines in this group were calculated using the appropriate EPA default zeros; emission rates for flanges, pumps, valves, and other components in this category were calculated at a screening value of 10 ppmv. Table 4 shows the emission rates used to calculate the emissions of these components.

Table 4. Emission Rates Used for "Non-Emitters" (lb/component-day)

	EPA Default Zero	Equivalent Equation ppmv	Non-Emitter ppmv used	Non-Emitter Emission Rate used
Connection	0.000441	10.25	10.25	0.000441
Flange	0.000528	3.18	10.00	0.001183
Open End	0.000671	12.40	12.40	0.000671
Pump	0.001621	0.48	10.00	0.010348
Valve	0.000644	9.50	10.00	0.000671
Others	0.000209	0.13	10.00	0.002703

"Others" category includes instruments, loading arms, pressure relief valves, stuffing boxes, compressor seals, dump lever arms, and vents.

Adjustment for Flange and Other Connector Designations. The API 1993 database separates components as connection, valve, open-ended line, pump seal, compressor seal, pressure relief valve, instrument, hatch, polished rod stuffing box, dump lever arm, vent, meter, and drain. The database does not differentiate between non-emitting connections and non-emitting flanges; both types of components are included in a single category. Calculations in this report are based on a division of the connections into two categories: flange and other connections. Table 5 shows the assumptions used for assigning components to each category. These assumptions were based on component counts at sites 21 through 24 and additional inventory work at two light crude production sites. The sensitivity of the emission factors to these assumptions is discussed later in this report.

Table 5. Assumptions for Dividing API Connections by Type

Type of Site	Connection	Flange
Onshore Light Crude Production	71%	29%
Onshore Heavy Crude Production	71%	29%
Onshore Gas Production	86%	14%
Onshore Gas Plants	70%	30%
Offshore Oil and Gas Production	79%	21%

Fugitive Hydrocarbon Emissions from Oil and Gas Production Operations

HEALTH AND ENVIRONMENTAL SCIENCES
API PUBLICATION NUMBER 4589
DECEMBER 1993

STEP
Strategies for Today's Environmental Partnership

American Petroleum Institute
1220 L Street, Northwest
Washington, D.C. 20005

Using Table 3:

221 lb/day THC emissions x		
0.920 Methane	=	203 lb/day
0.080 NMHC	=	18 lb/day
0.035 VOC	=	8 lb/day
0.00338 C6+	=	0.7 lb/day
0.00023 Benzene	=	0.05 lb/day
0.00039 Toluene	=	0.09 lb/day
0.00002 Ethyl-Benzene	=	0.004 lb/day
0.00010 Xylenes	=	0.02 lb/day

Options to Method One

The total number of components at a site can be obtained by counting the number of valves and using Table 4 to estimate the other components. Table 4 was developed from 470,000 components inventoried at a total of 48 sites in three separate studies by API (1980), API/GRI (1993) and the US Minerals Management Service (1989).

Table 4. PERCENTAGE OF TOTAL COMPONENTS BY TYPE

	Connection	Valves	Open-Ends	Others
Light Crude	78.5%	18.5%	2%	1%
Heavy Crude	80%	15%	3.5%	1.5%
Gas Production	81%	15%	2.5%	1.5%
Gas Plant	76.5%	19%	2.5%	2%
Pacific Offshore	81.5%	14%	2.5%	2%
Gulf Offshore	80.5%	15%	2.5%	2%

NOTE: "Gulf" is Gulf of Mexico

Example Calculations

The hypothetical onshore gas production site in the example above had 1425 valves; the estimated total number of components is then:

1425 valves/0.15 = 9,500 total components.

Interpretation of Results

Method One is built on the assumption that the average leak rate of a group of components at one site is the same as the average leak rate of a second group of similar components at another site. A number of factors such as facility age, equipment condition, inspection and maintenance programs, and petroleum product characteristics could cause this assumption to be incorrect.

Williston Laboratory
3111 1st Ave W
Williston, ND 58801

Certificate of Analysis

Number: 172-23080185-002A

Aug. 29, 2023

Kevin Hendricks
Denbury
202 S 4th Street West
Baker, MT 59313

Station Name: MS Mallalieu EOR Facility
Sample Point: HP Separator
Method: GPA 2286
Cylinder No: 006793
Analyzed: 08/18/2023 13:25:06

Sampled By: John Fielder
Sample Of: Gas Spot
Sample Date: 08/03/2023 08:20
Sample Conditions: 780 psig, @ 80 °F
PO/Ref. No: 4300204782

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.696 psia
Nitrogen	0.4468	0.2898	
Methane	3.3743	1.2535	
Carbon Dioxide	94.3151	96.1167	
Ethane	0.5246	0.3653	0.1407
Propane	0.4475	0.4569	0.1237
Iso-Butane	0.1106	0.1489	0.0363
n-Butane	0.2786	0.3750	0.0881
Iso-Pentane	0.1244	0.2078	0.0456
n-Pentane	0.1054	0.1761	0.0383
Hexanes	0.0670	0.1337	0.0276
n-Hexane	0.0369	0.0736	0.0152
Benzene	0.0091	0.0165	0.0026
Cyclohexane	0.0216	0.0421	0.0074
Heptanes	0.0588	0.1364	0.0272
Methylcyclohexane	0.0235	0.0534	0.0095
Toluene	0.0033	0.0070	0.0011
Octanes	0.0263	0.0696	0.0135
Ethylbenzene	0.0004	0.0010	0.0002
Xylenes	0.0031	0.0076	0.0012
Nonanes	0.0175	0.0520	0.0099
Decanes Plus	0.0052	0.0171	0.0032
	100.0000	100.0000	0.5913

GPM TOTAL C2+ 0.591

Calculated Physical Properties	Total	C10+
Calculated Molecular Weight	43.18	142.28
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.696 psia & 60°F		
Higher Heating Value, Real Gas Dry BTU	91.34	7742.9
Water Sat. Gas Base BTU	89.79	7607.8
Relative Density Real Gas	1.4990	4.9126
Compressibility Factor	0.9943	

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.

Certificate of Analysis

Number: 172-23080185-001A

Williston Laboratory
3111 1st Ave W
Williston, ND 58801

Aug. 29, 2023

Kevin Hendricks
Denbury
202 S 4th Street West
Baker, MT 59313

Station Name: MS Mallalieu EOR Facility
Sample Point: Flare-EOR-180
Method: GPA 2286
Analyzed: 08/17/2023 16:19:42

Sampled By: John Fielder
Sample Of: Gas Spot
Sample Date: 08/03/2023 07:00
Sample Conditions: 0 psig, @ 80 °F
PO/Ref. No: 4300204782

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.696 psia
Nitrogen	22.5277	15.0552	
Methane	4.1256	1.5789	
Carbon Dioxide	56.0732	58.8718	
Ethane	1.3373	0.9593	0.3590
Propane	3.9612	4.1670	1.0955
Iso-Butane	1.7115	2.3731	0.5622
n-Butane	4.4646	6.1906	1.4129
Iso-Pentane	2.2146	3.8118	0.8130
n-Pentane	1.6363	2.8164	0.5954
Hexanes	0.8929	1.8356	0.3681
n-Hexane	0.3417	0.7025	0.1411
Benzene	0.0814	0.1517	0.0229
Cyclohexane	0.1506	0.3024	0.0514
Heptanes	0.3360	0.8032	0.1556
Methylcyclohexane	0.0664	0.1555	0.0268
Toluene	0.0031	0.0068	0.0010
Octanes	0.0467	0.1273	0.0240
Ethylbenzene	0.0006	0.0015	0.0002
Xylenes	0.0013	0.0033	0.0005
Nonanes	0.0196	0.0600	0.0111
Decanes Plus	0.0077	0.0261	0.0047
	100.0000	100.0000	5.6454

GPM TOTAL C2+ 5.645

Calculated Physical Properties	Total	C10+
Calculated Molecular Weight	41.92	142.28
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.696 psia & 60°F		
Higher Heating Value, Real Gas Dry BTU	620.0	7742.9
Water Sat. Gas Base BTU	609.5	7607.8
Relative Density Real Gas	1.4560	4.9126
Compressibility Factor	0.9936	

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.

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_x	100 percent S in fuel to SO_x		

Technical Guidance Package for
Chemical Sources

Flare Sources

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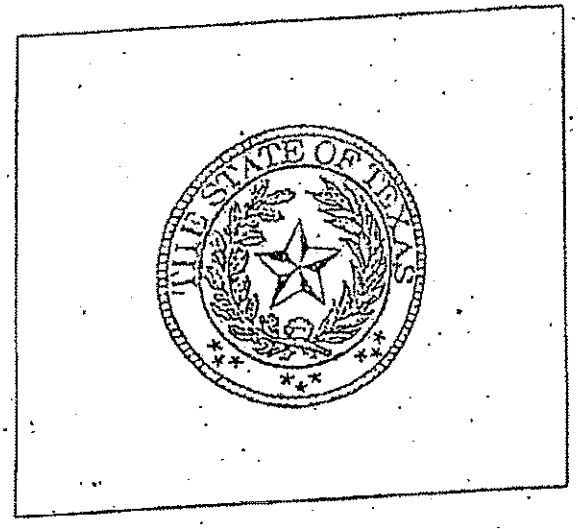

John Hall, Chairman
Pam Reed, Commissioner
Peggy Garner, Commissioner
Dan Pearson, Executive Director

Compiled by TNRCC Chemical Section Engineers
November 1994

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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, lb/MM Btu	CO lb/MM Btu
Steam Assisted	High Btu (>1000/scf)	0.0465	0.3503
Steam Assisted	Low Btu (192-1000/scf)	0.0660	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.

Compressor Blowdown Gas

COMPONENT	mole %	MOLE FRACTION	MW	fuel weight	WT frac	Wt %	dh*	mol fac x dh
Nitrogen	0.5300	0.005	28.0134	0.15	0.0035	**0.3506**	0	0.00
Hydrogen Sulfide	0.0000	0.000	34.08	0.00	0.0000	**0.0000**	637.1	0.00
Carbon Dioxide	91.7500	0.918	44.01	40.38	0.9534	**95.3440**	0	0.00
Methane	5.7400	0.057	16.043	0.92	0.0217	**2.1744**	1010	57.97
Ethane	0.7700	0.008	30.07	0.23	0.0055	**0.5467**	1769.6	13.63
Propane	0.5700	0.006	44.097	0.25	0.0059	**0.5935**	2516.1	14.34
I-Butane	0.1100	0.001	58.123	0.06	0.0015	**0.1510**	3251.9	3.58
N-Butane	0.2700	0.003	58.123	0.16	0.0037	**0.3706**	3262.3	8.81
I-Pentane	0.1100	0.001	72.15	0.08	0.0019	**0.1874**	4000.9	4.40
N-Pentane	0.0900	0.001	72.15	0.06	0.0015	**0.1533**	4008.9	3.61
Other hexanes	0.0383	0.000	86.177	0.03	0.0008	**0.0780**	4750.3	1.82
N-hexane	0.0089	0.000	86.177	0.01	0.0002	**0.0181**	4755.9	0.42
heptane	0.0041	0.000	100.204	0.00	0.0001	**0.0098**	5502.5	0.23
iso-octane	0.0016	0.000	114.231	0.00	0.0000	**0.0043**	6231.7	0.10
octanes+	0.0029	0.000	144.231	0.00	0.0001	**0.0098**	6500	0.19
benzene	0.0020	0.000	78.114	0.00	0.0000	**0.0037**	3741.8	0.07
toluene	0.0017	0.000	92.141	0.00	0.0000	**0.0037**	4475	0.08
ethylbenzene	0.0001	0.000	106.167	0.00	0.0000	**0.0002**	5222.2	0.00
xylene	0.0004	0.000	106.167	0.00	0.0000	**0.0011**	5208.8	0.02
TOTALS	**100.0000**	**1.000**		**42.35**	**1.0000**	**100.0000**		***109***
				sg	**1.460**			
hexanes+	0.0600			**VOC wt%**	**1.5843**			
				Toxic wt%	**0.0311**			

Tank Emission Calculations Based on AP 42 Chapter 7 (June 2020, Section 7.1.3.1), Fixed Roof

Tank ID	**29-09-OST-CV**
Tank Description	**5000 BBL Dry Oil Tank (V-119C)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**38.60**
Vertical Height/Horizontal Length (H_S ft)	**24.10**
Roof Height (H_R ft)	**1.21**
Max Liquid Height (H_{LX} ft)	**23.10**
Avg Liquid Height (H_L ft)	**11.55**
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)	**0.58**
Roof Paint Solar Absorptance (R_A)	**0.58**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.4021**

Tank Shell Color/Shade	**Gray - Light**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Gray - Light**
Tank Roof Paint Condition	**average**
Roof Type	**vertical tank with cone roof**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**912,500.00**
Annual Turnovers, N	**189.51**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**27,031.89**
vapor space outage (H_{VO} ft)	**12.952**
vapor space volume (V_V ft^3)	**15,156.68**

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**	**40.9**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**40.9**
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)	48.11	51.86	59.38	67.57	76.11	82.62	85.03	84.52	78.74	67.70	56.70	49.26	67.30
average vapor temperature (T_V °F)	51.12	55.85	64.64	74.34	83.52	90.41	92.59	91.62	84.80	72.55	60.25	52.05	72.81
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)	22.81	27.10	31.42	36.12	36.73	37.35	36.14	35.31	32.98	30.88	26.44	22.75	31.33
daily average liquid surface temperature (T_{LA} °F)	49.62	53.85	62.01	70.95	79.81	86.52	88.81	88.07	81.77	70.12	58.48	50.66	70.05
daily maximum liquid surface temperature (T_{LX} °F)	55.32	60.63	69.87	79.98	89.00	95.85	97.85	96.90	90.02	77.84	65.09	56.35	77.88
daily minimum liquid surface temperature (T_{LN} °F)	43.91	47.08	54.16	61.92	70.63	77.18	79.78	79.24	73.53	62.40	51.87	44.97	62.22
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	3.156	3.425	3.994	4.701	5.496	6.165	6.408	6.329	5.685	4.632	3.739	3.221	4.626
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	3.522	3.893	4.611	5.512	6.428	7.201	7.438	7.324	6.538	5.311	4.227	3.592	5.315
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	2.821	3.003	3.445	3.988	4.674	5.249	5.493	5.442	4.922	4.023	3.297	2.881	4.009
daily vapor pressure range (ΔP_V)	0.7012	0.8894	1.1655	1.5247	1.7533	1.9510	1.9456	1.8823	1.6163	1.2876	0.9302	0.7107	1.3053
vapor space expansion factor (K_E)	0.1064	0.1328	0.1708	0.2231	0.2620	0.3014	0.3052	0.2938	0.2435	0.1883	0.1372	0.1074	0.1909
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	435,085	392,980	435,085	421,050	435,085	421,050	435,085	435,085	421,050	435,085	421,050	435,085	5,122,775
monthly turnovers (N/month) with avg = total annual	16.10	14.54	16.10	15.58	16.10	15.58	16.10	16.10	15.58	16.10	15.58	16.10	189.51
vented vapor saturation factor (K_S)	0.3158	0.2984	0.2672	0.2366	0.2095	0.1911	0.1852	0.1871	0.2040	0.2393	0.2804	0.3114	0.2395
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	0.0355	0.0410	0.0471	0.0522	0.0541	0.0535	0.0487	0.0405	0.0335	0.0293	0.0405
standing storage losses (L_S lb/month & avg is lb/yr)	618.35	600.54	762.33	852.56	1012.54	1085.29	1161.06	1148.75	1011.20	870.86	696.44	629.83	10449.75
working losses (L_W lb/month & avg is lb/yr)	9395.10	9124.46	11582.78	12953.69	15384.30	16489.77	17640.95	17453.84	15363.95	13231.68	10581.58	9569.53	158771.63
total losses (L_T lb/month & avg is lb/yr)	10013.45	9724.99	12345.12	13806.26	16396.84	17575.07	18802.01	18602.58	16375.14	14102.54	11278.02	10199.36	169221.38
max hourly Q in bbl/hour	584.79	584.79	584.79	584.79	584.79	584.79	584.79	584.79	584.79	584.79	584.79	584.79	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	12.628	13.578	15.568	17.991	20.678	22.902	23.711	23.459	21.339	17.785	14.697	12.862	
breathing/standing loss (L_S lb/hr)	0.831	0.894	1.025	1.367	1.634	1.900	1.930	1.857	1.526	1.171	0.967	0.847	
max hourly total loss (L_T lb/hr)	13.459	14.472	16.593	19.358	22.312	24.802	25.641	25.316	22.865	18.955	15.664	13.709	

L_S sum months	L_W sum months	L_T sum months
10449.75	158771.63	169221.38

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	**1.168**	**1.930**	**10,235.727**
Working Loss L_W	**17.753**	**23.711**	**155,519.869**
Total Loss L_T	**18.922**	**25.641**	**165,755.597**

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	**30-09-IOT-CV**
Tank Description	**1500 BBL Inhibitor Oil Tank-Vent (V-133C)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**21.50**
Vertical Height/Horizontal Length (H_S ft)	**24.10**
Roof Height (H_R ft)	**0.67**
Max Liquid Height (H_{LX} ft)	**23.10**
Avg Liquid Height (H_L ft)	**11.55**
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)	**0.58**
Roof Paint Solar Absorptance (R_A)	**0.58**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.2240**

Tank Shell Color/Shade	**Gray - Light**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Gray - Light**
Tank Roof Paint Condition	**average**
Roof Type	**vertical tank with cone roof**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**17,140.00**
Annual Turnovers, N	**11.47**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**8,386.46**
vapor space outage (H_{VO} ft)	**12.774**
vapor space volume (V_V ft^3)	**4,637.59**

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**	**40.9**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**40.9**
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)	48.11	51.86	59.38	67.57	76.11	82.62	85.03	84.52	78.74	67.70	56.70	49.26	67.30
average vapor temperature (T_V °F)	50.70	55.29	63.91	73.39	82.48	89.31	91.53	90.63	83.95	71.87	59.75	51.66	72.03
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)	23.33	27.38	31.42	36.12	36.73	37.35	36.14	35.31	32.98	30.88	27.01	23.36	31.33
daily average liquid surface temperature (T_{LA} °F)	49.41	53.57	61.64	70.48	79.29	85.97	88.28	87.57	81.35	69.78	58.23	50.46	69.66
daily maximum liquid surface temperature (T_{LX} °F)	55.24	60.42	69.50	79.51	88.48	95.31	97.31	96.40	89.59	77.50	64.98	56.30	77.50
daily minimum liquid surface temperature (T_{LN} °F)	43.57	46.73	53.79	61.45	70.11	76.63	79.24	78.75	73.10	62.06	51.48	44.62	61.83
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	3.143	3.407	3.967	4.661	5.447	6.108	6.351	6.276	5.644	4.603	3.722	3.209	4.594
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	3.517	3.878	4.580	5.467	6.372	7.136	7.374	7.265	6.492	5.279	4.219	3.589	5.279
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	2.802	2.983	3.421	3.953	4.631	5.199	5.442	5.395	4.885	3.998	3.272	2.861	3.981
daily vapor pressure range (ΔP_V)	0.7147	0.8947	1.1591	1.5145	1.7409	1.9369	1.9321	1.8700	1.6070	1.2814	0.9468	0.7275	1.2982
vapor space expansion factor (K_E)	0.1085	0.1337	0.1699	0.2215	0.2597	0.2982	0.3020	0.2909	0.2417	0.1873	0.1397	0.1100	0.1898
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	8,172	7,382	8,172	7,909	8,172	7,909	8,172	8,172	7,909	8,172	7,909	8,172	96,224
monthly turnovers (N/month) with avg = total annual	0.97	0.88	0.97	0.94	0.97	0.94	0.97	0.97	0.94	0.97	0.94	0.97	11.47
vented vapor saturation factor (K_S)	0.3197	0.3024	0.2713	0.2406	0.2133	0.1947	0.1887	0.1905	0.2074	0.2429	0.2841	0.3152	0.2433
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)	0.0287	0.0308	0.0353	0.0407	0.0468	0.0518	0.0537	0.0531	0.0484	0.0404	0.0334	0.0292	0.0403
standing storage losses (L_S lb/month & avg is lb/yr)	190.48	184.80	234.32	261.71	310.71	332.98	356.33	352.69	310.72	267.84	214.44	194.06	3211.07
working losses (L_W lb/month & avg is lb/yr)	175.89	170.66	216.38	241.68	286.92	307.49	329.05	325.69	286.93	247.34	198.02	179.21	2965.27
total losses (L_T lb/month & avg is lb/yr)	366.37	355.46	450.71	503.39	597.63	640.48	685.38	678.38	597.65	515.18	412.46	373.27	6176.35
max hourly Q in bbl/hour	10.98	10.98	10.98	10.98	10.98	10.98	10.98	10.98	10.98	10.98	10.98	10.98	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.236	0.254	0.291	0.336	0.386	0.427	0.442	0.438	0.399	0.332	0.275	0.241	
breathing/standing loss (L_S lb/hr)	0.256	0.275	0.315	0.420	0.501	0.582	0.591	0.569	0.469	0.360	0.298	0.261	
max hourly total loss (L_T lb/hr)	0.492	0.529	0.606	0.755	0.887	1.009	1.033	1.007	0.867	0.692	0.573	0.502	

L_S sum months	L_W sum months	L_T sum months
3211.07	2965.27	6176.35

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	**0.359**	**0.591**	**3,145.985**
Working Loss L_W	**0.332**	**0.442**	**2,905.166**
Total Loss L_T	**0.691**	**1.033**	**6,051.151**

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	**35a-13-WST-CV & 35b-13-WST-CV**
Tank Description	**400 BBL Water Storage Tank (V-154A/B)**
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)	**0.58**
Roof Paint Solar Absorptance (R_A)	**0.58**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.1250**

Tank Shell Color/Shade	**Gray - Light**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Gray - Light**
Tank Roof Paint Condition	**average**
Roof Type	**vertical tank with cone roof**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**0.00**
Annual Turnovers, N	**0.00**
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	**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*
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)	48.11	51.86	59.38	67.57	76.11	82.62	85.03	84.52	78.74	67.70	56.70	49.26	67.30
average vapor temperature (T_V °F)	50.43	54.93	63.43	72.77	81.81	88.61	90.85	89.98	83.40	71.43	59.43	51.41	71.53
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)	23.66	27.65	31.42	36.12	36.73	37.35	36.14	35.31	32.98	31.09	27.38	23.75	31.33
daily average liquid surface temperature (T_{LA} °F)	49.27	53.39	61.41	70.17	78.96	85.62	87.94	87.25	81.07	69.56	58.07	50.34	69.41
daily maximum liquid surface temperature (T_{LX} °F)	55.18	60.31	69.26	79.20	88.14	94.95	96.97	96.08	89.32	77.33	64.91	56.27	77.25
daily minimum liquid surface temperature (T_{LN} °F)	43.35	46.48	53.55	61.14	69.78	76.28	78.90	78.42	72.83	61.79	51.22	44.40	61.58
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	0.173	0.202	0.269	0.365	0.490	0.608	0.655	0.641	0.525	0.358	0.239	0.180	0.356
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	0.215	0.259	0.354	0.494	0.659	0.815	0.867	0.843	0.684	0.465	0.305	0.224	0.463
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	0.138	0.156	0.203	0.267	0.360	0.449	0.489	0.482	0.400	0.273	0.186	0.144	0.271
daily vapor pressure range (ΔP_V)	0.0770	0.1031	0.1512	0.2273	0.2985	0.3661	0.3773	0.3617	0.2841	0.1916	0.1185	0.0801	0.1923
vapor space expansion factor (K_E)	0.0519	0.0611	0.0709	0.0842	0.0894	0.0948	0.0932	0.0906	0.0813	0.0723	0.0612	0.0522	0.0728
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	0	0	0	0	0	0	0	0	0	0	0	0	0
monthly turnovers (N/month) with avg = total annual	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
vented vapor saturation factor (K_S)	0.9112	0.8980	0.8683	0.8294	0.7837	0.7449	0.7306	0.7349	0.7717	0.8323	0.8814	0.9079	0.8330
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)	1.29	1.34	1.95	2.52	3.43	4.07	4.51	4.42	3.55	2.55	1.69	1.34	32.66
working losses (L_W lb/month & avg is lb/yr)	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
total losses (L_T lb/month & avg is lb/yr)	1.29	1.34	1.95	2.52	3.43	4.07	4.51	4.42	3.55	2.55	1.69	1.34	32.66
max hourly Q in bbl/hour	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
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)	0.002	0.002	0.003	0.004	0.005	0.007	0.007	0.007	0.005	0.003	0.002	0.002	
max hourly total loss (L_T lb/hr)	0.002	0.002	0.003	0.004	0.005	0.007	0.007	0.007	0.005	0.003	0.002	0.002	

L_S sum months	L_W sum months	L_T sum months
32.66	0.00	32.66

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	**0.003**	**0.007**	**29.916**
Working Loss L_W	**0.000**	**0.000**	**0.000**
Total Loss L_T	**0.003**	**0.007**	**29.916**

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	**36-13-GST**
Tank Description	**100 BBL Glycol Storage Tank (V-136)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Horizontal**
Tank Diameter (D ft)	**7.00**
Vertical Height/Horizontal Length (H_S ft)	**15.00**
Roof Height (H_R ft)	
Max Liquid Height (H_{LX} ft)	**7.00**
Avg Liquid Height (H_L ft)	**3.50**
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	**2.32**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**577.27**
vapor space outage (H_{VO} ft)	**2.749**
vapor space volume (V_V ft^3)	**288.63**

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)	52.21	57.30	66.55	76.79	86.20	93.22	95.33	94.20	86.99	74.30	61.53	53.06	74.80
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	27.41	40.51
daily average liquid surface temperature (T_{LA} °F)	50.54	55.08	63.62	73.02	82.08	88.90	91.12	90.24	83.62	71.60	59.56	51.51	71.74
daily maximum liquid surface temperature (T_{LX} °F)	57.47	63.51	73.67	84.87	94.35	101.47	103.31	102.03	94.39	81.34	67.63	58.36	81.86
daily minimum liquid surface temperature (T_{LN} °F)	43.60	46.64	53.58	61.17	69.81	76.32	78.94	78.46	72.86	61.87	51.49	44.66	61.61
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	1.486	1.679	2.099	2.657	3.304	3.870	4.071	3.991	3.425	2.566	1.890	1.526	2.574
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	1.790	2.094	2.699	3.527	4.377	5.120	5.327	5.182	4.381	3.247	2.324	1.832	3.287
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	1.227	1.335	1.613	1.971	2.454	2.879	3.066	3.031	2.646	2.007	1.525	1.264	1.993
daily vapor pressure range (ΔP_V)	0.5628	0.7582	1.0859	1.5556	1.9229	2.2412	2.2611	2.1511	1.7352	1.2399	0.7987	0.5682	1.2933
vapor space expansion factor (K_E)	0.0975	0.1245	0.1641	0.2199	0.2618	0.3018	0.3045	0.2897	0.2354	0.1769	0.1253	0.0973	0.1843
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	114	103	114	110	114	110	114	114	110	114	110	114	1,337
monthly turnovers (N/month) with avg = total annual	0.20	0.18	0.20	0.19	0.20	0.19	0.20	0.20	0.19	0.20	0.19	0.20	2.32
vented vapor saturation factor (K_S)	0.8220	0.8034	0.7658	0.7209	0.6751	0.6395	0.6277	0.6324	0.6671	0.7279	0.7841	0.8181	0.7272
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)	0.0233	0.0261	0.0320	0.0398	0.0486	0.0562	0.0589	0.0579	0.0503	0.0386	0.0291	0.0239	0.0387
standing storage losses (L_S lb/month & avg is lb/yr)	27.97	28.27	38.43	46.18	58.30	65.25	70.67	69.41	58.42	46.29	33.81	28.67	571.68
working losses (L_W lb/month & avg is lb/yr)	2.65	2.68	3.64	4.37	5.52	6.18	6.69	6.57	5.53	4.38	3.20	2.71	54.10
total losses (L_T lb/month & avg is lb/yr)	30.62	30.94	42.07	50.55	63.82	71.43	77.35	75.98	63.95	50.67	37.01	31.39	625.78
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)	0.004	0.004	0.005	0.006	0.007	0.009	0.009	0.009	0.008	0.006	0.004	0.004	
breathing/standing loss (L_S lb/hr)	0.038	0.042	0.052	0.076	0.103	0.130	0.135	0.127	0.095	0.062	0.047	0.039	
max hourly total loss (L_T lb/hr)	0.041	0.046	0.057	0.082	0.111	0.139	0.144	0.136	0.103	0.068	0.051	0.042	

L_S sum months	L_W sum months	L_T sum months
571.68	54.10	625.78

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	**0.062**	**0.135**	**546.334**
Working Loss L_W	**0.006**	**0.009**	**51.703**
Total Loss L_T	**0.068**	**0.144**	**598.038**

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	**37-13-CST**
Tank Description	**Organic Chemical Blend Storage Tank (<550 Gallons)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Horizontal**
Tank Diameter (D ft)	**4.00**
Vertical Height/Horizontal Length (H_S ft)	**5.90**
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	**3.61**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**74.14**
vapor space outage (H_{VO} ft)	**1.571**
vapor space volume (V_V ft^3)	**37.07**

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):

component	*mole%*	*MW*	*lb/mole*	*wt%*	*Antoine constants (log_{10}, mmHg, °C) 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)	52.58	57.79	67.20	77.62	87.12	94.18	96.26	95.07	87.74	74.90	61.97	53.41	75.48
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	27.26	40.51
daily average liquid surface temperature (T_{LA} °F)	50.72	55.32	63.95	73.44	82.54	89.37	91.59	90.68	84.00	71.90	59.78	51.68	72.08
daily maximum liquid surface temperature (T_{LX} °F)	57.66	63.76	73.99	85.29	94.81	101.95	103.78	102.47	94.76	81.64	67.85	58.50	82.20
daily minimum liquid surface temperature (T_{LN} °F)	43.79	46.88	53.90	61.59	70.27	76.80	79.40	78.90	73.23	62.16	51.71	44.87	61.95
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	1.494	1.690	2.117	2.684	3.339	3.912	4.114	4.030	3.455	2.585	1.901	1.533	2.596
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	1.798	2.107	2.721	3.561	4.422	5.174	5.381	5.231	4.418	3.269	2.337	1.838	3.313
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	1.233	1.344	1.627	1.992	2.482	2.913	3.100	3.063	2.671	2.022	1.534	1.271	2.011
daily vapor pressure range (ΔP_V)	0.5651	0.7623	1.0933	1.5685	1.9397	2.2610	2.2804	2.1684	1.7475	1.2473	0.8025	0.5673	1.3022
vapor space expansion factor (K_E)	0.0977	0.1249	0.1648	0.2212	0.2637	0.3044	0.3072	0.2920	0.2369	0.1776	0.1256	0.0969	0.1852
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	0.31	0.28	0.31	0.30	0.31	0.30	0.31	0.31	0.30	0.31	0.30	0.31	3.61
vented vapor saturation factor (K_S)	0.8894	0.8766	0.8502	0.8173	0.7825	0.7543	0.7449	0.7488	0.7766	0.8229	0.8634	0.8868	0.8223
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)	0.0234	0.0262	0.0323	0.0401	0.0490	0.0567	0.0594	0.0583	0.0507	0.0388	0.0293	0.0240	0.0390
standing storage losses (L_S lb/month & avg is lb/yr)	4.10	4.15	5.65	6.80	8.58	9.61	10.40	10.21	8.59	6.80	4.96	4.20	84.05
working losses (L_W lb/month & avg is lb/yr)	0.53	0.54	0.73	0.88	1.11	1.25	1.35	1.32	1.11	0.88	0.64	0.54	10.90
total losses (L_T lb/month & avg is lb/yr)	4.63	4.69	6.38	7.68	9.70	10.86	11.75	11.54	9.70	7.68	5.60	4.75	94.95
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	0.001	0.002	0.002	0.002	0.002	0.001	0.001	0.001	
breathing/standing loss (L_S lb/hr)	0.006	0.006	0.008	0.011	0.016	0.020	0.021	0.020	0.014	0.009	0.007	0.006	
max hourly total loss (L_T lb/hr)	0.006	0.007	0.009	0.012	0.017	0.022	0.023	0.021	0.016	0.010	0.008	0.006	

L_S sum months	L_W sum months	L_T sum months
84.05	10.90	94.95

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	**0.009**	**0.021**	**80.289**
Working Loss L_W	**0.001**	**0.002**	**10.414**
Total Loss L_T	**0.010**	**0.023**	**90.703**

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	**38-13-CST**
Tank Description	**Organic Chemical Blend Storage Tank (<2,000 Gallons)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Horizontal**
Tank Diameter (D ft)	**5.90**
Vertical Height/Horizontal Length (H_S ft)	**10.00**
Roof Height (H_R ft)	
Max Liquid Height (H_{LX} ft)	**5.90**
Avg Liquid Height (H_L ft)	**2.95**
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)	**5,000.00**
Annual Turnovers, N	**102.67**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**273.40**
vapor space outage (H_{VO} ft)	**2.317**
vapor space volume (V_V ft^3)	**136.70**

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	**0.459**

*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*
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)	52.44	57.60	66.95	77.30	86.76	93.81	95.90	94.73	87.45	74.67	61.80	53.27	75.22
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	27.32	40.51
daily average liquid surface temperature (T_{LA} °F)	50.65	55.23	63.82	73.28	82.36	89.19	91.41	90.51	83.85	71.79	59.69	51.62	71.94
daily maximum liquid surface temperature (T_{LX} °F)	57.59	63.66	73.87	85.13	94.63	101.77	103.60	102.30	94.62	81.53	67.76	58.45	82.07
daily minimum liquid surface temperature (T_{LN} °F)	43.72	46.79	53.78	61.43	70.09	76.61	79.22	78.73	73.09	62.05	51.62	44.79	61.82
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	1.491	1.686	2.110	2.674	3.325	3.896	4.097	4.015	3.444	2.578	1.897	1.530	2.587
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	1.795	2.102	2.712	3.548	4.405	5.153	5.360	5.212	4.404	3.261	2.332	1.836	3.303
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	1.231	1.341	1.622	1.984	2.472	2.900	3.087	3.051	2.661	2.016	1.531	1.268	2.004
daily vapor pressure range (ΔP_V)	0.5642	0.7607	1.0904	1.5635	1.9332	2.2533	2.2729	2.1617	1.7427	1.2445	0.8010	0.5677	1.2988
vapor space expansion factor (K_E)	0.0976	0.1247	0.1645	0.2207	0.2630	0.3034	0.3062	0.2911	0.2363	0.1774	0.1255	0.0971	0.1849
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	2,384	2,153	2,384	2,307	2,384	2,307	2,384	2,384	2,307	2,384	2,307	2,384	28,070
monthly turnovers (N/month) with avg = total annual	8.72	7.88	8.72	8.44	8.72	8.44	8.72	8.72	8.44	8.72	8.44	8.72	102.67
vented vapor saturation factor (K_S)	0.8453	0.8285	0.7942	0.7528	0.7101	0.6764	0.6653	0.6698	0.7028	0.7596	0.8111	0.8418	0.7589
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)	0.0234	0.0262	0.0322	0.0400	0.0489	0.0565	0.0592	0.0582	0.0505	0.0387	0.0292	0.0240	0.0388
standing storage losses (L_S lb/month & avg is lb/yr)	13.90	14.06	19.13	23.01	29.06	32.53	35.22	34.58	29.09	23.03	16.81	14.25	284.66
working losses (L_W lb/month & avg is lb/yr)	25.58	25.87	35.20	42.33	53.46	59.84	64.79	63.62	53.51	42.38	30.92	26.21	523.73
total losses (L_T lb/month & avg is lb/yr)	39.48	39.93	54.33	65.34	82.52	92.37	100.01	98.20	82.60	65.41	47.73	40.46	808.39
max hourly Q in bbl/hour	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.075	0.084	0.103	0.128	0.157	0.181	0.190	0.186	0.162	0.124	0.094	0.077	
breathing/standing loss (L_S lb/hr)	0.019	0.021	0.026	0.038	0.052	0.066	0.069	0.065	0.048	0.031	0.023	0.019	
max hourly total loss (L_T lb/hr)	0.094	0.105	0.129	0.166	0.209	0.247	0.259	0.251	0.210	0.155	0.117	0.096	

L_S sum months	L_W sum months	L_T sum months
284.66	523.73	808.39

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	**0.031**	**0.069**	**271.976**
Working Loss L_W	**0.057**	**0.190**	**500.390**
Total Loss L_T	**0.088**	**0.259**	**772.366**

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	**39-13-CST**
Tank Description	**Organic Chemical Blend Storage Tank (<800 Gallons)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Horizontal**
Tank Diameter (D ft)	**4.20**
Vertical Height/Horizontal Length (H_S ft)	**8.00**
Roof Height (H_R ft)	
Max Liquid Height (H_{LX} ft)	**4.20**
Avg Liquid Height (H_L ft)	**2.10**
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)	**1,000.00**
Annual Turnovers, N	**50.65**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**110.84**
vapor space outage (H_{VO} ft)	**1.649**
vapor space volume (V_V ft^3)	**55.42**

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	**0.759**

*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*
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)	52.32	57.44	66.74	77.04	86.48	93.51	95.61	94.46	87.22	74.48	61.66	53.17	75.01
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	27.37	40.51
daily average liquid surface temperature (T_{LA} °F)	50.59	55.15	63.72	73.15	82.22	89.04	91.26	90.38	83.74	71.69	59.63	51.56	71.84
daily maximum liquid surface temperature (T_{LX} °F)	57.53	63.59	73.77	85.00	94.49	101.62	103.45	102.16	94.50	81.43	67.69	58.40	81.97
daily minimum liquid surface temperature (T_{LN} °F)	43.66	46.71	53.67	61.30	69.95	76.46	79.08	78.59	72.97	61.96	51.56	44.72	61.71
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	1.488	1.683	2.105	2.665	3.314	3.882	4.084	4.003	3.434	2.572	1.893	1.528	2.581
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	1.792	2.097	2.706	3.537	4.391	5.136	5.343	5.197	4.392	3.253	2.328	1.834	3.295
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	1.229	1.338	1.618	1.978	2.463	2.889	3.076	3.041	2.654	2.011	1.528	1.266	1.999
daily vapor pressure range (ΔP_V)	0.5635	0.7595	1.0881	1.5595	1.9280	2.2471	2.2669	2.1563	1.7389	1.2421	0.7999	0.5680	1.2960
vapor space expansion factor (K_E)	0.0976	0.1246	0.1643	0.2203	0.2623	0.3026	0.3053	0.2904	0.2359	0.1771	0.1254	0.0972	0.1846
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	477	431	477	461	477	461	477	477	461	477	461	477	5,614
monthly turnovers (N/month) with avg = total annual	4.30	3.89	4.30	4.16	4.30	4.16	4.30	4.30	4.16	4.30	4.16	4.30	50.65
vented vapor saturation factor (K_S)	0.8849	0.8718	0.8446	0.8110	0.7754	0.7466	0.7369	0.7408	0.7691	0.8165	0.8580	0.8822	0.8159
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)	0.0233	0.0261	0.0321	0.0399	0.0487	0.0564	0.0591	0.0580	0.0504	0.0387	0.0292	0.0239	0.0388
standing storage losses (L_S lb/month & avg is lb/yr)	6.04	6.11	8.31	9.99	12.61	14.12	15.29	15.01	12.63	10.01	7.30	6.19	123.60
working losses (L_W lb/month & avg is lb/yr)	8.45	8.54	11.62	13.97	17.64	19.74	21.37	20.99	17.66	13.99	10.21	8.66	172.84
total losses (L_T lb/month & avg is lb/yr)	14.49	14.65	19.93	23.95	30.25	33.85	36.66	36.00	30.29	24.00	17.52	14.85	296.45
max hourly Q in bbl/hour	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.015	0.017	0.021	0.026	0.031	0.036	0.038	0.037	0.032	0.025	0.019	0.015	
breathing/standing loss (L_S lb/hr)	0.008	0.009	0.011	0.016	0.023	0.029	0.031	0.029	0.021	0.013	0.010	0.008	
max hourly total loss (L_T lb/hr)	0.023	0.026	0.032	0.042	0.054	0.066	0.069	0.066	0.053	0.038	0.029	0.024	

L_S sum months	L_W sum months	L_T sum months
123.60	172.84	296.45

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	**0.013**	**0.031**	**118.110**
Working Loss L_W	**0.019**	**0.038**	**165.161**
Total Loss L_T	**0.032**	**0.069**	**283.271**

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	**42-14-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			

	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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Tank Emission Calculations Based on AP 42 Chapter 7 (June 2020, Section 7.1.3.1), Fixed Roof

Tank ID	**43-14-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)	**214.29**
Annual Turnovers, N	**8.75**
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			

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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)	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	102	92	102	99	102	99	102	102	99	102	99	102	1,203
monthly turnovers (N/month) with avg = total annual	0.74	0.67	0.74	0.72	0.74	0.72	0.74	0.74	0.72	0.74	0.72	0.74	8.75
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)	6.72	6.56	8.38	9.45	11.24	12.06	12.88	12.71	11.14	9.54	7.58	6.83	115.09
total losses (L_T lb/month & avg is lb/yr)	51.72	50.52	64.55	72.73	86.56	92.86	99.19	97.91	85.78	73.49	58.39	52.60	886.30
max hourly Q in bbl/hour	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.009	0.010	0.011	0.013	0.015	0.017	0.017	0.017	0.015	0.013	0.011	0.009	
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)	0.070	0.075	0.087	0.120	0.190	0.305	0.358	0.319	0.183	0.099	0.081	0.071	

L_S sum months	L_W sum months	L_T sum months
771.21	115.09	886.30

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	**0.013**	**0.017**	**112.590**
Total Loss L_T	**0.099**	**0.358**	**867.042**

max hourly total loss may not add up to L_S + L_W as their max values may be in different months

HLP engineering.inc.
A Professional Environmental Firm

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	

Treater FG

Certificate of Analysis

Number: 2030-13110169-005A

Carencro Laboratory
4790 NE Evangeline Thruway
Carencro, LA 70520

Nov. 27, 2013

Denbury Resources
5320 Legacy Drive
Plano, TX 75024

Field: Mallalieu
Station Name: EOR Last Vessel Dump to Water Tank
Sample Point: Sample Valve
Cylinder No: 3324

Sampled By: JB-FSC
Sample Of: Liquid Spot
Sample Date: 11/05/2013 14:10
Sample Conditions: 200 psig, @ 78 °F

Analytical Data

Test	Method	Result	Units	Detection Limit	Lab Tech.	Analysis Date
Color Visual	Proprietary	CRUDE			AR	11/20/2013
API Gravity @ 60° F	ASTM D-5002	9.47	°		AR	11/20/2013
Specific Gravity @ 60/60° F	ASTM D-5002	0.8276			AR	11/20/2013
Density @ 60° F	ASTM D-5002	0.8268	g/ml		AR	11/20/2013
Shrinkage Factor	Proprietary	0.9758			AR	11/20/2013
Flash Factor	Proprietary	95.5289	Cu. Ft./S.T. Bbl			

Hydrocarbon Laboratory Manager

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

LAFAYETTE AREA LABORATORY
4790 N.E. EVANGELINE THRUWAY
CARENCRO, LA 70520
PHONE (337) 896-3055
FAX (337) 896-3077

CERTIFICATE OF ANALYSIS

Certificate of Analysis: 13110169-005A

Customer:	Denbury Resources, Inc	**Report Date:**	11/27/13
Attn:			
	5320 Legacy Dr.	**PO / Ref. No.:**	
	Plano TX 75024		

Company:	Denbury Resources, Inc	**Sample Of:**	Flash Gas
Field:	Mallalieu	**Sample Date/Time:**	11/05/13
Station:	EOR Last Vessel	**Sample Psig & Temp:**	200 psi @ 78 °F
Station No:		**Sampled By:**	JB-FSC
Sample Point:	Dump to Water Tank	**Cylinder # :**	3324
Comments:	EOS Flash Gas Composition		

	MOL %	WEIGHT %	GPM's @
NITROGEN	90.148	87.760	
CO2	0.667	0.237	
METHANE	1.263	0.840	0.484
ETHANE	2.014	1.964	0.750
PROPANE	0.710	0.913	0.222
I-BUTANE	2.186	2.811	0.711
N-BUTANE	1.001	1.597	0.280
I-PENTANE	0.872	1.392	0.247
N-PENTANE	0.483	0.904	0.121
HEXANES	0.098	0.170	0.036
BENZENE	0.343	0.733	0.076
HEPTANES	0.025	0.050	0.008
TOLUENE	0.096	0.238	0.019
OCTANES	0.002	0.005	0.001
E-BENZENE	0.011	0.025	0.003
m,o,&p-XYLENE	0.018	0.049	0.003
NONANES	0.064	0.311	0.011
DECANES PLUS	100.000	100.000	2.971
TOTALS			

CALCULATED VALUES

REAL DRY BTU AT 15.025 PSIA, 60 DEG.F	310.9
REAL WET BTU AT 15.025 PSIA, 60 DEG.F	305.6
RELATIVE DENSITY	1.571
COMPRESSIBILITY FACTOR	0.99262

	C2+	C5+
GPM's @ 15.025 psia, 60 Deg.F	2.971	0.804