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
Olive EOR Facility
AI No.: 387; Permit No.: 0080-00023
Amite 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 Enterprise Journal. Additionally, a copy of the public notice and the complete OPGP NOI will be provided to the McComb 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

Olive EOR Facility
Amite County, MS

August 2024

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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*) : Olive EOR Facility

C. Facility Air Permit/Coverage No. *(if known)* : 0080-00023

D. Agency Interest No. *(if known)* : 387

E. Physical Address

1. Street Address: 7969 Robert Jones Road
2. City: Summit
3. State: MS
4. County: Amite
5. Zip Code: 39666
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: facility center
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 18 49.60
4. Longitude (*degrees/minutes/seconds*): 90 32 57.90
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	6,000	barrels/day
Water	11,000	barrels/day
Other (Specify)		

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

Produced Material	Throughput	Units
Flared Gas	0.55	MMCF/day
Oil	6,000	barrels/day
Water	11,000	barrels/day
Other (Specify)		

8. Zoning

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

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

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

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

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

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

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

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

10. Address and Location of Facility Records

Physical Address

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

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

Facility (Agency Interest) Information	Section OPGP - A

11. Certification

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

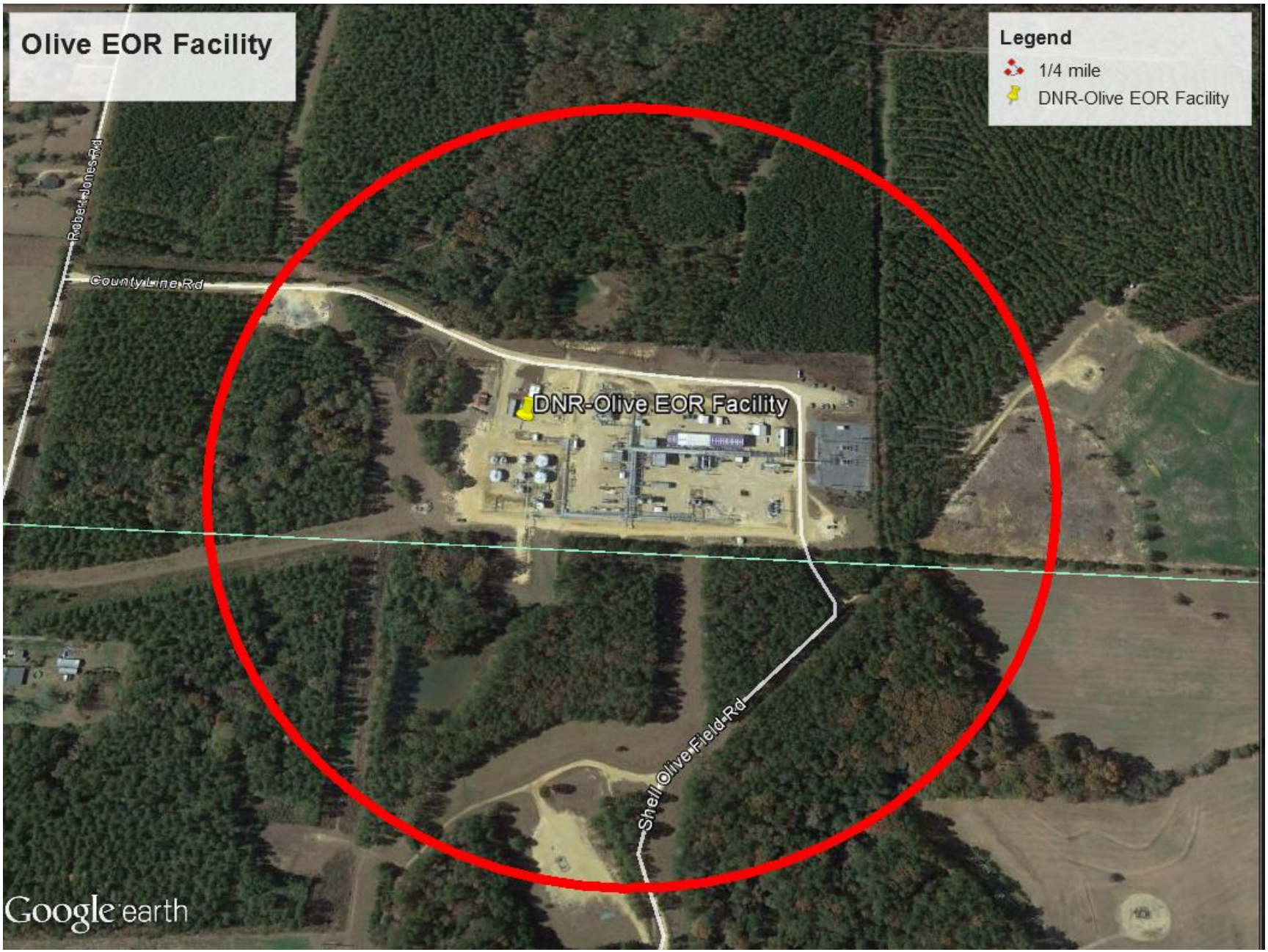
I certify that to the best of my knowledge and belief formed after reasonable inquiry, the statements and information in this application are true, complete, and accurate, and that as a responsible official, my signature shall constitute an agreement that the applicant assumes the responsibility for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

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

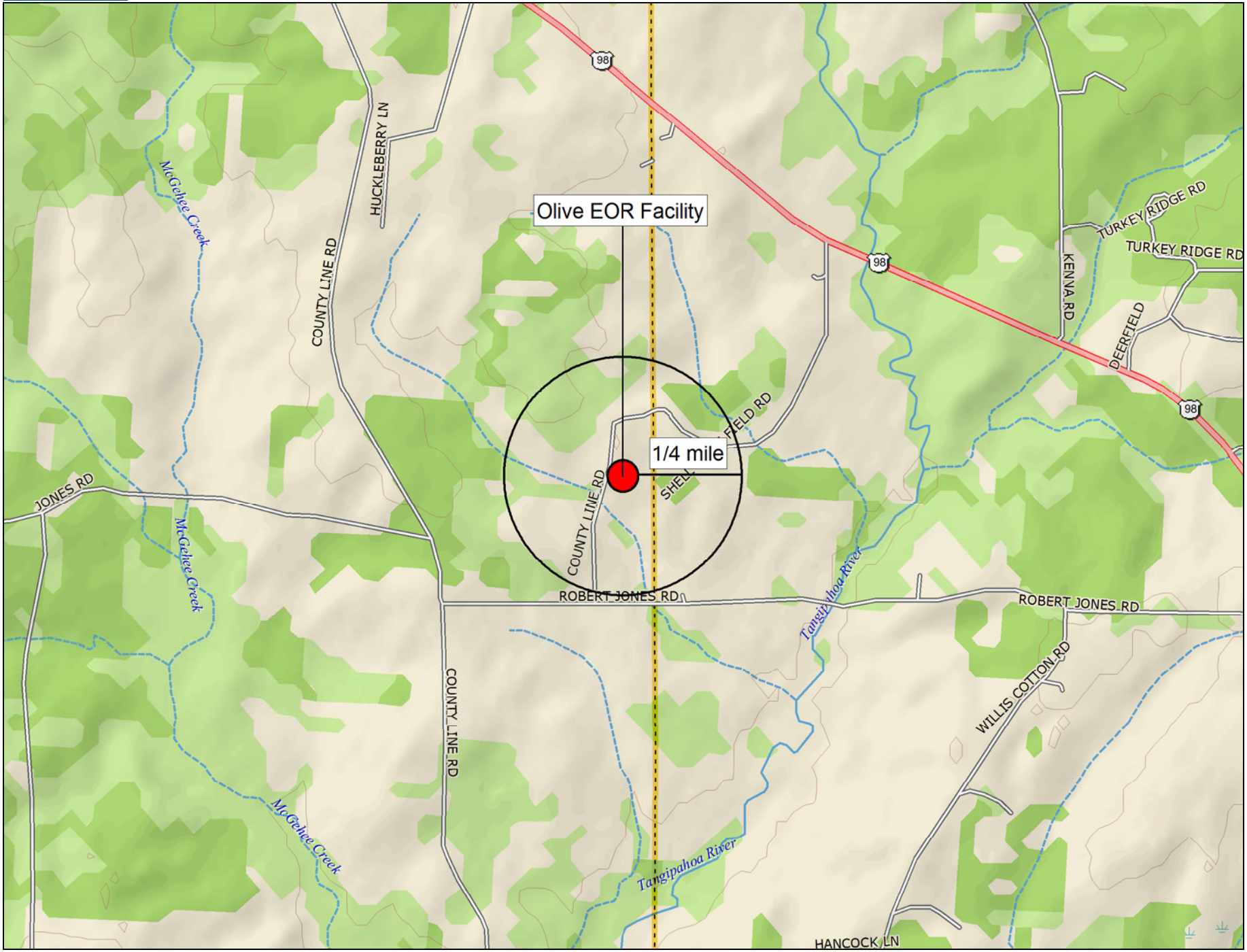
7/30/24 — **Date**

Rusty Shaw — **Printed Name**

7/30/24 — **Date**


Olive EOR Facility
Legend
1/4 mile
DNR-Olive EOR Facility
Robert Jones Rd
County Line Rd
DNR-Olive EOR Facility
Shell Olive Field Rd
Google earth


DNR-Olive EOR Facility
County Line Rd



TN

MN (0.8°W)

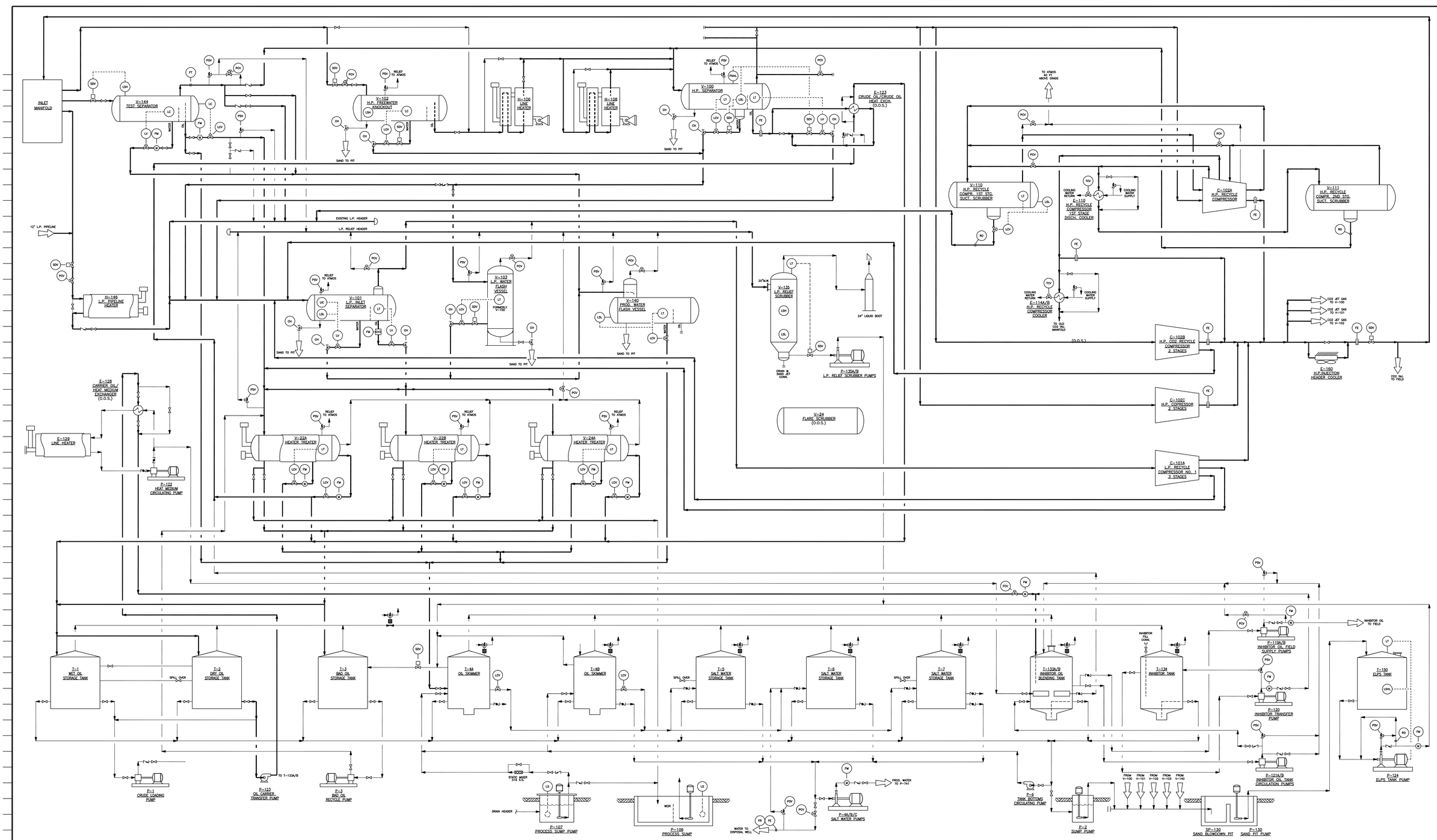
Scale 1 : 20,000

0 600 1200 1800 2400 3000 ft

0 180 360 540 720 900 m

1" = 1,666.7 ft

Data Zoom 13-1



NOTES:

No.	DRN. BY	CHK'D.	APP.	DATE	REVISION DESCRIPTION
A	ADP			6/2/10	ISSUED FOR APPROVAL-2010 EXPANSION PROJECT

JACOBS

PROJECT NUMBER: LUMX-3301

DATE:

Denbury Onshore, LLC

PROJECT MANAGER: R. ROSS	DESCRIPTION: OLIVE MCCOMB CENTRAL FACILITY			
AFE No.:	SO No.:	DATE: 6/2/10	DRN. BY: ADP	SCALE: NTS
CADD. FILE: P:\LUMX4902\ENG\Piping\Process flow diagram\C-SPFD-OM.DWG		CHANGED DATE: 6/2/10	DWG No.: C-SPFD-OM	
DRAWING TITLE: OVERALL FACILITY PROCESS FLOW DIAGRAM			REV. No.: A	REV. DATE: 6/2/10

DWG: P:\DENBURY-OLIVEMCCOMB\LUMX4902\ENG\Piping\Process flow diagram\C-SPFD-OM.dwg USER: malleysa
DATE: Feb 03, 2012 3:47pm

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

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

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

Emission Point ID	TSP[1] (PM)		PM-10[1]		PM-2.5[1]		SO_2		NOx		CO		VOC		TRS[2]		Lead		Total HAPs	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
1-05-HT-BS	0.01	0.04	0.01	0.04	0.01	0.04	0.00	0.01	0.11	0.49	0.09	0.41	0.01	0.03	0.00	0.00	-	-	0.00	0.01
2-05-HT-BS	0.01	0.04	0.01	0.04	0.01	0.04	0.00	0.01	0.11	0.49	0.09	0.41	0.01	0.03	0.00	0.00	-	-	0.00	0.01
3-05-HT-BS	0.03	0.14	0.03	0.14	0.03	0.14	0.00	0.02	0.42	1.86	0.36	1.56	0.02	0.10	0.00	0.00	-	-	0.01	0.03
4-05-FH-BS	0.17	0.74	0.17	0.74	0.17	0.74	0.03	0.12	2.23	9.77	1.87	8.21	0.12	0.54	0.00	0.00	-	-	0.04	0.19
5-05-FH-BS	0.17	0.74	0.17	0.74	0.17	0.74	0.03	0.12	2.23	9.77	1.87	8.21	0.12	0.54	0.00	0.00	-	-	0.04	0.19
6-05-LH-BS	0.04	0.19	0.04	0.19	0.04	0.19	0.01	0.03	0.56	2.44	0.47	2.05	0.03	0.13	0.00	0.00	-	-	0.01	0.04
7-05-LH-BS	0.01	0.03	0.01	0.03	0.01	0.03	0.00	0.00	0.08	0.37	0.07	0.31	0.00	0.02	0.00	0.00	-	-	0.00	0.01
8-05-SBP	-	-	-	-	-	-	-	-	-	-	-	-	0.24	0.09	0.00	0.00	-	-	0.10	0.02
9a-05-OST-CV	-	-	-	-	-	-	-	-	-	-	-	-	47.84	209.54	0.00	0.00	-	-	4.05	17.73
9b-05-OST-CV	-	-	-	-	-	-	-	-	-	-	-	-	47.84	209.54	0.00	0.00	-	-	4.05	17.73
9c-05-OST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.52	2.26	0.00	0.00	-	-	0.05	0.20
9d-05-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	1.79	7.80	0.00	0.00	-	-	0.41	1.83
9e-05-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	1.79	7.80	0.00	0.00	-	-	0.41	1.83
9f-05-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.03	0.13	0.00	0.00	-	-	0.08	0.37
10-05-IOT-V	-	-	-	-	-	-	-	-	-	-	-	-	0.32	1.45	0.00	0.00	-	-	0.03	0.12
11-05-IOT-V	-	-	-	-	-	-	-	-	-	-	-	-	0.49	2.17	0.00	0.00	-	-	0.03	0.13
12-05-OST-V	-	-	-	-	-	-	-	-	-	-	-	-	0.14	0.63	0.00	0.00	-	-	0.01	0.06
13-05-SUMP	-	-	-	-	-	-	-	-	-	-	-	-	0.24	0.09	0.00	0.00	-	-	0.10	0.02
14-05-FE	-	-	-	-	-	-	-	-	-	-	-	-	1.28	5.59	0.00	0.00	-	-	0.00	0.05
15-05-F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17-05-CB	-	-	-	-	-	-	-	-	-	-	-	-	41.00	2.05	0.00	0.00	-	-	0.81	0.03
19-05-CB	-	-	-	-	-	-	-	-	-	-	-	-	41.00	2.05	0.00	0.00	-	-	0.81	0.03
22-05-CST	-	-	-	-	-	-	-	-	-	-	-	-	0.11	0.49	0.00	0.00	-	-	0.00	0.00
22-15-LH-BS	0.04	0.19	0.04	0.19	0.04	0.19	0.01	0.03	0.56	2.44	0.47	2.05	0.03	0.13	0.00	0.00	-	-	0.01	0.04
23-15-HT-BS	0.03	0.14	0.03	0.14	0.03	0.14	0.00	0.02	0.42	1.86	0.36	1.56	0.02	0.10	0.00	0.00	-	-	0.01	0.03
24-15-LP-RG	-	-	-	-	-	-	-	-	-	-	-	-	8.27	36.25	0.00	0.00	-	-	0.17	0.73
25-15-CST	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.09	0.00	0.00	-	-	0.00	0.00
26-17-GST	-	-	-	-	-	-	-	-	-	-	-	-	0.09	0.41	0.00	0.00	-	-	0.00	0.01
Totals	**0.51**	**2.25**	**0.51**	**2.25**	**0.51**	**2.25**	**0.08**	**0.36**	**6.72**	**29.49**	**5.65**	**24.77**	**193.37**	**490.05**	**0.00**	**0.00**	**0.00**	**0.00**	**11.23**	**41.44**

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

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

Section OPGP-B.2: Proposed Allowable Emissions

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

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

Emission Point ID	TSP[1]		PM10[1]		PM2.5[1]		SO_2		NOx		CO		VOC		TRS		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
1-05-HT-BS	0.01	0.04	0.01	0.04	0.01	0.04	0.00	0.01	0.11	0.49	0.09	0.41	0.01	0.03	0.00	0.00	-	-
2-05-HT-BS	0.01	0.04	0.01	0.04	0.01	0.04	0.00	0.01	0.11	0.49	0.09	0.41	0.01	0.03	0.00	0.00	-	-
3-05-HT-BS	0.03	0.14	0.03	0.14	0.03	0.14	0.00	0.02	0.42	1.86	0.36	1.56	0.02	0.10	0.00	0.00	-	-
4-05-FH-BS	0.17	0.74	0.17	0.74	0.17	0.74	0.03	0.12	2.23	9.77	1.87	8.21	0.12	0.54	0.00	0.00	-	-
5-05-FH-BS	0.17	0.74	0.17	0.74	0.17	0.74	0.03	0.12	2.23	9.77	1.87	8.21	0.12	0.54	0.00	0.00	-	-
6-05-LH-BS	0.04	0.19	0.04	0.19	0.04	0.19	0.01	0.03	0.56	2.44	0.47	2.05	0.03	0.13	0.00	0.00	-	-
7-05-LH-BS	0.01	0.03	0.01	0.03	0.01	0.03	0.00	0.00	0.08	0.37	0.07	0.31	0.00	0.02	0.00	0.00	-	-
8-05-SBP	-	-	-	-	-	-	-	-	-	-	-	-	0.24	0.09	0.00	0.00	-	-
9a-05-OST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.11	0.46	0.00	0.00	-	-
9b-05-OST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.11	0.46	0.00	0.00	-	-
9c-05-OST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.52	2.26	0.00	0.00	-	-
9d-05-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	1.79	7.80	0.00	0.00	-	-
9e-05-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	1.79	7.80	0.00	0.00	-	-
9f-05-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.03	0.13	0.00	0.00	-	-
10-05-IOT-V	-	-	-	-	-	-	-	-	-	-	-	-	0.32	1.45	0.00	0.00	-	-
11-05-IOT-V	-	-	-	-	-	-	-	-	-	-	-	-	0.49	2.17	0.00	0.00	-	-
12-05-OST-V	-	-	-	-	-	-	-	-	-	-	-	-	0.14	0.63	0.00	0.00	-	-
13-05-SUMP	-	-	-	-	-	-	-	-	-	-	-	-	0.24	0.09	0.00	0.00	-	-
14-05-FE	-	-	-	-	-	-	-	-	-	-	-	-	1.28	5.59	0.00	0.00	-	-
15-05-F	0.19	0.83	0.19	0.83	0.19	0.83	0.00	0.00	2.45	10.71	4.88	21.38	3.69	16.14	0.00	0.00	-	-
17-05-CB	-	-	-	-	-	-	-	-	-	-	-	-	41.00	2.05	0.00	0.00	-	-
19-05-CB	-	-	-	-	-	-	-	-	-	-	-	-	41.00	2.05	0.00	0.00	-	-
22-05-CST	-	-	-	-	-	-	-	-	-	-	-	-	0.11	0.49	0.00	0.00	-	-
22-15-LH-BS	0.04	0.19	0.04	0.19	0.04	0.19	0.01	0.03	0.56	2.44	0.47	2.05	0.03	0.13	0.00	0.00	-	-
23-15-HT-BS	0.03	0.14	0.03	0.14	0.03	0.14	0.00	0.02	0.42	1.86	0.36	1.56	0.02	0.10	0.00	0.00	-	-
24-15-LP-RG	-	-	-	-	-	-	-	-	-	-	-	-	8.27	36.25	0.00	0.00	-	-
25-15-CST	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.09	0.00	0.00	-	-
26-17-GST	-	-	-	-	-	-	-	-	-	-	-	-	0.09	0.41	0.00	0.00	-	-
Totals	**0.70**	**3.08**	**0.70**	**3.08**	**0.70**	**3.08**	**0.08**	**0.36**	**9.17**	**40.20**	**10.53**	**46.15**	**101.60**	**88.03**	**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		n-Hexane		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
1-05-HT-BS	0.00	0.01	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.01	-	-	-	-
2-05-HT-BS	0.00	0.01	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.01	-	-	-	-
3-05-HT-BS	0.01	0.03	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.01	0.03	-	-	-	-
4-05-FH-BS	0.04	0.19	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.01	0.04	0.18	-	-	-	-
5-05-FH-BS	0.04	0.19	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.01	0.04	0.18	-	-	-	-
6-05-LH-BS	0.01	0.04	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.01	0.04	-	-	-	-
7-05-LH-BS	0.00	0.01	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.01	-	-	-	-
8-05-SBP	0.10	0.02	-	-	0.03	0.01	-	-	-	-	0.04	0.01	0.00	0.00	-	-	0.01	0.00	0.01	0.00	0.01	0.00
9a-05-OST-CV	0.01	0.03	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.01	0.03	0.00	0.00	0.00	0.00
9b-05-OST-CV	0.01	0.03	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.01	0.03	0.00	0.00	0.00	0.00
9c-05-OST-CV	0.05	0.20	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.05	0.20	0.00	0.00	0.00	0.00
9d-05-WST-CV	0.41	1.83	-	-	0.09	0.38	-	-	-	-	0.13	0.58	0.00	0.02	-	-	0.11	0.49	0.04	0.19	0.04	0.17
9e-05-WST-CV	0.41	1.83	-	-	0.09	0.38	-	-	-	-	0.13	0.58	0.00	0.02	-	-	0.11	0.49	0.04	0.19	0.04	0.17
9f-05-WST-CV	0.00	0.01	-	-	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-IOT-V	0.03	0.12	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.03	0.12	0.00	0.00	0.00	0.00
11-05-IOT-V	0.04	0.19	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.04	0.19	0.00	0.00	0.00	0.00
12-05-OST-V	0.01	0.06	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.01	0.06	0.00	0.00	0.00	0.00
13-05-SUMP	0.10	0.02	-	-	0.03	0.01	-	-	-	-	0.04	0.01	0.00	0.00	-	-	0.01	0.00	0.01	0.00	0.01	0.00
14-05-FE	0.00	0.05	-	-	0.00	0.00	-	-	-	-	0.00	0.01	0.00	0.00	-	-	0.00	0.02	0.00	0.01	0.00	0.01
15-05-F	0.27	1.14	-	-	0.03	0.12	-	-	-	-	0.03	0.11	0.00	0.00	-	-	0.20	0.87	0.01	0.04	0.00	0.00
17-05-CB	0.81	0.03	-	-	0.11	0.01	-	-	-	-	0.09	0.00	0.01	0.00	-	-	0.47	0.02	0.10	0.00	0.03	0.00
19-05-CB	0.81	0.03	-	-	0.11	0.01	-	-	-	-	0.09	0.00	0.01	0.00	-	-	0.47	0.02	0.10	0.00	0.03	0.00
22-05-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
22-15-LH-BS	0.01	0.04	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.01	0.04	-	-	-	-
23-15-HT-BS	0.01	0.03	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.01	0.03	-	-	-	-
24-15-LP-RG	0.17	0.73	-	-	0.00	0.00	-	-	-	-	0.10	0.42	0.00	0.01	-	-	0.00	0.00	0.05	0.21	0.02	0.09
25-15-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
26-17-GST	0.00	0.01	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.01	0.00	0.00	0.00	0.00
Totals:	**3.35**	**6.88**	**0.00**	**0.00**	**0.49**	**0.92**	**0.00**	**0.00**	**0.00**	**0.00**	**0.65**	**1.72**	**0.02**	**0.05**	**0.00**	**0.02**	**1.65**	**3.09**	**0.36**	**0.64**	**0.18**	**0.44**

Section OPGP-B.4: Greenhouse Gas Emissions

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

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

		CO_2 (non-biogenic) ton/yr	CO_2 (biogenic)[2] ton/yr	N_2O ton/yr	CH_4 ton/yr	SF_6 ton/yr	PFC/HFC[3] ton/yr					Total GHG Mass Basis ton/yr[5]	Total CO_2e ton/yr[6]
Emission Point ID	**GWPs [1]**	**1**	**1**	**265**	**28**	**22,800**	**footnote 4**						
1-05-HT-BS	**mass GHG**	639.97	0.00	0.00	0.01	0.00	0.00					639.98	
	CO_2e	639.97	0.00	0.00	0.31	0.00	0.00						640.28
2-05-HT-BS	**mass GHG**	639.97	0.00	0.00	0.01	0.00	0.00					639.98	
	CO2e	639.97	0.00	0.00	0.31	0.00	0.00						640.28
3-05-HT-BS	**mass GHG**	2431.87	0.00	0.00	0.04	0.00	0.00					2431.92	
	CO2e	2431.87	0.00	0.00	1.23	0.00	0.00						2433.11
4-05-FH-BS	**mass GHG**	12799.35	0.00	0.02	0.22	0.00	0.00					12799.59	
	CO2e	12799.35	0.00	5.84	6.17	0.00	0.00						12811.37
5-05-FH-BS	**mass GHG**	12799.35	0.00	0.02	0.22	0.00	0.00					12799.59	
	CO2e	12799.35	0.00	5.84	6.17	0.00	0.00						12811.37
6-05-LH-BS	**mass GHG**	3199.84	0.00	0.01	0.06	0.00	0.00					3199.91	
	CO2e	3199.84	0.00	2.92	1.54	0.00	0.00						3204.31
7-05-LH-BS	**mass GHG**	479.98	0.00	0.00	0.01	0.00	0.00					479.99	
	CO2e	479.98	0.00	0.00	0.31	0.00	0.00						480.29
8-05-SBP	**mass GHG**	43.14	0.00	0.00	0.08	0.00	0.00					43.22	
	CO2e	43.14	0.00	0.00	2.16	0.00	0.00						45.30
9a-05-OST-CV	**mass GHG**	0.39	0.00	0.00	0.39	0.00	0.00					0.77	
	CO2e	0.39	0.00	0.00	10.80	0.00	0.00						11.19
9b-05-OST-CV	**mass GHG**	0.39	0.00	0.00	0.39	0.00	0.00					0.77	
	CO2e	0.39	0.00	0.00	10.80	0.00	0.00						11.19
9c-05-OST-CV	**mass GHG**	0.00	0.00	0.00	0.15	0.00	0.00					0.15	
	CO2e	0.00	0.00	0.00	4.32	0.00	0.00						4.32
9d-05-WST-CV	**mass GHG**	1725.73	0.00	0.00	3.40	0.00	0.00					1729.13	
	CO2e	1725.73	0.00	0.00	95.06	0.00	0.00						1820.80
9e-05-WST-CV	**mass GHG**	1725.73	0.00	0.00	3.40	0.00	0.00					1729.13	
	CO2e	1725.73	0.00	0.00	95.06	0.00	0.00						1820.80
9f-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	0.31	0.00	0.00						0.31
10-05-IOT-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
11-05-IOT-V	**mass GHG**	0.00	0.00	0.00	0.01	0.00	0.00					0.01	
	CO2e	0.00	0.00	0.00	0.31	0.00	0.00						0.31
12-05-OST-V	**mass GHG**	0.00	0.00	0.00	0.04	0.00	0.00					0.04	
	CO2e	0.00	0.00	0.00	1.23	0.00	0.00						1.23
13-05-SUMP	**mass GHG**	43.14	0.00	0.00	0.08	0.00	0.00					43.22	
	CO2e	43.14	0.00	0.00	2.16	0.00	0.00						45.30
14-05-FE	**mass GHG**	24.84	0.00	0.00	0.90	0.00	0.00					25.74	
	CO2e	24.84	0.00	0.00	25.31	0.00	0.00						50.14
15-05-F	**mass GHG**	9451.75	0.00	0.02	45.25	0.00	0.00					9497.03	
	CO2e	9451.75	0.00	5.84	1267.00	0.00	0.00						10724.59
17-05-CB	**mass GHG**	123.37	0.00	0.00	2.81	0.00	0.00					126.18	
	CO2e	123.37	0.00	0.00	78.71	0.00	0.00						202.08

		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-CB	**mass GHG**	123.37	0.00	0.00	2.81	0.00	0.00					126.18	
	CO2e	123.37	0.00	0.00	78.71	0.00	0.00						202.08
22-05-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
22-15-LH-BS	**mass GHG**	3199.84	0.00	0.01	0.06	0.00	0.00					3199.91	
	CO2e	3199.84	0.00	2.92	1.54	0.00	0.00						3204.31
23-15-HT-BS	**mass GHG**	2431.87	0.00	0.00	0.04	0.00	0.00					2431.92	
	CO2e	2431.87	0.00	0.00	1.23	0.00	0.00						2433.11
24-15-LP-RG	**mass GHG**	196.95	0.00	0.00	1.68	0.00	0.00					198.63	
	CO2e	196.95	0.00	0.00	46.91	0.00	0.00						243.86
25-15-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
26-17-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
FACILITY TOTAL	**mass GHG**	**52080.87**	**0.00**	**0.09**	**62.06**	**0.00**	**0.00**					**52143.01**	
	CO_2e	**52080.87**	**0.00**	**23.37**	**1737.68**	**0.00**	**0.00**						**53841.92**

[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
1-05-HT-BS	V	No	15	440±	500	0.5	37.3	0	31 18 49.60	90 32 57.90
2-05-HT-BS	V	No	15	440±	500	0.5	37.3	0	31 18 49.60	90 32 57.90
3-05-HT-BS	V	No	15	440±	500	0.5	142	0	31 18 49.60	90 32 57.90
4-05-FH-BS	V	No	15	440±	500	0.5	747	0	31 18 49.60	90 32 57.90
5-05-FH-BS	V	No	15	440±	500	0.5	747	0	31 18 49.60	90 32 57.90
6-05-LH-BS	V	No	15	440±	500	0.5	187	0	31 18 49.60	90 32 57.90
7-05-LH-BS	V	No	15	440±	500	0.5	28.0	0	31 18 49.60	90 32 57.90
8-05-SBP	V	No	5	440±	70	0.2	9.1	0	31 18 49.60	90 32 57.90
9a-05-OST-CV	V	No	24	440±	70	0.5	0.01	0	31 18 49.60	90 32 57.90
9b-05-OST-CV	V	No	24	440±	70	0.5	0.01	0	31 18 49.60	90 32 57.90
9c-05-OST-CV	V	No	25	440±	70	0.2	<0.01	0	31 18 49.60	90 32 57.90
9d-05-WST-CV	V	No	25	440±	70	0.2	41.4	0	31 18 49.60	90 32 57.90
9e-05-WST-CV	V	No	25	440±	70	0.2	41.4	0	31 18 49.60	90 32 57.90
9f-05-WST-CV	V	No	25	440±	70	0.2	0.43	0	31 18 49.60	90 32 57.90
10-05-IOT-V	V	No	18	440±	70	0.2	0.53	0	31 18 49.60	90 32 57.90
11-05-IOT-V	H	No	25	440±	70	0.2	0.71	0	31 18 49.60	90 32 57.90
12-05-OST-V	V	No	20	440±	70	0.2	0.06	0	31 18 49.60	90 32 57.90
13-05-SUMP	V	No	5	440±	70	0.2	9.1	0	31 18 49.60	90 32 57.90
15-05-F	V	No	30	440±	1500	1.0	110	0	31 18 49.60	90 32 57.90
22-05-CST	V	No	15	440±	70	0.1	<0.01	0	31 18 49.60	90 32 57.90
22-15-LH-BS	V	No	15	440±	500	0.5	187	0	31 18 49.60	90 32 57.90
23-15-HT-BS	V	No	15	440±	500	0.5	142	0	31 18 49.60	90 32 57.90
24-15-LP-RG	V	No	15	440±	70	0.5	646	0	31 18 49.60	90 32 57.90
25-15-CST	H	No	8	440±	70	0.1	<0.01	0	31 18 49.60	90 32 57.90
26-17-GST	H	No	11	440±	70	0.2	<0.01	0	31 18 49.60	90 32 57.90

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

Denbury Onshore LLC
Olive EOR Facility
Amite County, MS

Section B.6: EMISSION POINT SOURCE LIST

Facility Ref. No.:	MDEQ EPN:	Footnote:	Emission Point Description:	Routes To:	Operating Rate/Capacity	Operating Schedule:		
						Hrs/Day or (Hrs/Yr)	Days/Wk	Wks/Yr
1-05-HT-BS	AA-002		1.0 MMBTU/Hr Heater Treater-Burner Stack (V-22A)		1.0 MMBTU/Hr	24	7	52.143
2-05-HT-BS	AA-003		1.0 MMBTU/Hr Heater Treater-Burner Stack (V-22B)		1.0 MMBTU/Hr	24	7	52.143
3-05-HT-BS	AA-004		3.8 MMBTU/Hr Heater Treater-Burner Stack (V-24A)		3.8 MMBTU/Hr	24	7	52.143
4-05-FH-BS	AA-005		20 MMBTU/Hr Down Fired Heater-Burner Stack (H-106)		20 MMBTU/Hr	24	7	52.143
5-05-FH-BS	AA-006		20 MMBTU/Hr Down Fired Heater-Burner Stack (H-108)		20 MMBTU/Hr	24	7	52.143
6-05-LH-BS	AA-007		5.0 MMBTU/Hr Line Heater-Burner Stack (H-101)		5.0 MMBTU/Hr	24	7	52.143
7-05-LH-BS	AA-008		750 MBTU/Hr Line Heater-Burner Stack (E-129)		750 MBTU/Hr	24	7	52.143
8-05-SBP	AA-009		Sand Blowdown Pit (SP-130)		36,500 BWPY	(730)	-	-
9a-05-OST-CV	AA-010	a	5000 BBL Wet Oil Storage Tank-Common Vent (T-1)	15-05-F	1,095,000 BOPY	24	7	52.143
9b-05-OST-CV	AA-011	a	5000 BBL Dry Oil Storage Tank-Common Vent (T-2)	15-05-F	1,095,000 BOPY	24	7	52.143
9c-05-OST-CV	AA-012		1000 BBL Bad Oil Storage Tank-Common Vent (T-3)		2,920 BOPY	24	7	52.143
9d-05-WST-CV	AA-013		1500 BBL Produced Water Skimmer Tank-Common Vent (T-4)		1,460,000 BWPY & 1,460 BOPY	24	7	52.143
9e-05-WST-CV	AA-014		1500 BBL Produced Water Skimmer Tank-Common Vent (T-4B)		1,460,000 BWPY & 1,460 BOPY	24	7	52.143
9f-05-WST-CV	AA-015		3000 BBL Produced Water Storage Tank-Common Vent (T-7)		126,000 Gallons	24	7	52.143
10-05-IOT-V	AA-016		1000 BBL Inhibitor Oil Tank-Vent (T-133A)		4,000 BWPY	24	7	52.143
11-05-IOT-V	AA-017		1500 BBL Inhibitor Oil Tank-Vent (T-133B)		6,000 BWPY	24	7	52.143
12-05-OST-V	AA-018		400 BBL Sand Blowdown Pit Tank-Vent (T-150)		16,800 Gallons	24	7	52.143
13-05-SUMP	AA-019		Process Sump (P-106)		36,500 BWPY	24	7	52.143
14-05-FE	AA-020		Fugitive Emissions		N/A	24	7	52.143
15-05-F	AA-021	b	Control Flare		201 MMSCF/Yr	24	7	52.143
16-05-VS	AA-022	c	Vent Scrubber (V-135)		N/A	24	7	52.143
17-05-CB	AA-023		High Pressure Compressor Blowdowns		2.3 MMSCF/Yr	(100)	-	-
19-05-CB	AA-025		Low Pressure Compressor Blowdowns		2.3 MMSCF/Yr	(100)	-	-
22-05-CST	AA-029		215 BBL Corrosion Inhibitor Tank (T-134)		21,000 Gallons/Yr	24	7	52.143
22-15-LH-BS	AA-031		5.0 MMBTU/Hr Line Heater-Burner Stack (H-103)		5.0 MMBTU/Hr	24	7	52.143
23-15-HT-BS	AA-032		3.8 MMBTU/Hr Heater Treater-Burner Stack (V-24B)		3.8 MMBTU/Hr	24	7	52.143
24-15-LP-RG	AA-001	d	Low Pressure Relief Gas (AA-001)		4.0 MMSCF/Yr	(d)	-	-

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
25-15-CST	AA-034		750 Gallon Paraffin Inhibitor Tank		10,000 Gallons/Yr	24	7	52.143
26-17-GST	AA-033		790 Gallon Gasoline Storage Tank		7,900 Gallons/Yr	24	7	52.143

Footnotes:

a *Vapors from this source are routed to the control flare (15-05-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 *Emergency use only.*

d *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-002 & AA-003 [1-05-HT-BS (V-22A) & 2-05-HT-BS (V-22B)]

B. Equipment Description: 1.0 MMBTU/Hr Heater Treater-Burner Stack

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

E. Maximum Heat Input (higher heating value): 1.0 MMBtu/hr F. Nominal Heat Input Capacity: 1.0 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	1121 BTU/ft^3	<0.0007	N/A	1,115.08 scf	9.8 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-004 & AA-032 [3-05-HT-BS (V-24A) & 23-15-HT-BS (V-24B)]

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	1121 BTU/ft^3	<0.0007	N/A	4,237.29 scf	37.1 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-005 & AA-006 [4-05-FH-BS (H-106) & 5-05-FH-BS (H-108)]

B. Equipment Description: 20 MMBTU/Hr Down Fired Heater-Burner Stack

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

E. Maximum Heat Input (higher heating value): 20 MMBtu/hr F. Nominal Heat Input Capacity: 20 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	1121 BTU/ft^3	<0.0007	N/A	22,301.52 scf	195 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-007 & AA-031 [6-05-LH-BS (H-101) & 22-15-LH-BS (H-103)]

B. Equipment Description: 5.0 MMBTU/Hr Line Heater-Burner Stack

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

E. Maximum Heat Input (higher heating value): 5.0 MMBtu/hr F. Nominal Heat Input Capacity: 5.0 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	1121 BTU/ft^3	<0.0007	N/A	5,575.38 scf	48.8 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-008 [7-05-LH-BS (E-129)]

B. Equipment Description: 750 MBTU/Hr Line Heater-Burner Stack

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

E. Maximum Heat Input (higher heating value): .750 MMBtu/hr F. Nominal Heat Input Capacity: 0.750 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	1121 BTU/ft^3	<0.0007	N/A	836.31 scf	7.33 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-010 & AA-011 [9a-05-OST-CV (T-1) & 9b-05-OST-CV (T-2)]

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: 1982

2. Tank Data

A. Tank Specifications:

1.	Design capacity	210,000	gallons		
2.	True vapor pressure at storage temperature:	5.663	psia @	74.30	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	6.548	psia @	82.84	ºF
4.	Reid vapor pressure at storage temperature:	6.80	psia @	74.30	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: 227.41
7. Maximum throughput: 1,095,000 BBLs/yr
8. Is the tank heated? ☐ Yes ☒ No

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

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

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

Tank Summary | Section OPGP-E

5. Internal Floating Roof Tank

A. Tank Characteristics:

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

B. Rim Seal System:

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

C. Deck Characteristics:

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

6. External Floating Roof Tank

A. Tank Characteristics

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

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

Tank Summary | Section OPGP-E

6. External Floating Roof Tank (continued)

A. Tank Characteristics (continued):

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

7. Paint Condition: ☐ Good ☐ Poor

B. Roof Characteristics

1. Roof Type: ☐ Pontoon ☐ Double Deck

2. Roof Fitting Category: ☐ Typical ☐ Detail

C. Tank Construction and Rim-Seal System:

1. Tank Construction: ☐ Welded ☐ Riveted

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

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

7. Pollutant Emissions

A. Fixed Roof Emissions:

Pollutant[1]	Working Loss (tons/yr)	Breathing Loss (tons/yr)	Total Emissions (tons/yr)
VOC	113.22*	6.97*	120.19*

**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-012 [9c-05-OST-CV (T-3)]

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: 1982

2. Tank Data

A. Tank Specifications:

1.	Design capacity	42,000	gallons		
2.	True vapor pressure at storage temperature:	5.649	psia @	74.16	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	6.532	psia @	82.69	ºF
4.	Reid vapor pressure at storage temperature:	6.80	psia @	74.16	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: 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: 2.99
7. Maximum throughput: 2,920 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	0.30	1.96	2.26

B. Floating Roof Emissions:

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

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

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

Tank Summary | Section OPGP-E

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-013 & AA-014 [9d-05-WST-CV (T-4) & 9e-05-WST-CV (T-4B)]

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:	0.419	psia @	73.84	°F
3.	Maximum true vapor pressure (as defined in §60.111b)	0.554	psia @	82.37	°F
4.	Reid vapor pressure at storage temperature:	0.419	psia @	73.84	°F
5.	Density of product at storage temperature:	N/A	lb/gal		
6.	Molecular weight of product vapor at storage temp.	18.44	lb/lbmol		

B. Tank Orientation: ☒ Vertical ☐ Horizontal

C. Type of Tank:

☒ Fixed Roof ☐ External Floating Roof ☐ Internal Floating Roof

☐ Pressure ☐ Variable Vapor Space ☐ Other: _____

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

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

E. Closest City:

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

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

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

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

Tank Summary | Section OPGP-E

3. Horizontal Fixed Roof Tank

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

4. Vertical Fixed Roof Tank

A. Dimensions:
1. Shell Height: 24 feet
2. Shell Diameter: 21.6 feet
3. Maximum Liquid Height: 23 feet
4. Average Liquid Height: 11.5 feet
5. Working Volume: 63,000 gal
6. Turnovers per year: 973.5
7. Maximum throughput: 1,461,460 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: 0.68 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	4.13	0.07	4.20

B. Floating Roof Emissions:

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

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

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

Tank Summary | Section OPGP-E

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-015 [9f-05-WST-CV (T-7)]

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:	0.417	psia @	74.09	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	0.552	psia @	82.62	ºF
4.	Reid vapor pressure at storage temperature:	0.417	psia @	74.09	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: 24.13 feet
2. Shell Diameter: 29.72 feet
3. Maximum Liquid Height: 23.13 feet
4. Average Liquid Height: 11.57 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	0.13	0.13

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-016 [10-05-IOT-V (T-133A)]

B. Product(s) Stored: Produced Water & Corrosion Inhibitor

C. Status: ☒ Operating ☐ Proposed ☐ Under Construction

D. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction: 1989

2. Tank Data

A. Tank Specifications:

1.	Design capacity	42,000	gallons		
2.	True vapor pressure at storage temperature:	0.418	psia @	74.16	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	0.554	psia @	82.69	ºF
4.	Reid vapor pressure at storage temperature:	0.418	psia @	74.16	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: 16.1 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: 4.1
7. Maximum throughput: 4,000 BBLs/yr
8. Is the tank heated? ☐ Yes ☒ No

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

C. Roof Characteristics:
1. Roof Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☒ Gray/Medium ☐ Red/Primer
2. Roof Condition: ☒ Good ☐ Poor
3. Type: ☒ Cone ☐ Dome
4. Height: 0.67 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	0.01	0.05	0.06

B. Floating Roof Emissions:

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

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

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

Tank Summary | Section OPGP-E

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-017 [11-05-IOT-V (T-133B)]

B. Product(s) Stored: Produced Water & Corrosion Inhibitor

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:	0.413	psia @	73.83	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	0.548	psia @	82.37	ºF
4.	Reid vapor pressure at storage temperature:	0.413	psia @	73.83	ºF
5.	Density of product at storage temperature:	N/A	lb/gal		
6.	Molecular weight of product vapor at storage temp.	18.02	lb/lbmol		

B. Tank Orientation: ☒ Vertical ☐ Horizontal

C. Type of Tank:

☒ Fixed Roof ☐ External Floating Roof ☐ Internal Floating Roof

☐ Pressure ☐ Variable Vapor Space ☐ Other: _____

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

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

E. Closest City:

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

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

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

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

Tank Summary | Section OPGP-E

3. Horizontal Fixed Roof Tank

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

4. Vertical Fixed Roof Tank

A. Dimensions:
1. Shell Height: 24 feet
2. Shell Diameter: 21.5 feet
3. Maximum Liquid Height: 23 feet
4. Average Liquid Height: 11.5 feet
5. Working Volume: 63,000 gal
6. Turnovers per year: 4.03
7. Maximum throughput: 6,000 BBLs/yr
8. Is the tank heated? ☐ Yes ☒ No

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

C. Roof Characteristics:
1. Roof Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☒ Gray/Medium ☐ Red/Primer
2. Roof Condition: ☒ Good ☐ Poor
3. Type: ☒ Cone ☐ Dome
4. Height: 0.67 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	0.02	0.07	0.09

B. Floating Roof Emissions:

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

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

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

Tank Summary | Section OPGP-E

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-018 [12-05-OST-V (T-150)]

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	16,800	gallons		
2.	True vapor pressure at storage temperature:	5.588	psia @	73.52	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	6.464	psia @	82.06	ºF
4.	Reid vapor pressure at storage temperature:	6.80	psia @	73.52	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: 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	0.63	0.63

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-029 [22-05-CST (T-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: 2005

2. Tank Data

A. Tank Specifications:

1.	Design capacity	9,030	gallons		
2.	True vapor pressure at storage temperature:	2.799	psia @	75.15	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	3.540	psia @	85.04	ºF
4.	Reid vapor pressure at storage temperature:	2.799	psia @	75.15	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: _____ 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: 10.2 feet
3. Maximum Liquid Height: 14 feet
4. Average Liquid Height: 7 feet
5. Working Volume: 9,030 gal
6. Turnovers per year: 2.45
7. Maximum throughput: 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: 0.32 feet

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

Tank Summary | Section OPGP-E

5. Internal Floating Roof Tank

A. Tank Characteristics:

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

B. Rim Seal System:

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

C. Deck Characteristics:

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

6. External Floating Roof Tank

A. Tank Characteristics

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

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

Tank Summary | Section OPGP-E

6. External Floating Roof Tank (continued)

A. Tank Characteristics (continued):

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

7. Paint Condition: ☐ Good ☐ Poor

B. Roof Characteristics

1. Roof Type: ☐ Pontoon ☐ Double Deck

2. Roof Fitting Category: ☐ Typical ☐ Detail

C. Tank Construction and Rim-Seal System:

1. Tank Construction: ☐ Welded ☐ Riveted

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

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

7. Pollutant Emissions

A. Fixed Roof Emissions:

Pollutant[1]	Working Loss (tons/yr)	Breathing Loss (tons/yr)	Total Emissions (tons/yr)
VOC	0.06	0.43	0.49

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-034 [25-15-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: 2015

2. Tank Data

A. Tank Specifications:

1.	Design capacity	750	gallons		
2.	True vapor pressure at storage temperature:	2.779	psia @	74.87	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	3.517	psia @	84.76	ºF
4.	Reid vapor pressure at storage temperature:	2.779	psia @	74.87	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 feet
C. Working Volume: 750 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	0.06	0.09

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-033 [26-17-GST]

B. Product(s) Stored: Gasoline

C. Status: ☒ Operating ☐ Proposed ☐ Under Construction

D. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction: 2017

2. Tank Data

A. Tank Specifications:

1.	Design capacity	790	gallons		
2.	True vapor pressure at storage temperature:	9.046	psia @	74.51	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	10.739	psia @	84.40	ºF
4.	Reid vapor pressure at storage temperature:	9.046	psia @	74.51	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: 11 feet
B. Shell Diameter: 3.5 feet
C. Working Volume: 790 gal
D. Maximum Throughput: 7,900 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	0.36	0.41

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-021 (15-05-F)

B. Equipment Description (include the process(es) that the flare controls emissions from):
Control flare to combust emissions from oil storage tanks (EPNs: 9a-05-OST-CV & 9b-05-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: 1051 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
1-05-HT-BS *Heater Treater* 2-05-HT-BS *Heater Treater* 3-05-HT-BS *Heater Treater* 4-05-FH-BS *Down Fired Heater* 5-05-FH-BS *Down Fired Heater* 6-05-LH-BS *Line Heater* 7-05-LH-BS *Line Heater* 22-15-LH-BS *Line Heater* 23-15-HT-BS *Heater Treater*	11 Miss. Admin. Code Pt. 2, R. 1.3.A.	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.

1-05-HT-BS *Heater Treater* 2-05-HT-BS *Heater Treater* 3-05-HT-BS *Heater Treater* 4-05-FH-BS *Down Fired Heater* 5-05-FH-BS *Down Fired Heater* 6-05-LH-BS *Line Heater* 7-05-LH-BS *Line Heater* 22-15-LH-BS *Line Heater* 23-15-HT-BS *Heater Treater*	11 Miss Admin Code Pt. 2, R. 1.3 B.	2005	2005	N/A
1-05-HT-BS *Heater Treater* 2-05-HT-BS *Heater Treater* 3-05-HT-BS *Heater Treater* 4-05-FH-BS *Down Fired Heater* 5-05-FH-BS *Down Fired Heater* 6-05-LH-BS *Line Heater* 7-05-LH-BS *Line Heater* 22-15-LH-BS *Line Heater* 23-15-HT-BS *Heater Treater*	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.

1-05-HT-BS *Heater Treater* 2-05-HT-BS *Heater Treater* 3-05-HT-BS *Heater Treater* 4-05-FH-BS *Down Fired Heater* 5-05-FH-BS *Down Fired Heater* 6-05-LH-BS *Line Heater* 7-05-LH-BS *Line Heater* 22-15-LH-BS *Line Heater* 23-15-HT-BS *Heater Treater*	11 Miss. Admin. Code Pt. 2, R. 1.3. D(1)(a).	2005	2005	N/A
1-05-HT-BS *Heater Treater* 2-05-HT-BS *Heater Treater* 3-05-HT-BS *Heater Treater* 4-05-FH-BS *Down Fired Heater* 5-05-FH-BS *Down Fired Heater* 6-05-LH-BS *Line Heater* 7-05-LH-BS *Line Heater* 22-15-LH-BS *Line Heater* 23-15-HT-BS *Heater Treater*	11 Miss. Admin. Code Pt. 2, R.1.4.A(1).	2005	2005	N/A
15-05-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
1-05-HT-BS *Heater Treater* 2-05-HT-BS *Heater Treater* 3-05-HT-BS *Heater Treater* 4-05-FH-BS *Down Fired Heater* 5-05-FH-BS *Down Fired Heater* 6-05-LH-BS *Line Heater* 7-05-LH-BS *Line Heater* 22-15-LH-BS *Line Heater* 23-15-HT-BS *Heater Treater*	11 Miss. Admin. Code Pt. 2, R. 1.3.A.	Opacity	40%	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.

1-05-HT-BS *Heater Treater* 2-05-HT-BS *Heater Treater* 3-05-HT-BS *Heater Treater* 4-05-FH-BS *Down Fired Heater* 5-05-FH-BS *Down Fired Heater* 6-05-LH-BS *Line Heater* 7-05-LH-BS *Line Heater* 22-15-LH-BS *Line Heater* 23-15-HT-BS *Heater Treater*	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.

1-05-HT-BS *Heater Treater* 2-05-HT-BS *Heater Treater* 3-05-HT-BS *Heater Treater* 4-05-FH-BS *Down Fired Heater* 5-05-FH-BS *Down Fired Heater* 6-05-LH-BS *Line Heater* 7-05-LH-BS *Line Heater* 22-15-LH-BS *Line Heater* 23-15-HT-BS *Heater Treater*	11 Miss. Admin. Code Pt. 2, R. 1.3. D(1)(b).	PM	$E = 0.8808*I^{-0.1667}$	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.

1-05-HT-BS *Heater Treater* 2-05-HT-BS *Heater Treater* 3-05-HT-BS *Heater Treater* 4-05-FH-BS *Down Fired Heater* 5-05-FH-BS *Down Fired Heater* 6-05-LH-BS *Line Heater* 7-05-LH-BS *Line Heater* 22-15-LH-BS *Line Heater* 23-15-HT-BS *Heater Treater*	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.

1-05-HT-BS *Heater Treater* 2-05-HT-BS *Heater Treater* 3-05-HT-BS *Heater Treater* 4-05-FH-BS *Down Fired Heater* 5-05-FH-BS *Down Fired Heater* 6-05-LH-BS *Line Heater* 7-05-LH-BS *Line Heater* 22-15-LH-BS *Line Heater* 23-15-HT-BS *Heater Treater*	11 Miss. Admin. Code Pt. 2, R.1.4.A(1).	SO_2	4.8 lbs/MMBTU	N/A
15-05-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.

15-05-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.

15-05-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

POINT SOURCE I.D. NUMBER: ***1-05-HT-BS***

EMISSION SOURCE DESCRIPTION: ***1.0 MMBTU/Hr Heater Treater-Burner Stack (V-22A)***

DATA:

Emission Source:	***External Combustion Burner***
Hours of Operation:	***8760***
Maximum Burner Rating (MMBTU/Hr):	***1.0***
Fuel Gas Heat of Combustion (BTU/scf): *(based on an actual fuel gas analysis)*	***1121***
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 = ***1,115.08***

Max. Annual Fuel Consumption (MSCF/Yr): = hourly fuel consumption x hours = ***9,768.10***

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	0.0085	0.0371
Sulfur Dioxide	1.182	0.0013	0.0058
Nitrogen Oxides	100	0.1115	0.4884
Carbon Monoxide	84	0.0937	0.4103
Methane (excluded from VOC total)	2.3	0.0026	0.0112
VOC	5.5	0.0061	0.0269
TOC	11	0.0123	0.0537
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
Benzo(g,h,I)perylene (TAP)	0.0000012	0.0000	0.0000

POLLUTANT:	EMISSION FACTOR ($LBS/10^6$ SCF)	CALCULATED EMISSION RATES:	
		Hourly (lb/hr)	Annual (TPY)
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	0.0001	0.0004
Hexane (TAP)	1.8000000	0.0020	0.0088
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		**0.01**	**0.03**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***2-05-HT-BS***

EMISSION SOURCE DESCRIPTION: ***1.0 MMBTU/Hr Heater Treater-Burner Stack (V-22B)***

DATA:

Emission Source:	***External Combustion Burner***
Hours of Operation:	***8760***
Maximum Burner Rating (MMBTU/Hr):	***1.0***
Fuel Gas Heat of Combustion (BTU/scf): *(based on an actual fuel gas analysis)*	***1121***
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 = ***1,115.08***

Max. Annual Fuel Consumption (MSCF/Yr): = hourly fuel consumption x hours = ***9,768.10***

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	0.0085	0.0371
Sulfur Dioxide	1.182	0.0013	0.0058
Nitrogen Oxides	100	0.1115	0.4884
Carbon Monoxide	84	0.0937	0.4103
Methane (excluded from VOC total)	2.3	0.0026	0.0112
VOC	5.5	0.0061	0.0269
TOC	11	0.0123	0.0537
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
Benzo(g,h,I)perylene (TAP)	0.0000012	0.0000	0.0000

POLLUTANT:	EMISSION FACTOR ($LBS/10^6$ SCF)	CALCULATED EMISSION RATES:	
		Hourly (lb/hr)	Annual (TPY)
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	0.0001	0.0004
Hexane (TAP)	1.8000000	0.0020	0.0088
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		**0.01**	**0.03**

Emission Calculations

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

EMISSION SOURCE DESCRIPTION: ***3.8 MMBTU/Hr Heater Treater-Burner Stack (V-24A)***

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)*	***1121***
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 = ***4,237.29***

Max. Annual Fuel Consumption (MSCF/Yr): = hourly fuel consumption x hours = ***37,118.66***

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	0.0322	0.1411
Sulfur Dioxide	1.182	0.0050	0.0219
Nitrogen Oxides	100	0.4237	1.8559
Carbon Monoxide	84	0.3559	1.5590
Methane (excluded from VOC total)	2.3	0.0097	0.0427
VOC	5.5	0.0233	0.1021
TOC	11	0.0466	0.2042
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
Benzo(g,h,I)perylene (TAP)	0.0000012	0.0000	0.0000

POLLUTANT:	EMISSION FACTOR ($LBS/10^6$ SCF)	CALCULATED EMISSION RATES:	
		Hourly (lb/hr)	Annual (TPY)
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	0.0076	0.0334
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	0.03
Total Non VOC & Non TAP-HC		0.01	0.04
Total VOC		**0.02**	**0.10**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***4-05-FH-BS***

EMISSION SOURCE DESCRIPTION: ***20 MMBTU/Hr Down Fired Heater-Burner Stack (H-106)***

DATA:

Emission Source:	***External Combustion Burner***
Hours of Operation:	***8760***
Maximum Burner Rating (MMBTU/Hr):	***20***
Fuel Gas Heat of Combustion (BTU/scf): *(based on an actual fuel gas analysis)*	***1121***
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 = ***22,301.52***

Max. Annual Fuel Consumption (MSCF/Yr): = hourly fuel consumption x hours = ***195,361.32***

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	0.1695	0.7424
Sulfur Dioxide	1.182	0.0264	0.1154
Nitrogen Oxides	100	2.2302	9.7681
Carbon Monoxide	84	1.8733	8.2052
Methane (excluded from VOC total)	2.3	0.0513	0.2247
VOC	5.5	0.1227	0.5372
TOC	11	0.2453	1.0745
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	0.0002
Benzo(a)pyrene (TAP)	0.0000012	0.0000	0.0000
Benzo(b)fluoranthene (TAP)	0.0000018	0.0000	0.0000
Benzo(g,h,I)perylene (TAP)	0.0000012	0.0000	0.0000

POLLUTANT:	EMISSION FACTOR ($LBS/10^6$ SCF)	CALCULATED EMISSION RATES:	
		Hourly (lb/hr)	Annual (TPY)
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	0.0017	0.0073
Hexane (TAP)	1.8000000	0.0401	0.1758
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	0.0003
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	0.0002
Selenium (TAP)	0.0000240	0.0000	0.0000
Total TAPs		0.04	0.18
Total VOC-TAPs		0.04	0.18
Total Non VOC & Non TAP-HC		0.05	0.22
Total VOC		**0.12**	**0.54**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***5-05-FH-BS***

EMISSION SOURCE DESCRIPTION: ***20 MMBTU/Hr Down Fired Heater-Burner Stack (H-108)***

DATA:

Emission Source:	***External Combustion Burner***
Hours of Operation:	***8760***
Maximum Burner Rating (MMBTU/Hr):	***20***
Fuel Gas Heat of Combustion (BTU/scf): *(based on an actual fuel gas analysis)*	***1121***
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 = ***22,301.52***

Max. Annual Fuel Consumption (MSCF/Yr): = hourly fuel consumption x hours = ***195,361.32***

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	0.1695	0.7424
Sulfur Dioxide	1.182	0.0264	0.1154
Nitrogen Oxides	100	2.2302	9.7681
Carbon Monoxide	84	1.8733	8.2052
Methane (excluded from VOC total)	2.3	0.0513	0.2247
VOC	5.5	0.1227	0.5372
TOC	11	0.2453	1.0745
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	0.0002
Benzo(a)pyrene (TAP)	0.0000012	0.0000	0.0000
Benzo(b)fluoranthene (TAP)	0.0000018	0.0000	0.0000
Benzo(g,h,I)perylene (TAP)	0.0000012	0.0000	0.0000

POLLUTANT:	EMISSION FACTOR ($LBS/10^6$ SCF)	CALCULATED EMISSION RATES:	
		Hourly (lb/hr)	Annual (TPY)
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	0.0017	0.0073
Hexane (TAP)	1.8000000	0.0401	0.1758
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	0.0003
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	0.0002
Selenium (TAP)	0.0000240	0.0000	0.0000
Total TAPs		0.04	0.18
Total VOC-TAPs		0.04	0.18
Total Non VOC & Non TAP-HC		0.05	0.22
Total VOC		**0.12**	**0.54**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***6-05-LH-BS***

EMISSION SOURCE DESCRIPTION: ***5.0 MMBTU/Hr Line Heater-Burner Stack (H-101)***

DATA:

Emission Source:	***External Combustion Burner***
Hours of Operation:	***8760***
Maximum Burner Rating (MMBTU/Hr):	***5.0***
Fuel Gas Heat of Combustion (BTU/scf): *(based on an actual fuel gas analysis)*	***1121***
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 = ***5,575.38***

Max. Annual Fuel Consumption (MSCF/Yr): = hourly fuel consumption x hours = ***48,840.33***

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	0.0424	0.1856
Sulfur Dioxide	1.182	0.0066	0.0289
Nitrogen Oxides	100	0.5575	2.4420
Carbon Monoxide	84	0.4683	2.0513
Methane (excluded from VOC total)	2.3	0.0128	0.0562
VOC	5.5	0.0307	0.1343
TOC	11	0.0613	0.2686
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
Benzo(g,h,I)perylene (TAP)	0.0000012	0.0000	0.0000

POLLUTANT:	EMISSION FACTOR ($LBS/10^6$ SCF)	CALCULATED EMISSION RATES:	
		Hourly (lb/hr)	Annual (TPY)
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	0.0018
Hexane (TAP)	1.8000000	0.0100	0.0440
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	0.0001
Selenium (TAP)	0.0000240	0.0000	0.0000
Total TAPs		0.01	0.05
Total VOC-TAPs		0.01	0.05
Total Non VOC & Non TAP-HC		0.01	0.06
Total VOC		**0.03**	**0.13**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***7-05-LH-BS***

EMISSION SOURCE DESCRIPTION: ***750 MBTU/Hr Line Heater-Burner Stack (E-129)***

DATA:

Emission Source:	***External Combustion Burner***
Hours of Operation:	***8760***
Maximum Burner Rating (MMBTU/Hr):	***0.750***
Fuel Gas Heat of Combustion (BTU/scf): *(based on an actual fuel gas analysis)*	***1121***
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 = ***836.31***

Max. Annual Fuel Consumption (MSCF/Yr): = hourly fuel consumption x hours = ***7,326.08***

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	0.0064	0.0278
Sulfur Dioxide	1.182	0.0010	0.0043
Nitrogen Oxides	100	0.0836	0.3663
Carbon Monoxide	84	0.0703	0.3077
Methane (excluded from VOC total)	2.3	0.0019	0.0084
VOC	5.5	0.0046	0.0201
TOC	11	0.0092	0.0403
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
Benzo(g,h,I)perylene (TAP)	0.0000012	0.0000	0.0000

POLLUTANT:	EMISSION FACTOR ($LBS/10^6$ SCF)	CALCULATED EMISSION RATES:	
		Hourly (lb/hr)	Annual (TPY)
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	0.0001	0.0003
Hexane (TAP)	1.8000000	0.0015	0.0066
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**	**0.02**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***8-05-SBP***

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

DATA:

Emission Source:	***Flash Gas from Brine Solution****
Max. Pressure Drop of Brine Solution: (psig)	***850***
Approx. Temperature of Brine Solution: (^{o}F)	***80***
Flash Gas Specific Gravity: ***(based on an actual brine flash analysis)***	***1.5234***
Avg. Brine Throughput: (BBL/Hr)	***50***
Max. Brine Throughput: (BBL/Hr)	***50***
Blowdown Hours:	***730***
Gas to Water Ratio: (SCF/BBL of Brine; GWR)	***20.4***
Basis of Emission Estimates:	***API Documentation & Actual Brine Flash Analysis***

**Associated with vessel blowdowns*

Avg. Hourly Uncontrolled Flash Rate (SCF/Hr)	=	Brine Rate * GWR	=	**1020.00**
Avg. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Flash Gas Gravity * Density of Air * Flash Rate	=	**118.72**
Max. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Hourly * Ratio of Max. Water Rate to Avg. Water Rate	=	**118.72**
Annual Potential Uncontrolled Flash Emissions (TPY)	=	Hourly * Blowdown Hours/2000	=	**43.33**

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.: 13110657-001A 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)	0.032	0.0380	0.0380	0.0139
Carbon Dioxide (excluded from VOC total)	99.560	118.1932	118.1932	43.1421
Methane (excluded from VOC total)	0.173	0.2054	0.2054	0.0750
Ethane (excluded from VOC total)	0.034	0.0404	0.0404	0.0147
Hydrogen Sulfide (excluded from VOC total)	0.000	0.0000	0.0000	0.0000
Propane	0.030	0.0356	0.0356	0.0130
Iso-Butane	0.007	0.0083	0.0083	0.0030
N-Butane	0.018	0.0214	0.0214	0.0078
Iso-Pentane	0.000	0.0000	0.0000	0.0000
N-Pentane	0.000	0.0000	0.0000	0.0000
Iso-Hexane	0.010	0.0119	0.0119	0.0043

N-Hexane (TAP)	0.006	0.0071	0.0071	0.0026
Methylcyclopentane	0.000	0.0000	0.0000	0.0000
Benzene (TAP)	0.033	0.0392	0.0392	0.0143
Cyclohexane	0.005	0.0059	0.0059	0.0022
Heptanes	0.020	0.0237	0.0237	0.0087
Methylcyclohexane	0.000	0.0000	0.0000	0.0000
Toluene (TAP)	0.011	0.0131	0.0131	0.0048
2,2,4-Trimethylpentane (TAP)	0.022	0.0261	0.0261	0.0095
Octanes	0.005	0.0059	0.0059	0.0022
Ethylbenzene (TAP)	0.001	0.0012	0.0012	0.0004
Xylenes (TAP)	0.010	0.0119	0.0119	0.0043
Nonanes	0.009	0.0107	0.0107	0.0039
Decanes Plus	0.014	0.0166	0.0166	0.0061
Total Weight Percent:	100.000			
Total TAP Emissions		0.10	0.10	0.04
Total VOC Emissions		**0.24**	**0.24**	**0.09**
Total Non VOC & Non TAP-HC		0.25	0.25	0.09
Total Emissions		118.72	118.72	43.33

VOC Emission Total (TPY)	=	Brine Flash Gas	=	**0.09**

Emission Calculations

Emission calculations shown below are presented for informational purposes only as vapors from the oil storage tank are routed to the control flare (EPN: 15-05-F) for combustion, except during brief intervals when thief hatches are opened for purposes of sampling, gauging, etc.

POINT SOURCE I.D. NUMBER: ***9a-05-OST-CV***

EMISSION SOURCE DESCRIPTION: ***5000 BBL Wet Oil Storage Tank-Common Vent (T-1)***

DATA:

Emission Source:	***Crude Oil Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD - Q_{avg})**	***3,000***
Maximum Daily Oil Throughput: **(BBLD - Q_{max})**	***6,000***
Average VOC Working Losses - L_W (lb/yr):	***226,411.217***
Average VOC Standing Losses - L_S (lb/yr):	***13,913.712***
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	=	**31.11**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**60.42**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**136.26**

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	1.9289	3.7460	8.4484
Ethane (excluded from VOC total)	5.60	1.7422	3.3835	7.6308
Propane	17.60	5.4755	10.6339	23.9825
Iso-Butane	1.50	0.4667	0.9063	2.0440
N-Butane	27.10	8.4310	16.3738	36.9276
Iso-Pentane	1.50	0.4667	0.9063	2.0440
N-Pentane	14.60	4.5421	8.8213	19.8946
Heptane	9.20	2.8622	5.5586	12.5363
Octane	6.90	2.1466	4.1690	9.4022
Other NM/NE Hydrocarbons	1.80	0.5600	1.0876	2.4528

N-Hexane (TAP)	7.90	2.4577	4.7732	10.7649
Benzene (TAP)	0.10	0.0311	0.0604	0.1363
Total TAP Emissions		2.49	4.83	10.90
Total VOC Emissions		**27.44**	**53.29**	**120.19**
Total Non VOC & Non TAP-HC		3.67	7.13	16.08
Total Hydrocarbon Emissions		31.11	60.42	136.26

DATA:

Emission Source:	***Flash Gas from Oil***
Flash Gas Specific Gravity:	***1.079***
Average Oil Throughput: (BBLD)	***3,000***
Maximum Oil Throughput: (BBLD)	***6,000***
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 site under similar conditions (pressure & temperature), refer to Southern Petroleum Laboratories Report No.: 23120294-001A 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:			
44.08	43	75	
	0	60	5.75
		Prorated GOR Estimate:	**5.75**

Avg. Hourly Uncontrolled Flash Rate (SCF/Hr)	=	Oil Rate * GOR	=	**718.75**
Avg. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Flash Gas Gravity * Density of Air * Flash Rate	=	**59.25**
Max. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Avg. Emissions * Ratio of Max. Oil Rate to Avg. Oil Rate	=	**118.50**
Annual Potential Uncontrolled Flash Emissions (TPY)	=	Hourly * 8760/2000	=	**259.52**

SPECIATION FACTORS:

Speciation of the flash gas mixture taken from the referenced laboratory results; refer to Southern Petroleum Laboratories Report No.: 23120294-001A 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)	2.380	1.4102	2.8203	6.1765
Carbon Dioxide (excluded from VOC total)	31.760	18.8180	37.6360	82.4220
Methane (excluded from VOC total)	28.448	16.8556	33.7112	73.8268
Ethane (excluded from VOC total)	2.981	1.7663	3.5325	7.7361
Hydrogen Sulfide (excluded from VOC total)	0.000	0.0000	0.0000	0.0000

Propane	5.927	3.5118	7.0236	15.3815
Iso-Butane	3.327	1.9713	3.9425	8.6341
N-Butane	6.625	3.9254	7.8507	17.1929
Iso-Pentane	4.483	2.6562	5.3124	11.6341
N-Pentane	4.763	2.8221	5.6442	12.3607
Iso-Hexane	2.387	1.4143	2.8286	6.1946
N-Hexane (TAP)	2.487	1.4736	2.9471	6.4541
Methylcyclopentane	0.999	0.5919	1.1838	2.5926
Benzene (TAP)	0.068	0.0403	0.0806	0.1765
Cyclohexane	0.574	0.3401	0.6802	1.4896
Heptanes	1.503	0.8905	1.7811	3.9005
Methylcyclohexane	0.325	0.1926	0.3851	0.8434
Toluene (TAP)	0.042	0.0249	0.0498	0.1090
2,2,4-Trimethylpentane (TAP)	0.000	0.0000	0.0000	0.0000
Octanes	0.662	0.3922	0.7845	1.7180
Ethylbenzene (TAP)	0.007	0.0041	0.0083	0.0182
Xylenes (TAP)	0.027	0.0160	0.0320	0.0701
Nonanes	0.165	0.0978	0.1955	0.4282
Decanes Plus	0.060	0.0356	0.0711	0.1557
Total Weight Percent:	100.000			
Total TAP Emissions		1.56	3.12	6.83
Total VOC Emissions		**20.40**	**40.80**	**89.35**
Total Non VOC & Non TAP-HC		18.62	37.24	81.56
Total Emissions		59.25	118.50	259.52

Uncontrolled VOC Emission Total (TPY)	Storage Vapors + Oil Flash Gas	=	**209.54**

DATA:

Emission Source:	***Losses When Opening Thief Hatches***
Specific Gravity of Gas:	***1.079***
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)**	***14.91***

Avg. Hourly Emissions (lb/hr)	=	Annual Total/8760 (hrs/yr)	=	**0.31**
Maximum Hourly Emissions (lb/hr)	=	Max. Emission Rate * Max. Minutes/Hr Hatch is Open	=	**14.91**
Maximum Annual Emissions (TPY)	=	Max. Hourly THC Rate * Hours/Yr Hatch is Open	=	**1.34**

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)	2.380	0.007	0.355	0.032
Carbon Dioxide (excluded from VOC total)	31.760	0.097	4.735	0.426
Methane (excluded from VOC total)	28.448	0.087	4.242	0.382
Ethane (excluded from VOC total)	2.981	0.009	0.444	0.040
Hydrogen Sulfide (excluded from VOC total)	0.000	0.000	0.000	0.000
Propane	5.927	0.018	0.884	0.080
Iso-Butane	3.327	0.010	0.496	0.045
N-Butane	6.625	0.020	0.988	0.089
Iso-Pentane	4.483	0.014	0.668	0.060
N-Pentane	4.763	0.015	0.710	0.064
Iso-Hexane	2.387	0.007	0.356	0.032
N-Hexane (TAP)	2.487	0.008	0.371	0.033
Methylcyclopentane	0.999	0.003	0.149	0.013
Benzene (TAP)	0.068	0.000	0.010	0.001
Cyclohexane	0.574	0.002	0.086	0.008
Heptanes	1.503	0.005	0.224	0.020
Methylcyclohexane	0.325	0.001	0.048	0.004
Toluene (TAP)	0.042	0.000	0.006	0.001
2,2,4-Trimethylpentane (TAP)	0.000	0.000	0.000	0.000
Octanes	0.662	0.002	0.099	0.009
Ethylbenzene (TAP)	0.007	0.000	0.001	0.000
Xylenes (TAP)	0.027	0.000	0.004	0.000
Nonanes	0.165	0.001	0.025	0.002
Decanes Plus	0.060	0.000	0.009	0.001
Other NM/NE HC	0.000	0.000	0.000	0.000
Total Weight Percent:	100.000			
Total TAP Emissions		0.01	0.39	0.04
Total VOC Emissions		**0.11**	**5.13**	**0.46**
Total Non VOC & Non TAP-HC		0.10	4.69	0.42
Total Emissions		0.31	14.91	1.34

Emission Calculations

Emission calculations shown below are presented for informational purposes only as vapors from the oil storage tank are routed to the control flare (EPN: 15-05-F) for combustion, except during brief intervals when thief hatches are opened for purposes of sampling, gauging, etc.

POINT SOURCE I.D. NUMBER: ***9b-05-OST-CV***

EMISSION SOURCE DESCRIPTION: ***5000 BBL Dry Oil Storage Tank-Common Vent (T-2)***

DATA:

Emission Source:	***Crude Oil Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD - Q_{avg})**	***3,000***
Maximum Daily Oil Throughput: **(BBLD - Q_{max})**	***6,000***
Average VOC Working Losses - L_W (lb/yr):	***226,411.217***
Average VOC Standing Losses - L_S (lb/yr):	***13,913.712***
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 + LB) * 1.134/8760	=	**31.11**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Lb + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**60.42**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**136.26**

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	1.9289	3.7460	8.4484
Ethane (excluded from VOC total)	5.60	1.7422	3.3835	7.6308
Propane	17.60	5.4755	10.6339	23.9825
Iso-Butane	1.50	0.4667	0.9063	2.0440
N-Butane	27.10	8.4310	16.3738	36.9276
Iso-Pentane	1.50	0.4667	0.9063	2.0440
N-Pentane	14.60	4.5421	8.8213	19.8946
Heptane	9.20	2.8622	5.5586	12.5363
Octane	6.90	2.1466	4.1690	9.4022
Other NM/NE Hydrocarbons	1.80	0.5600	1.0876	2.4528

N-Hexane (TAP)	7.90	2.4577	4.7732	10.7649
Benzene (TAP)	0.10	0.0311	0.0604	0.1363
Total TAP Emissions		2.49	4.83	10.90
Total VOC Emissions		**27.44**	**53.29**	**120.19**
Total Non VOC & Non TAP-HC		3.67	7.13	16.08
Total Hydrocarbon Emissions		31.11	60.42	136.26

DATA:

Emission Source:	***Flash Gas from Oil***
Flash Gas Specific Gravity:	***1.079***
Average Oil Throughput: (BBLD)	***3,000***
Maximum Oil Throughput: (BBLD)	***6,000***
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 site under similar conditions (pressure & temperature), refer to Southern Petroleum Laboratories Report No.: 23120294-001A 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:			
44.08	43	75	
	0	60	5.75
		Prorated GOR Estimate:	**5.75**

Avg. Hourly Uncontrolled Flash Rate (SCF/Hr)	=	Oil Rate * GOR	=	**718.75**
Avg. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Flash Gas Gravity * Density of Air * Flash Rate	=	**59.25**
Max. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Avg. Emissions * Ratio of Max. Oil Rate to Avg. Oil Rate	=	**118.50**
Annual Potential Uncontrolled Flash Emissions (TPY)	=	Hourly * 8760/2000	=	**259.52**

SPECIATION FACTORS:

Speciation of the flash gas mixture taken from the referenced laboratory results; refer to Southern Petroleum Laboratories Report No.: 23120294-001A 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)	2.380	1.4102	2.8203	6.1765
Carbon Dioxide (excluded from VOC total)	31.760	18.8180	37.6360	82.4220
Methane (excluded from VOC total)	28.448	16.8556	33.7112	73.8268
Ethane (excluded from VOC total)	2.981	1.7663	3.5325	7.7361
Hydrogen Sulfide (excluded from VOC total)	0.000	0.0000	0.0000	0.0000

Propane	5.927	3.5118	7.0236	15.3815
Iso-Butane	3.327	1.9713	3.9425	8.6341
N-Butane	6.625	3.9254	7.8507	17.1929
Iso-Pentane	4.483	2.6562	5.3124	11.6341
N-Pentane	4.763	2.8221	5.6442	12.3607
Iso-Hexane	2.387	1.4143	2.8286	6.1946
N-Hexane (TAP)	2.487	1.4736	2.9471	6.4541
Methylcyclopentane	0.999	0.5919	1.1838	2.5926
Benzene (TAP)	0.068	0.0403	0.0806	0.1765
Cyclohexane	0.574	0.3401	0.6802	1.4896
Heptanes	1.503	0.8905	1.7811	3.9005
Methylcyclohexane	0.325	0.1926	0.3851	0.8434
Toluene (TAP)	0.042	0.0249	0.0498	0.1090
2,2,4-Trimethylpentane (TAP)	0.000	0.0000	0.0000	0.0000
Octanes	0.662	0.3922	0.7845	1.7180
Ethylbenzene (TAP)	0.007	0.0041	0.0083	0.0182
Xylenes (TAP)	0.027	0.0160	0.0320	0.0701
Nonanes	0.165	0.0978	0.1955	0.4282
Decanes Plus	0.060	0.0356	0.0711	0.1557
Total Weight Percent:	100.000			
Total TAP Emissions		1.56	3.12	6.83
Total VOC Emissions		**20.40**	**40.80**	**89.35**
Total Non VOC & Non TAP-HC		18.62	37.24	81.56
Total Emissions		59.25	118.50	259.52

Uncontrolled VOC Emission Total (TPY)	Storage Vapors + Oil Flash Gas	=	**209.54**

DATA:

Emission Source:	***Losses When Opening Thief Hatches***
Specific Gravity of Gas:	***1.079***
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)**	***14.91***

Avg. Hourly Emissions (lb/hr)	=	Total/8760 (hrs)	=	**0.31**
Maximum Hourly Emissions (lb/hr)	=	Max. Emission Rate * Max. Minutes/Hr Hatch is Open	=	**14.91**
Maximum Annual Emissions (TPY)	=	Max. Hourly THC Rate * Hours Hatch is Open	=	**1.34**

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)	2.380	0.007	0.355	0.032
Carbon Dioxide (excluded from VOC total)	31.760	0.097	4.735	0.426
Methane (excluded from VOC total)	28.448	0.087	4.242	0.382
Ethane (excluded from VOC total)	2.981	0.009	0.444	0.040
Hydrogen Sulfide (excluded from VOC total)	0.000	0.000	0.000	0.000
Propane	5.927	0.018	0.884	0.080
Iso-Butane	3.327	0.010	0.496	0.045
N-Butane	6.625	0.020	0.988	0.089
Iso-Pentane	4.483	0.014	0.668	0.060
N-Pentane	4.763	0.015	0.710	0.064
Iso-Hexane	2.387	0.007	0.356	0.032
N-Hexane (TAP)	2.487	0.008	0.371	0.033
Methylcyclopentane	0.999	0.003	0.149	0.013
Benzene (TAP)	0.068	0.000	0.010	0.001
Cyclohexane	0.574	0.002	0.086	0.008
Heptanes	1.503	0.005	0.224	0.020
Methylcyclohexane	0.325	0.001	0.048	0.004
Toluene (TAP)	0.042	0.000	0.006	0.001
2,2,4-Trimethylpentane (TAP)	0.000	0.000	0.000	0.000
Octanes	0.662	0.002	0.099	0.009
Ethylbenzene (TAP)	0.007	0.000	0.001	0.000
Xylenes (TAP)	0.027	0.000	0.004	0.000
Nonanes	0.165	0.001	0.025	0.002
Decanes Plus	0.060	0.000	0.009	0.001
Other NM/NE HC	0.000	0.000	0.000	0.000
Total Weight Percent:	100.000			
Total TAP Emissions		0.01	0.39	0.04
Total VOC Emissions		**0.11**	**5.13**	**0.46**
Total Non VOC & Non TAP-HC		0.10	4.69	0.42
Total Emissions		0.31	14.91	1.34

Emission Calculations

POINT SOURCE I.D. NUMBER: *9c-05-OST-CV*

EMISSION SOURCE DESCRIPTION: *1000 BBL Bad Oil Storage Tank-Common Vent (T-3)*

DATA:

Emission Source:	***Crude Oil Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD - Q_{avg})**	***8***
Maximum Daily Oil Throughput: **(BBLD - Q_{max})**	***8***
Average VOC Working Losses - L_W (lb/yr):	***602.572***
Average VOC Standing Losses - L_S (lb/yr):	***3,922.695***
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	=	**0.59**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**0.59**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**2.57**

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	0.0363	0.0363	0.1591
Ethane (excluded from VOC total)	5.60	0.0328	0.0328	0.1437
Propane	17.60	0.1031	0.1031	0.4516
Iso-Butane	1.50	0.0088	0.0088	0.0385
N-Butane	27.10	0.1588	0.1588	0.6953
Iso-Pentane	1.50	0.0088	0.0088	0.0385
N-Pentane	14.60	0.0855	0.0855	0.3746
Heptane	9.20	0.0539	0.0539	0.2361
Octane	6.90	0.0404	0.0404	0.1770
Other NM/NE Hydrocarbons	1.80	0.0105	0.0105	0.0462

N-Hexane (TAP)	7.90	0.0463	0.0463	0.2027
Benzene (TAP)	0.10	0.0006	0.0006	0.0026
Total TAP Emissions		0.05	0.05	0.21
Total VOC Emissions		**0.52**	**0.52**	**2.26**
Total Non VOC & Non TAP-HC		0.07	0.07	0.30
Total Hydrocarbon Emissions		0.59	0.59	2.57

VOC Emission Total (TPY)	=	Storage Vapors	=	**2.26**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***9d-05-WST-CV***

EMISSION SOURCE DESCRIPTION: ***1500 BBL Produced Water Skimmer Tank-Common Vent (T-4)***

DATA:

Emission Source:	***Crude Oil/Water Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD - Q_{avg})**	***4***
Maximum Daily Oil Throughput: **(BBLD - Q_{max})**	***8***
Average Daily Water Throughput: **(Annual Average; BBLD - Q_{avg})**	***4,000***
Maximum Daily Water Throughput: **(BBLD - Q_{max})**	***8,000***
Average VOC Working Losses - L_W (lb/yr):	***8,255.861***
Average VOC Standing Losses - L_S (lb/yr):	***144.039***
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	=	**1.09**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**2.16**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**4.76**

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	0.0674	0.1337	0.2953
Ethane (excluded from VOC total)	5.60	0.0609	0.1207	0.2667
Propane	17.60	0.1914	0.3795	0.8382
Iso-Butane	1.50	0.0163	0.0323	0.0714
N-Butane	27.10	0.2947	0.5843	1.2907
Iso-Pentane	1.50	0.0163	0.0323	0.0714
N-Pentane	14.60	0.1588	0.3148	0.6954
Heptane	9.20	0.1000	0.1984	0.4382
Octane	6.90	0.0750	0.1488	0.3286
Other NM/NE Hydrocarbons	1.80	0.0196	0.0388	0.0857

N-Hexane (TAP)	7.90	0.0859	0.1703	0.3763
Benzene (TAP)	0.10	0.0011	0.0022	0.0048
Total TAP Emissions		0.09	0.17	0.38
Total VOC Emissions		**0.96**	**1.90**	**4.20**
Total Non VOC & Non TAP-HC		0.13	0.25	0.56
Total Hydrocarbon Emissions		1.09	2.16	4.76

DATA:

Emission Source:	***Flash Gas from Oil***
Flash Gas Specific Gravity:	***1.079***
Average Oil Throughput: (BBLD)	***4***
Maximum Oil Throughput: (BBLD)	***8***
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 site under similar conditions (pressure & temperature), refer to Southern Petroleum Laboratories Report No.: 23120294-001A 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:			
44.08	43	75	
	0	60	5.75
		Prorated GOR Estimate:	**5.75**

Avg. Hourly Uncontrolled Flash Rate (SCF/Hr)	=	Oil Rate * GOR	=	**0.96**
Avg. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Flash Gas Gravity * Density of Air * Flash Rate	=	**0.08**
Max. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Avg. Emissions * Ratio of Max. Oil Rate to Avg. Oil Rate	=	**0.16**
Annual Potential Uncontrolled Flash Emissions (TPY)	=	Hourly * 8760/2000	=	**0.35**

SPECIATION FACTORS:

Speciation of the flash gas mixture taken from the referenced laboratory results; refer to Southern Petroleum Laboratories Report No.: 23120294-001A 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)	2.380	0.0019	0.0038	0.0083
Carbon Dioxide (excluded from VOC total)	31.760	0.0251	0.0503	0.1113
Methane (excluded from VOC total)	28.448	0.0225	0.0450	0.0997
Ethane (excluded from VOC total)	2.981	0.0024	0.0047	0.0104
Hydrogen Sulfide (excluded from VOC total)	0.000	0.0000	0.0000	0.0000

Propane	5.927	0.0047	0.0094	0.0208
Iso-Butane	3.327	0.0026	0.0053	0.0117
N-Butane	6.625	0.0052	0.0105	0.0232
Iso-Pentane	4.483	0.0035	0.0071	0.0157
N-Pentane	4.763	0.0038	0.0075	0.0167
Iso-Hexane	2.387	0.0019	0.0038	0.0084
N-Hexane (TAP)	2.487	0.0020	0.0039	0.0087
Methylcyclopentane	0.999	0.0008	0.0016	0.0035
Benzene (TAP)	0.068	0.0001	0.0001	0.0002
Cyclohexane	0.574	0.0005	0.0009	0.0020
Heptanes	1.503	0.0012	0.0024	0.0053
Methylcyclohexane	0.325	0.0003	0.0005	0.0011
Toluene (TAP)	0.042	0.0000	0.0001	0.0001
2,2,4-Trimethylpentane (TAP)	0.000	0.0000	0.0000	0.0000
Octanes	0.662	0.0005	0.0010	0.0023
Ethylbenzene (TAP)	0.007	0.0000	0.0000	0.0000
Xylenes (TAP)	0.027	0.0000	0.0000	0.0001
Nonanes	0.165	0.0001	0.0003	0.0006
Decanes Plus	0.060	0.0000	0.0001	0.0002
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		0.02	0.05	0.11
Total Emissions		0.08	0.16	0.35

DATA:

Emission Source:	***Flash Gas from Brine Solution***
Approx. Pressure Drop of Brine Solution: (psig)	***43***
Approx. Temperature of Brine Solution: (ºF)	***75***
Flash Gas Specific Gravity: ***(based on an actual brine flash analysis)***	***1.5234***
Avg. Brine Throughput: (BBLD)	***4000***
Max. Brine Throughput: (BBLD)	***8000***
Gas to Water Ratio: (SCF/BBL of Brine; GWR)	***20.4***
Basis of Emission Estimates:	***API Documentation & Actual Brine Flash Analysis***

Avg. Hourly Uncontrolled Flash Rate (SCF/Hr)	=	Brine Rate * GWR	=	**3400.00**
Avg. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Flash Gas Gravity * Density of Air * Flash Rate	=	**395.72**
Max. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Avg. Emissions * Ratio of Max. Water Rate to Avg. Water Rate	=	**791.44**
Annual Potential Uncontrolled Flash Emissions (TPY)	=	Hourly * 8760/2000	=	**1733.25**

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.: 13110657-001A 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)	0.032	0.1266	0.2533	0.5546
Carbon Dioxide (excluded from VOC total)	99.560	393.9772	787.9544	1725.6273
Methane (excluded from VOC total)	0.173	0.6846	1.3692	2.9985
Ethane (excluded from VOC total)	0.034	0.1345	0.2691	0.5893
Hydrogen Sulfide (excluded from VOC total)	0.000	0.0000	0.0000	0.0000
Propane	0.030	0.1187	0.2374	0.5200
Iso-Butane	0.007	0.0277	0.0554	0.1213
N-Butane	0.018	0.0712	0.1425	0.3120
Iso-Pentane	0.000	0.0000	0.0000	0.0000
N-Pentane	0.000	0.0000	0.0000	0.0000
Iso-Hexane	0.010	0.0396	0.0791	0.1733
N-Hexane (TAP)	0.006	0.0237	0.0475	0.1040
Methylcyclopentane	0.000	0.0000	0.0000	0.0000
Benzene (TAP)	0.033	0.1306	0.2612	0.5720
Cyclohexane	0.005	0.0198	0.0396	0.0867
Heptanes	0.020	0.0791	0.1583	0.3467
Methylcyclohexane	0.000	0.0000	0.0000	0.0000
Toluene (TAP)	0.011	0.0435	0.0871	0.1907
2,2,4-Trimethylpentane (TAP)	0.022	0.0871	0.1741	0.3813
Octanes	0.005	0.0198	0.0396	0.0867
Ethylbenzene (TAP)	0.001	0.0040	0.0079	0.0173
Xylenes (TAP)	0.010	0.0396	0.0791	0.1733
Nonanes	0.009	0.0356	0.0712	0.1560
Decanes Plus	0.014	0.0554	0.1108	0.2427
Total Weight Percent:	100.000			
Total TAP Emissions		0.33	0.66	1.44
Total VOC Emissions		**0.80**	**1.59**	**3.48**
Total Non VOC & Non TAP-HC		0.82	1.64	3.59
Total Emissions		395.72	791.44	1733.25

VOC Emission Total (TPY)	=	Storage Vapors + Oil Flash Gas + Brine Flash Gas	=	**7.80**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***9e-05-WST-CV***

EMISSION SOURCE DESCRIPTION: ***1500 BBL Produced Water Skimmer Tank-Common Vent (T-4B)***

DATA:

Emission Source:	***Crude Oil/Water Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD - Q_{avg})**	***4***
Maximum Daily Oil Throughput: **(BBLD - Q_{max})**	***8***
Average Daily Water Throughput: **(Annual Average; BBLD - Q_{avg})**	***4,000***
Maximum Daily Water Throughput: **(BBLD - Q_{max})**	***8,000***
Average VOC Working Losses - L_W (lb/yr):	***8,255.861***
Average VOC Standing Losses - L_S (lb/yr):	***144.039***
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	=	**1.09**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**2.16**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**4.76**

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	0.0674	0.1337	0.2953
Ethane (excluded from VOC total)	5.60	0.0609	0.1207	0.2667
Propane	17.60	0.1914	0.3795	0.8382
Iso-Butane	1.50	0.0163	0.0323	0.0714
N-Butane	27.10	0.2947	0.5843	1.2907
Iso-Pentane	1.50	0.0163	0.0323	0.0714
N-Pentane	14.60	0.1588	0.3148	0.6954
Heptane	9.20	0.1000	0.1984	0.4382
Octane	6.90	0.0750	0.1488	0.3286
Other NM/NE Hydrocarbons	1.80	0.0196	0.0388	0.0857

N-Hexane (TAP)	7.90	0.0859	0.1703	0.3763
Benzene (TAP)	0.10	0.0011	0.0022	0.0048
Total TAP Emissions		0.09	0.17	0.38
Total VOC Emissions		**0.96**	**1.90**	**4.20**
Total Non VOC & Non TAP-HC		0.13	0.25	0.56
Total Hydrocarbon Emissions		1.09	2.16	4.76

DATA:

Emission Source:	***Flash Gas from Oil***
Flash Gas Specific Gravity:	***1.079***
Average Oil Throughput: (BBLD)	***4***
Maximum Oil Throughput: (BBLD)	***8***
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 site under similar conditions (pressure & temperature), refer to Southern Petroleum Laboratories Report No.: 23120294-001A 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:			
44.08	43	75	
	0	60	5.75
		Prorated GOR Estimate:	**5.75**

Avg. Hourly Uncontrolled Flash Rate (SCF/Hr)	=	Oil Rate * GOR	=	**0.96**
Avg. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Flash Gas Gravity * Density of Air * Flash Rate	=	**0.08**
Max. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Avg. Emissions * Ratio of Max. Oil Rate to Avg. Oil Rate	=	**0.16**
Annual Potential Uncontrolled Flash Emissions (TPY)	=	Hourly * 8760/2000	=	**0.35**

SPECIATION FACTORS:

Speciation of the flash gas mixture taken from the referenced laboratory results; refer to Southern Petroleum Laboratories Report No.: 23120294-001A 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)	2.380	0.0019	0.0038	0.0083
Carbon Dioxide (excluded from VOC total)	31.760	0.0251	0.0503	0.1113
Methane (excluded from VOC total)	28.448	0.0225	0.0450	0.0997
Ethane (excluded from VOC total)	2.981	0.0024	0.0047	0.0104
Hydrogen Sulfide (excluded from VOC total)	0.000	0.0000	0.0000	0.0000

Propane	5.927	0.0047	0.0094	0.0208
Iso-Butane	3.327	0.0026	0.0053	0.0117
N-Butane	6.625	0.0052	0.0105	0.0232
Iso-Pentane	4.483	0.0035	0.0071	0.0157
N-Pentane	4.763	0.0038	0.0075	0.0167
Iso-Hexane	2.387	0.0019	0.0038	0.0084
N-Hexane (TAP)	2.487	0.0020	0.0039	0.0087
Methylcyclopentane	0.999	0.0008	0.0016	0.0035
Benzene (TAP)	0.068	0.0001	0.0001	0.0002
Cyclohexane	0.574	0.0005	0.0009	0.0020
Heptanes	1.503	0.0012	0.0024	0.0053
Methylcyclohexane	0.325	0.0003	0.0005	0.0011
Toluene (TAP)	0.042	0.0000	0.0001	0.0001
2,2,4-Trimethylpentane (TAP)	0.000	0.0000	0.0000	0.0000
Octanes	0.662	0.0005	0.0010	0.0023
Ethylbenzene (TAP)	0.007	0.0000	0.0000	0.0000
Xylenes (TAP)	0.027	0.0000	0.0000	0.0001
Nonanes	0.165	0.0001	0.0003	0.0006
Decanes Plus	0.060	0.0000	0.0001	0.0002
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		0.02	0.05	0.11
Total Emissions		0.08	0.16	0.35

DATA:

Emission Source:	***Flash Gas from Brine Solution***
Approx. Pressure Drop of Brine Solution: (psig)	***43***
Approx. Temperature of Brine Solution: (ºF)	***75***
Flash Gas Specific Gravity: ***(based on an actual brine flash analysis)***	***1.5234***
Avg. Brine Throughput: (BBLD)	***4000***
Max. Brine Throughput: (BBLD)	***8000***
Gas to Water Ratio: (SCF/BBL of Brine; GWR)	***20.4***
Basis of Emission Estimates:	***API Documentation & Actual Brine Flash Analysis***

Avg. Hourly Uncontrolled Flash Rate (SCF/Hr)	=	Brine Rate * GWR	=	**3400.00**
Avg. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Flash Gas Gravity * Density of Air * Flash Rate	=	**395.72**
Max. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Avg. Emissions * Ratio of Max. Water Rate to Avg. Water Rate	=	**791.44**
Annual Potential Uncontrolled Flash Emissions (TPY)	=	Hourly * 8760/2000	=	**1733.25**

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.: 13110657-001A 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)	0.032	0.1266	0.2533	0.5546
Carbon Dioxide (excluded from VOC total)	99.560	393.9772	787.9544	1725.6273
Methane (excluded from VOC total)	0.173	0.6846	1.3692	2.9985
Ethane (excluded from VOC total)	0.034	0.1345	0.2691	0.5893
Hydrogen Sulfide (excluded from VOC total)	0.000	0.0000	0.0000	0.0000
Propane	0.030	0.1187	0.2374	0.5200
Iso-Butane	0.007	0.0277	0.0554	0.1213
N-Butane	0.018	0.0712	0.1425	0.3120
Iso-Pentane	0.000	0.0000	0.0000	0.0000
N-Pentane	0.000	0.0000	0.0000	0.0000
Iso-Hexane	0.010	0.0396	0.0791	0.1733
N-Hexane (TAP)	0.006	0.0237	0.0475	0.1040
Methylcyclopentane	0.000	0.0000	0.0000	0.0000
Benzene (TAP)	0.033	0.1306	0.2612	0.5720
Cyclohexane	0.005	0.0198	0.0396	0.0867
Heptanes	0.020	0.0791	0.1583	0.3467
Methylcyclohexane	0.000	0.0000	0.0000	0.0000
Toluene (TAP)	0.011	0.0435	0.0871	0.1907
2,2,4-Trimethylpentane (TAP)	0.022	0.0871	0.1741	0.3813
Octanes	0.005	0.0198	0.0396	0.0867
Ethylbenzene (TAP)	0.001	0.0040	0.0079	0.0173
Xylenes (TAP)	0.010	0.0396	0.0791	0.1733
Nonanes	0.009	0.0356	0.0712	0.1560
Decanes Plus	0.014	0.0554	0.1108	0.2427
Total Weight Percent:	100.000			
Total TAP Emissions		0.33	0.66	1.44
Total VOC Emissions		**0.80**	**1.59**	**3.48**
Total Non VOC & Non TAP-HC		0.82	1.64	3.59
Total Emissions		395.72	791.44	1733.25

VOC Emission Total (TPY)	=	Storage Vapors + Oil Flash Gas + Brine Flash Gas	=	**7.80**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***9f-05-WST-CV***

EMISSION SOURCE DESCRIPTION: ***3000 BBL Produced Water Storage Tank-Common Vent (T-7)***

DATA:

Emission Source:	***Crude Oil Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD - Q_{avg})**	***0***
Maximum Daily Oil Throughput: **(BBLD - Q_{max})**	***0***
Average VOC Working Losses - L_W (lb/yr):	***0.000***
Average VOC Standing Losses - L_S (lb/yr):	***267.677***
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	=	**0.15**

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	0.0021	0.0021	0.0094
Ethane (excluded from VOC total)	5.60	0.0019	0.0019	0.0085
Propane	17.60	0.0061	0.0061	0.0267
Iso-Butane	1.50	0.0005	0.0005	0.0023
N-Butane	27.10	0.0094	0.0094	0.0411
Iso-Pentane	1.50	0.0005	0.0005	0.0023
N-Pentane	14.60	0.0051	0.0051	0.0222
Heptane	9.20	0.0032	0.0032	0.0140
Octane	6.90	0.0024	0.0024	0.0105
Other NM/NE Hydrocarbons	1.80	0.0006	0.0006	0.0027

N-Hexane (TAP)	7.90	0.0027	0.0027	0.0120
Benzene (TAP)	0.10	0.0000	0.0000	0.0002
Total TAP Emissions		0.00	0.00	0.01
Total VOC Emissions		**0.03**	**0.03**	**0.13**
Total Non VOC & Non TAP-HC		0.00	0.00	0.02
Total Hydrocarbon Emissions		0.03	0.03	0.15

VOC Emission Total (TPY)	=	Storage Vapors	=	**0.13**

Emission Calculations

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

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

DATA:

Emission Source:	***Water Storage Vapors ('Working' & 'Standing')***
Average Daily Water Throughput: **(Annual Average; BBLD - Q_{avg})**	***10.96***
Maximum Daily Water Throughput: **(BBLD - Q_{max})**	***27.40***
Average VOC Working Losses - L_w (lb/yr):	***22.005***
Average VOC Standing Losses - L_S (lb/yr):	***102.911***
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	=	**0.07**

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	0.0010	0.0013	0.0044
Ethane (excluded from VOC total)	5.60	0.0009	0.0011	0.0040
Propane	17.60	0.0028	0.0036	0.0125
Iso-Butane	1.50	0.0002	0.0003	0.0011
N-Butane	27.10	0.0044	0.0055	0.0192
Iso-Pentane	1.50	0.0002	0.0003	0.0011
N-Pentane	14.60	0.0024	0.0030	0.0103
Heptane	9.20	0.0015	0.0019	0.0065
Octane	6.90	0.0011	0.0014	0.0049
Other NM/NE Hydrocarbons	1.80	0.0003	0.0004	0.0013

N-Hexane (TAP)	7.90	0.0013	0.0016	0.0056
Benzene (TAP)	0.10	0.0000	0.0000	0.0001
Total TAP Emissions		0.00	0.00	0.01
Total VOC Emissions		**0.01**	**0.02**	**0.06**
Total Non VOC & Non TAP-HC		0.00	0.00	0.01
Total Hydrocarbon Emissions		0.02	0.02	0.07

Calculated Avg. Gas Flowrate (SCFH) =	*0.15*

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	8,400
Produced Water	1.7685	3.36	168,000
Total Throughput (gallons/yr) =			176,400

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		**Hours/Year**	**Specific Gravity**	**Hourly (lb/hr)**	**Annual (TPY)**
8,400		8760	0.92	7.36	32.23
Emission Factors*					
A_1	A_2	A_5	A_6	*Throughput Factor (lb/yr)*	*City Factor*
170	*3*	*169*	*3*	*250,000*	*1.31*
A_1 (lb/yr) = 57.41		A_2 (lb/yr) = 1.01		A_5 (lb/yr) = 57.08	A_6 (lb/yr) = 1.01
				Total ΣTPY=	0.06

POLLUTANT:**	**Weight Percent**	**CALCULATED EMISSION RATES**	
		Hourly (lb/hr)	**Annual (TPY)**
VOCs	100.00	0.0133	0.0583
Total Weight Percent:	100.00		
Total TAP Emissions		0.01	0.06
Total VOC Emissions		**0.01**	**0.06**
Total Non VOC & Non TAP-HC		0.00	0.00
Total Emissions		0.01	0.06

**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:		Produced Water			
CHEMICAL USAGE				CHEMICAL THROUGHPUT	
Gallons/Year		Hours/Year	Specific Gravity	Hourly (lb/hr)	Annual (TPY)
168,000		8760	1.7685	282.86	1238.94
Emission Factors*					
A_1	A_2	A_5	A_6	*Throughput Factor (lb/yr)*	*City Factor*
6794	*112*	*2253*	*111*	*10,000,000*	*1.31*
A_1 (lb/yr) = 2205.35		A_2 (lb/yr) = 36.36		A_5 (lb/yr) = 731.33	A_6 (lb/yr) = 36.03
				Total ΣTPY=	1.50

POLLUTANT:**	Weight Percent	CALCULATED EMISSION RATES	
		Hourly (lb/hr)	Annual (TPY)
Methane (excluded from VOC total)	6.20	0.0213	0.0933
Ethane (excluded from VOC total)	5.60	0.0192	0.0843
Hydrogen Sulfide (excluded from VOC total)	0.00	0.0000	0.0000
Propane	17.60	0.0605	0.2648
Iso-Butane	1.50	0.0052	0.0226
N-Butane	27.10	0.0931	0.4077
Iso-Pentane	1.50	0.0052	0.0226
N-Pentane	14.60	0.0502	0.2197
Heptanes	9.20	0.0316	0.1384
Octane	6.90	0.0237	0.1038
Other NM/NE Hydrocarbons	1.80	0.0062	0.0271
N-Hexane (TAP)	7.90	0.0271	0.1189
Benzene (TAP)	0.10	0.0003	0.0015
Total Weight Percent:	100.00		
Total TAP Emissions		0.03	0.12
Total VOC Emissions		**0.30**	**1.33**
Total Non VOC & Non TAP-HC		0.04	0.18
Total Emissions		0.34	1.50

**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.

VOC Emission Total (TPY)	=	Storage Vapors + Blending Emissions	=	**1.45**

Emission Calculations

POINT SOURCE I.D. NUMBER: *11-05-IOT-V*

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

DATA:

Emission Source:	***Water Storage Vapors ('Working' & 'Standing')***
Average Daily Water Throughput: **(Average; BBLD - Q_{avg})**	***16.44***
Maximum Daily Water Throughput: **(BBLD - Q_{max})**	***27.40***
Average VOC Working Losses - L_W (lb/yr):	***32.692***
Average VOC Standing Losses - L_S (lb/yr):	***137.834***
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	=	**0.10**

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	0.0014	0.0015	0.0060
Ethane (excluded from VOC total)	5.60	0.0012	0.0014	0.0054
Propane	17.60	0.0039	0.0044	0.0170
Iso-Butane	1.50	0.0003	0.0004	0.0015
N-Butane	27.10	0.0060	0.0067	0.0262
Iso-Pentane	1.50	0.0003	0.0004	0.0015
N-Pentane	14.60	0.0032	0.0036	0.0141
Heptane	9.20	0.0020	0.0023	0.0089
Octane	6.90	0.0015	0.0017	0.0067
Other NM/NE Hydrocarbons	1.80	0.0004	0.0004	0.0017

N-Hexane (TAP)	7.90	0.0017	0.0020	0.0076
Benzene (TAP)	0.10	0.0000	0.0000	0.0001
Total TAP Emissions		0.00	0.00	0.01
Total VOC Emissions		**0.02**	**0.02**	**0.09**
Total Non VOC & Non TAP-HC		0.00	0.00	0.01
Total Hydrocarbon Emissions		0.02	0.02	0.10

Calculated Avg. Gas Flowrate (SCFH) =	*0.15*

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	12,600
Produced Water	1.7685	3.36	252,000
Total Throughput (gallons/yr) =			264,600

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		**Hours/Year**	**Specific Gravity**	**Hourly (lb/hr)**	**Annual (TPY)**
12,600		8760	0.92	11.04	48.34
Emission Factors*					
A_1	A_2	A_5	A_6	*Throughput Factor (lb/yr)*	*City Factor*
170	*3*	*169*	*3*	*250,000*	*1.31*
A_1 (lb/yr) = 86.12		A_2 (lb/yr) = 1.52		A_5 (lb/yr) = 85.61	A_6 (lb/yr) = 1.52
				Total ΣTPY=	0.09

POLLUTANT:**	**Weight Percent**	**CALCULATED EMISSION RATES**	
		Hourly (lb/hr)	**Annual (TPY)**
VOCs	100.00	0.0200	0.0874
Total Weight Percent:	100.00		
Total TAP Emissions		0.02	0.09
Total VOC Emissions		**0.02**	**0.09**
Total Non VOC & Non TAP-HC		0.00	0.00
Total Emissions		0.02	0.09

**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:		Produced Water			
CHEMICAL USAGE				CHEMICAL THROUGHPUT	
Gallons/Year		Hours/Year	Specific Gravity	Hourly (lb/hr)	Annual (TPY)
252,000		8760	1.7685	424.29	1858.41
Emission Factors*					
A_1	A_2	A_5	A_6	*Throughput Factor (lb/yr)*	*City Factor*
6794	*112*	*2253*	*111*	*10,000,000*	*1.31*
A_1 (lb/yr) = 3308.02		A_2 (lb/yr) = 54.53		A_5 (lb/yr) = 1,096.99	A_6 (lb/yr) = 54.05
				Total ΣTPY=	2.26

POLLUTANT:**	Weight Percent	CALCULATED EMISSION RATES	
		Hourly (lb/hr)	Annual (TPY)
Methane (excluded from VOC total)	6.20	0.0319	0.1399
Ethane (excluded from VOC total)	5.60	0.0289	0.1264
Hydrogen Sulfide (excluded from VOC total)	0.00	0.0000	0.0000
Propane	17.60	0.0907	0.3972
Iso-Butane	1.50	0.0077	0.0339
N-Butane	27.10	0.1396	0.6116
Iso-Pentane	1.50	0.0077	0.0339
N-Pentane	14.60	0.0752	0.3295
Heptanes	9.20	0.0474	0.2076
Octane	6.90	0.0356	0.1557
Other NM/NE Hydrocarbons	1.80	0.0093	0.0406
N-Hexane (TAP)	7.90	0.0407	0.1783
Benzene (TAP)	0.10	0.0005	0.0023
Total Weight Percent:	100.00		
Total TAP Emissions		0.04	0.18
Total VOC Emissions		**0.45**	**1.99**
Total Non VOC & Non TAP-HC		0.06	0.27
Total Emissions		0.52	2.26

**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.

VOC Emission Total (TPY)	=	Storage Vapors + Blending Emissions	=	**2.17**

Emission Calculations

POINT SOURCE I.D. NUMBER: *12-05-OST-V*

EMISSION SOURCE DESCRIPTION: *400 BBL Sand Blowdown Pit Tank-Vent (T-150)*

DATA:

Emission Source:	***Crude Oil Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD - Q_{avg})**	***0***
Maximum Daily Oil Throughput: **(BBLD - Q_{max})**	***0***
Average VOC Working Losses - L_W (lb/yr):	***0.000***
Average VOC Standing Losses - L_S (lb/yr):	***1,269.150***
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	=	**0.16**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**0.16**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**0.72**

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	0.0102	0.0102	0.0446
Ethane (excluded from VOC total)	5.60	0.0092	0.0092	0.0403
Propane	17.60	0.0289	0.0289	0.1267
Iso-Butane	1.50	0.0025	0.0025	0.0108
N-Butane	27.10	0.0445	0.0445	0.1950
Iso-Pentane	1.50	0.0025	0.0025	0.0108
N-Pentane	14.60	0.0240	0.0240	0.1051
Heptane	9.20	0.0151	0.0151	0.0662
Octane	6.90	0.0113	0.0113	0.0497
Other NM/NE Hydrocarbons	1.80	0.0030	0.0030	0.0130

N-Hexane (TAP)	7.90	0.0130	0.0130	0.0568
Benzene (TAP)	0.10	0.0002	0.0002	0.0007
Total TAP Emissions		0.01	0.01	0.06
Total VOC Emissions		**0.14**	**0.14**	**0.63**
Total Non VOC & Non TAP-HC		0.02	0.02	0.08
Total Hydrocarbon Emissions		0.16	0.16	0.72

VOC Emission Total (TPY)	=	Storage Vapors	=	**0.63**

Emission Calculations

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

EMISSION SOURCE DESCRIPTION: ***Process Sump (P-106)***

DATA:

Emission Source:	***Flash Gas from Brine Solution****
Max. Pressure Drop of Brine Solution: (psig)	***830***
Approx. Temperature of Brine Solution: (^oF)	***80***
Flash Gas Specific Gravity: ***(based on an actual brine flash analysis)***	***1.5234***
Avg. Brine Throughput: (BBL/Hr)	***50***
Max. Brine Throughput: (BBL/Hr)	***50***
Blowdown Hours:	***730***
Gas to Water Ratio: (SCF/BBL of Brine; GWR)	***20.4***
Basis of Emission Estimates:	***API Documentation & Actual Brine Flash Analysis***

**Associated with HP separator blowdowns*

Avg. Hourly Uncontrolled Flash Rate (SCF/Hr)	=	Brine Rate * GWR	=	**1020.00**
Avg. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Flash Gas Gravity * Density of Air * Flash Rate	=	**118.72**
Max. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Hourly * Ratio of Max. Water Rate to Avg. Water Rate	=	**118.72**
Annual Potential Uncontrolled Flash Emissions (TPY)	=	Hourly * Blowdown Hours/2000	=	**43.33**

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.: 13110657-001A 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)	0.032	0.0380	0.0380	0.0139
Carbon Dioxide (excluded from VOC total)	99.560	118.1932	118.1932	43.1421
Methane (excluded from VOC total)	0.173	0.2054	0.2054	0.0750
Ethane (excluded from VOC total)	0.034	0.0404	0.0404	0.0147
Hydrogen Sulfide (excluded from VOC total)	0.000	0.0000	0.0000	0.0000
Propane	0.030	0.0356	0.0356	0.0130
Iso-Butane	0.007	0.0083	0.0083	0.0030
N-Butane	0.018	0.0214	0.0214	0.0078
Iso-Pentane	0.000	0.0000	0.0000	0.0000
N-Pentane	0.000	0.0000	0.0000	0.0000
Iso-Hexane	0.010	0.0119	0.0119	0.0043

N-Hexane (TAP)	0.006	0.0071	0.0071	0.0026
Methylcyclopentane	0.000	0.0000	0.0000	0.0000
Benzene (TAP)	0.033	0.0392	0.0392	0.0143
Cyclohexane	0.005	0.0059	0.0059	0.0022
Heptanes	0.020	0.0237	0.0237	0.0087
Methylcyclohexane	0.000	0.0000	0.0000	0.0000
Toluene (TAP)	0.011	0.0131	0.0131	0.0048
2,2,4-Trimethylpentane (TAP)	0.022	0.0261	0.0261	0.0095
Octanes	0.005	0.0059	0.0059	0.0022
Ethylbenzene (TAP)	0.001	0.0012	0.0012	0.0004
Xylenes (TAP)	0.010	0.0119	0.0119	0.0043
Nonanes	0.009	0.0107	0.0107	0.0039
Decanes Plus	0.014	0.0166	0.0166	0.0061
Total Weight Percent:	100.000			
Total TAP Emissions		0.10	0.10	0.04
Total VOC Emissions		**0.24**	**0.24**	**0.09**
Total Non VOC & Non TAP-HC		0.25	0.25	0.09
Total Emissions		118.72	118.72	43.33

VOC Emission Total (TPY)	=	Brine Flash Gas	=	**0.09**

Emission Calculations

POINT SOURCE I.D. NUMBERS: ***14-05-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):	***15***
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)		Annual Emissions (TPY)	
	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]	15		15	1.3E-02	2.4E-03	0.430	N/A	1.88	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:	**2,177**	**2,667**	**4,844**			**3.80**	**6.12**	**16.66**	**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)	Annual (TPY)
Hydrogen Sulfide (TAP; excluded from VOC total)	0.0	0.0000	0.0000
NMEHC (expressed as VOC)	29.2	1.1104	4.8634
Benzene (TAP)	0.027	0.0010	0.0045
Ethylbenzene (TAP)	0.0170	0.0006	0.0028
Toluene (TAP)	0.075	0.0029	0.0125
Xylenes (m,p,o) (TAP)	0.036	0.0014	0.0060
TOTAL TAP EMISSIONS:		0.01	0.03
TOTAL VOC EMISSIONS:		**1.11**	**4.86**

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.: 172-23110273-001A in ensuing pages.

EMISSIONS SUMMARY:

Component	Weight Percent	Calculated Emission Rate	
		Avg. Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.3486	0.0213	0.0934
Carbon Dioxide (excluded from VOC total)	92.6895	5.6698	24.8336
Methane (excluded from VOC total)	3.3679	0.2060	0.9023
Ethane (excluded from VOC total)	0.8826	0.0540	0.2365
Hydrogen Sulfide (TAP; excluded from VOC total)	0.0000	0.0000	0.0000
Propane	0.8429	0.0516	0.2258
Iso-Butane	0.2572	0.0157	0.0689
N-Butane	0.5119	0.0313	0.1371
Iso-Pentane	0.2670	0.0163	0.0715
N-Pentane	0.2024	0.0124	0.0542
Iso-Hexanes	0.1526	0.0093	0.0409
N-Hexane (TAP)	0.0793	0.0049	0.0212
Methylcyclopentane	0.0000	0.0000	0.0000
Benzene (TAP)	0.0146	0.0009	0.0039
Cyclohexane	0.0459	0.0028	0.0123
Heptanes	0.1426	0.0087	0.0382
Methylcyclohexane	0.0526	0.0032	0.0141
Toluene (TAP)	0.0075	0.0005	0.0020

2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000
Octanes	0.0741	0.0045	0.0199
Ethylbenzene (TAP)	0.0000	0.0000	0.0000
Xylenes (TAP)	0.0031	0.0002	0.0008
Nonanes	0.0481	0.0029	0.0129
Decanes Plus	0.0096	0.0006	0.0026
TOTAL WEIGHT PERCENT:	100.0000		
TOTAL TAP EMISSIONS:		0.01	0.03
TOTAL VOC EMISSIONS:		**0.17**	**0.73**
TOTAL Non-VOC & Non-TAP HC		0.26	1.14
TOTAL Emissions		6.12	26.79

Facility-Wide VOC Fugitive Totals	=	**1.28 lb/hr**	**5.59 TPY**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***15-05-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):	***489***
Purge Gas Feed:	***Yes***
Gas Heat of Combustion (BTU/Ft^3-actual fuel gas analysis):	***1121***
Flare Gas Feed:	***Yes***
Gas Heat of Combustion (BTU/Ft^3-actual fuel gas analysis):	***1121***
Pilot Gas Feed:	***Yes***
Gas Heat of Combustion (BTU/Ft^3-actual fuel gas analysis):	***1121***
Combustion Efficiency:	***98% for all HC***

Gas Stream #1 - Oil Storage Tank Vapors

Gas volume estimates are supported by the calculations associated with EPNs: 9a-05-OST-CV & 9b-05-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*
1,898	*8760*	*98*	*489*	*1.1814*

CALCULATIONS

Gas Combusted (annual hourly average)	=	*gas rate (scf/hr)*	*x*	*efficiency*	*x*	*usage (hrs)*
	=	*1,898*	*x*	*0.98*	*x*	*8,760*
	=	***16,293,950 scf***		=	***1,860 SCF/hr***	
Heat Content (annual hourly average)	=	gas rate (scf/yr)	x	gas heat of combustion (BTU/scf)		
	=	*16,293,950*	*x*	*489*		
	=			***0.9096 MMBTU/Hr***		
Uncontrolled Max. Hourly Emissions (lbs/hr)	=	*gas specific gravity*	*x*	*density of air (lb/SCF)*	*x*	*Maximum Gas Rate (SCF/Hr)*
	=	*1.1814*	*x*	*0.0764*	*x*	*1,898*
	=	***171.31 lbs/hr***				
Uncontrolled Annual Emissions (TPY)	=	*gas specific gravity*	*x*	*density of air (tons/SCF)*	*x*	*Total Gas Rate (SCF/Yr)*
	=	*1.1814*	*x*	*0.0000382*	*x*	*16,626,480*
	=	***750.34 TPY***				

SPECIATION FACTORS:

Speciation of the flash gas mixture is based on an actual flare gas analysis; refer to Southern Petroleum Laboratories Report No.: 172-23090296-001A 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)	71.4111	122.3354	122.3354	535.8292
Carbon Dioxide (excluded from VOC total)	2.2059	3.7790	3.7790	16.5518
Methane (excluded from VOC total)	0.0194	0.0007	0.0007	0.0029

Ethane (excluded from VOC total)	0.1146	0.0039	0.0039	0.0172
Hydrogen Sulfide (TAP; excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	0.4156	0.0142	0.0142	0.0624
Iso-Butane	0.2849	0.0098	0.0098	0.0428
N-Butane	1.4706	0.0504	0.0504	0.2207
Iso-Pentane	2.0056	0.0687	0.0687	0.3010
N-Pentane	4.5812	0.1570	0.1570	0.6875
Iso-Hexanes	5.7309	0.1964	0.1964	0.8600
N-Hexane (TAP)	4.1134	0.1409	0.1409	0.6173
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.2143	0.0073	0.0073	0.0322
Cyclohexane	0.9304	0.0319	0.0319	0.1396
Heptanes	5.5428	0.1899	0.1899	0.8318
Methylcyclohexane	0.4591	0.0157	0.0157	0.0689
Toluene (TAP)	0.0429	0.0015	0.0015	0.0064
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.4093	0.0140	0.0140	0.0614
Ethylbenzene (TAP)	0.0016	0.0001	0.0001	0.0002
Xylenes (TAP)	0.0044	0.0002	0.0002	0.0007
Nonanes	0.0391	0.0013	0.0013	0.0059
Decanes Plus	0.0029	0.0001	0.0001	0.0004
Other NM/NE HC	0.0000	0.0000	0.0000	0.0000
TOTAL WEIGHT PERCENT:	100.0000			
TOTAL TAP EMISSIONS:		0.15	0.15	0.66
TOTAL VOC EMISSIONS:		**0.90**	**0.90**	**3.94**
TOTAL Non-VOC & Non-TAP HC:		0.00	0.00	0.02
TOTAL EMISSIONS:		127.02	127.02	556.34

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*	*1121*		*0.7309*	
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*	*1121*		
	=			***0.1648 MMBTU/Hr***		
Uncontrolled Max. Hourly Emissions (lbs/hr)	=	*gas specific gravity*	*x*	*density of air (lb/SCF)*	*x*	*Maximum Gas Rate (SCF/Hr)*
	=	*0.7309*	*x*	*0.0764*	*x*	*150*
	=	***8.38 lbs/hr***				
Uncontrolled Annual Emissions (TPY)	=	*gas specific gravity*	*x*	*density of air (tons/SCF)*	*x*	*Total Gas Rate (SCF/Yr)*
	=	*0.7309*	*x*	*0.0000382*	*x*	*1,314,000*
	=	***36.69 TPY***				

SPECIATION FACTORS:

Speciation of the purge gas mixture is based on an actual fuel gas analysis; refer to Southern Petroleum Laboratories Report No.: 2030-22100272-001A 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)	2.409	0.2018	0.2018	0.8838
Carbon Dioxide (excluded from VOC total)	9.701	0.8126	0.8126	3.5590
Methane (excluded from VOC total)	60.257	0.1009	0.1009	0.4421
Ethane (excluded from VOC total)	11.334	0.0190	0.0190	0.0832
Hydrogen Sulfide (TAP; excluded from VOC total)	0.000	0.0000	0.0000	0.0000
Propane	7.002	0.0117	0.0117	0.0514
Iso-Butane	1.831	0.0031	0.0031	0.0134
N-Butane	2.999	0.0050	0.0050	0.0220
Iso-Pentane	1.388	0.0023	0.0023	0.0102
N-Pentane	0.998	0.0017	0.0017	0.0073
Iso-Hexanes	0.775	0.0013	0.0013	0.0057
N-Hexane (TAP)	0.334	0.0006	0.0006	0.0025
Methylcyclopentane	0.000	0.0000	0.0000	0.0000
Benzene (TAP)	0.106	0.0002	0.0002	0.0008
Cyclohexane	0.000	0.0000	0.0000	0.0000
Heptanes	0.628	0.0011	0.0011	0.0046
Methylcyclohexane	0.000	0.0000	0.0000	0.0000
Toluene (TAP)	0.043	0.0001	0.0001	0.0003
2,2,4-Trimethylpentane (TAP)	0.165	0.0003	0.0003	0.0012
Octanes	0.009	0.0000	0.0000	0.0001
Ethylbenzene (TAP)	0.000	0.0000	0.0000	0.0000
Xylenes (TAP)	0.001	0.0000	0.0000	0.0000
Nonanes	0.018	0.0000	0.0000	0.0001
Decanes Plus	0.002	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:		**0.03**	**0.03**	**0.12**
TOTAL Non-VOC & Non-TAP HC:		0.12	0.12	0.53
TOTAL EMISSIONS:		1.16	1.16	5.09

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*	
15,000	*8760*	*98*	*1121*	*0.7309*	

CALCULATIONS						
Gas Combusted (annual hourly average)	=	*gas rate (scf/hr)*	*x*	*efficiency*	*x*	*usage (hrs)*
	=	*15,000*	*x*	*0.98*	*x*	*8,760*
	=	***128,772,000 scf***		=	***14,700 SCF/hr***	
Heat Content (annual hourly average)	=	gas rate (scf/yr)	x	gas heat of combustion (BTU/scf)		
	=	*128,772,000*	*x*	*1121*		
	=				***16.4787 MMBTU/Hr***	
Uncontrolled Max. Hourly Emissions (lbs/hr)	=	*gas specific gravity*	*x*	*density of air (lb/SCF)*	*x*	*Maximum Gas Rate (SCF/Hr)*
	=	*0.7309*	*x*	*0.0764*	*x*	*15,000*
	=	***837.61 lbs/hr***				
Uncontrolled Annual Emissions (TPY)	=	*gas specific gravity*	*x*	*density of air (tons/SCF)*	*x*	*Total Gas Rate (SCF/Yr)*
	=	*0.7309*	*x*	*0.0000382*	*x*	*131,400,000*
	=	***3,668.74 TPY***				

SPECIATION FACTORS:

Speciation of the flare gas mixture is based on an actual fuel gas analysis; refer to Southern Petroleum Laboratories Report No.: 2030-22100272-001A 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)	2.409	20.1781	20.1781	88.3799
Carbon Dioxide (excluded from VOC total)	9.701	81.2567	81.2567	355.9043
Methane (excluded from VOC total)	60.257	10.0944	10.0944	44.2134
Ethane (excluded from VOC total)	11.334	1.8987	1.8987	8.3163
Hydrogen Sulfide (TAP; excluded from VOC total)	0.000	0.0000	0.0000	0.0000
Propane	7.002	1.1730	1.1730	5.1377
Iso-Butane	1.831	0.3067	0.3067	1.3435
N-Butane	2.999	0.5024	0.5024	2.2005
Iso-Pentane	1.388	0.2325	0.2325	1.0184
N-Pentane	0.998	0.1672	0.1672	0.7323
Iso-Hexanes	0.775	0.1298	0.1298	0.5687
N-Hexane (TAP)	0.334	0.0560	0.0560	0.2451
Methylcyclopentane	0.000	0.0000	0.0000	0.0000
Benzene (TAP)	0.106	0.0178	0.0178	0.0778
Cyclohexane	0.000	0.0000	0.0000	0.0000
Heptanes	0.628	0.1052	0.1052	0.4608
Methylcyclohexane	0.000	0.0000	0.0000	0.0000
Toluene (TAP)	0.043	0.0072	0.0072	0.0316
2,2,4-Trimethylpentane (TAP)	0.165	0.0276	0.0276	0.1211
Octanes	0.009	0.0015	0.0015	0.0066
Ethylbenzene (TAP)	0.000	0.0000	0.0000	0.0000
Xylenes (TAP)	0.001	0.0002	0.0002	0.0007

Nonanes	0.018	0.0030	0.0030	0.0132
Decanes Plus	0.002	0.0003	0.0003	0.0015
Other Nm/NE HC	0.000	0.0000	0.0000	0.0000
TOTAL WEIGHT PERCENT:	100.000			
TOTAL TAP EMISSIONS:		0.11	0.11	0.48
TOTAL VOC EMISSIONS:		**2.73**	**2.73**	**11.96**
TOTAL Non-VOC & Non-TAP HC:		11.99	11.99	52.53
TOTAL EMISSIONS:		116.16	116.16	508.77

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	*8760*	*98*	*1121*	*0.7309*	

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*	*1121*		
	=			***0.1648 MMBTU/Hr***		
Uncontrolled Max. Hourly Emissions (lbs/hr)	=	*gas specific gravity*	*x*	*density of air (lb/SCF)*	*x*	*Maximum Gas Rate (SCF/Hr)*
	=	*0.7309*	*x*	*0.0764*	*x*	*150*
	=	***8.38 lbs/hr***				
Uncontrolled Annual Emissions (TPY)	=	*gas specific gravity*	*x*	*density of air (tons/SCF)*	*x*	*Total Gas Rate (SCF/Yr)*
	=	*0.7309*	*x*	*0.0000382*	*x*	*1,314,000*
	=	***36.69 TPY***				

SPECIATION FACTORS:

Speciation of the pilot gas is based on an actual fuel gas analysis; refer to Southern Petroleum Laboratories Report No.: 2030-22100272-001A 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)	2.409	0.2018	0.2018	0.8838
Carbon Dioxide (excluded from VOC total)	9.701	0.8126	0.8126	3.5590
Methane (excluded from VOC total)	60.257	0.1009	0.1009	0.4421
Ethane (excluded from VOC total)	11.334	0.0190	0.0190	0.0832
Hydrogen Sulfide (TAP; excluded from VOC total)	0.000	0.0000	0.0000	0.0000
Propane	7.002	0.0117	0.0117	0.0514
Iso-Butane	1.831	0.0031	0.0031	0.0134
N-Butane	2.999	0.0050	0.0050	0.0220
Iso-Pentane	1.388	0.0023	0.0023	0.0102
N-Pentane	0.998	0.0017	0.0017	0.0073
Iso-Hexanes	0.775	0.0013	0.0013	0.0057
N-Hexane (TAP)	0.334	0.0006	0.0006	0.0025
Methylcyclopentane	0.000	0.0000	0.0000	0.0000

Benzene (TAP)	0.106	0.0002	0.0002	0.0008
Cyclohexane	0.000	0.0000	0.0000	0.0000
Heptanes	0.628	0.0011	0.0011	0.0046
Methylcyclohexane	0.000	0.0000	0.0000	0.0000
Toluene (TAP)	0.043	0.0001	0.0001	0.0003
2,2,4-Trimethylpentane (TAP)	0.165	0.0003	0.0003	0.0012
Octanes	0.009	0.0000	0.0000	0.0001
Ethylbenzene (TAP)	0.000	0.0000	0.0000	0.0000
Xylenes (TAP)	0.001	0.0000	0.0000	0.0000
Nonanes	0.018	0.0000	0.0000	0.0001
Decanes Plus	0.002	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:		**0.03**	**0.03**	**0.12**
TOTAL Non-VOC & Non-TAP HC:		0.12	0.12	0.53
TOTAL EMISSIONS:		1.16	1.16	5.09

Total of Average Hourly VOC emissions estimated for this source:	**3.69 Lbs/Hr**
Total of Maximum Hourly VOC emissions estimated for this source:	**3.69 Lbs/Hr**
Total of Maximum Annual VOC emissions estimated for this source:	**16.14 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	1898	1898	0.9096	0.9096
Purge Gas Feed	8760	150	150	0.1648	0.1648
Flare Gas Feed	8760	15000	15000	16.4787	16.4787
Pilot Gas Feed	8760	150	150	0.1648	0.1648
Totals:		***17,198***	***17,198***	***17.72***	***17.72***

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	0.19	0.19	0.83
Soot (expressed as $PM_{2.5}$)	0.000011	0.19	0.19	0.83
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	0.1380	2.45	2.45	10.71
CO	0.2755	4.88	4.88	21.38

Emission Calculations

POINT SOURCE I.D. NUMBER: ***17-05-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:	***100***
Basis of Emission Estimates:	***Conservative Estimate Provided by Operator & Representative Analysis***

Blowdown Gas Volume (SCF/Yr)	=	Volume per Blowdown * # of Blowdowns	=	**2320000.00**
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 * # of Blowdowns / 2000	=	**129.39**

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	0.4536
Carbon Dioxide (excluded from VOC total)	95.3440	2467.3327	2467.3327	123.3666
Methane (excluded from VOC total)	2.1744	56.2688	56.2688	2.8134
Ethane (excluded from VOC total)	0.5467	14.1480	14.1480	0.7074
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	0.5935	15.3587	15.3587	0.7679
Iso-Butane	0.1510	3.9067	3.9067	0.1953
N-Butane	0.3706	9.5892	9.5892	0.4795
Iso-Pentane	0.1874	4.8495	4.8495	0.2425
N-Pentane	0.1533	3.9678	3.9678	0.1984
Iso-Hexane	0.0780	2.0173	2.0173	0.1009
N-Hexane (TAP)	0.0181	0.4673	0.4673	0.0234
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.0037	0.0948	0.0948	0.0047
Cyclohexane	0.0000	0.0000	0.0000	0.0000
Heptanes	0.0098	0.2524	0.2524	0.0126
Methylcyclohexane	0.0000	0.0000	0.0000	0.0000
Toluene (TAP)	0.0037	0.0963	0.0963	0.0048

2,2,4-Trimethylpentane (TAP)	0.0043	0.1118	0.1118	0.0056
Octanes Plus	0.0098	0.2538	0.2538	0.0127
Ethylbenzene (TAP)	0.0002	0.0054	0.0054	0.0003
Xylenes (TAP)	0.0011	0.0280	0.0280	0.0014
Total Weight Percent:	100.0000			
Total TAP Emissions		0.80	0.80	0.04
Total VOC Emissions		**41.00**	**41.00**	**2.05**
Total Non VOC & Non TAP-HC		70.42	70.42	3.52
Total Emissions		2587.82	2587.82	129.39

VOC Emission Total (TPY)	=	Compressor Blowdowns	=	**2.05**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***19-05-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:	***100***
Basis of Emission Estimates:	***Conservative Estimate Provided by Operator & Representative Analysis***

Blowdown Gas Volume (SCF/Yr)	=	Volume per Blowdown * # of Blowdowns	=	**2320000.00**
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 * # of Blowdowns / 2000	=	**129.39**

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	0.4536
Carbon Dioxide (excluded from VOC total)	95.3440	2467.3327	2467.3327	123.3666
Methane (excluded from VOC total)	2.1744	56.2688	56.2688	2.8134
Ethane (excluded from VOC total)	0.5467	14.1480	14.1480	0.7074
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	0.5935	15.3587	15.3587	0.7679
Iso-Butane	0.1510	3.9067	3.9067	0.1953
N-Butane	0.3706	9.5892	9.5892	0.4795
Iso-Pentane	0.1874	4.8495	4.8495	0.2425
N-Pentane	0.1533	3.9678	3.9678	0.1984
Iso-Hexane	0.0780	2.0173	2.0173	0.1009
N-Hexane (TAP)	0.0181	0.4673	0.4673	0.0234
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.0037	0.0948	0.0948	0.0047
Cyclohexane	0.0000	0.0000	0.0000	0.0000
Heptanes	0.0098	0.2524	0.2524	0.0126
Methylcyclohexane	0.0000	0.0000	0.0000	0.0000
Toluene (TAP)	0.0037	0.0963	0.0963	0.0048

2,2,4-Trimethylpentane (TAP)	0.0043	0.1118	0.1118	0.0056
Octanes Plus	0.0098	0.2538	0.2538	0.0127
Ethylbenzene (TAP)	0.0002	0.0054	0.0054	0.0003
Xylenes (TAP)	0.0011	0.0280	0.0280	0.0014
Total Weight Percent:	100.0000			
Total TAP Emissions		0.80	0.80	0.04
Total VOC Emissions		**41.00**	**41.00**	**2.05**
Total Non VOC & Non TAP-HC		70.42	70.42	3.52
Total Emissions		2587.82	2587.82	129.39

VOC Emission Total (TPY)	=	Compressor Blowdowns	=	**2.05**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***22-05-CST***

EMISSION SOURCE DESCRIPTION: ***215 BBL Corrosion Inhibitor Tank (T-134)***

DATA:

Emission Source:	***"Working" & "Standing" Losses***
Maximum Throughput: **(Gallons/Yr)**	***21,000***
Average VOC Working Losses - L_W (lb/yr):	***117.216***
Average VOC Standing Losses - L_S (lb/yr):	***862.264***
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	=	**0.11**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**0.49**

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 9,030 gallons and an annual throughput of 21,000 gallons were used in the emissions model in an effort to demonstrate a conservative potential emissions estimate.

Emission Calculations

POINT SOURCE I.D. NUMBER: ***22-15-LH-BS***

EMISSION SOURCE DESCRIPTION: ***5.0 MMBTU/Hr Line Heater-Burner Stack (H-103)***

DATA:

Emission Source:	***External Combustion Burner***
Hours of Operation:	***8760***
Maximum Burner Rating (MMBTU/Hr):	***5.0***
Fuel Gas Heat of Combustion (BTU/scf): *(based on an actual fuel gas analysis)*	***1121***
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 = ***5,575.38***

Max. Annual Fuel Consumption (MSCF/Yr): = hourly fuel consumption x hours = ***48,840.33***

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	0.0424	0.1856
Sulfur Dioxide	1.182	0.0066	0.0289
Nitrogen Oxides	100	0.5575	2.4420
Carbon Monoxide	84	0.4683	2.0513
Methane (excluded from VOC total)	2.3	0.0128	0.0562
VOC	5.5	0.0307	0.1343
TOC	11	0.0613	0.2686
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
Benzo(g,h,I)perylene (TAP)	0.0000012	0.0000	0.0000

POLLUTANT:	EMISSION FACTOR (LBS/10^6 SCF)	CALCULATED EMISSION RATES:	
		Hourly (lb/hr)	Annual (TPY)
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	0.0018
Hexane (TAP)	1.8000000	0.0100	0.0440
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	0.0001
Selenium (TAP)	0.0000240	0.0000	0.0000
Total TAPs		0.01	0.05
Total VOC-TAPs		0.01	0.05
Total Non VOC & Non TAP-HC		0.01	0.06
Total VOC		**0.03**	**0.13**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***23-15-HT-BS***

EMISSION SOURCE DESCRIPTION: ***3.8 MMBTU/Hr Heater Treater-Burner Stack (V-24B)***

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)*	***1121***
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 = ***4,237.29***

Max. Annual Fuel Consumption (MSCF/Yr): = hourly fuel consumption x hours = ***37,118.66***

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	0.0322	0.1411
Sulfur Dioxide	1.182	0.0050	0.0219
Nitrogen Oxides	100	0.4237	1.8559
Carbon Monoxide	84	0.3559	1.5590
Methane (excluded from VOC total)	2.3	0.0097	0.0427
VOC	5.5	0.0233	0.1021
TOC	11	0.0466	0.2042
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
Benzo(g,h,I)perylene (TAP)	0.0000012	0.0000	0.0000

POLLUTANT:	EMISSION FACTOR ($LBS/10^6$ SCF)	CALCULATED EMISSION RATES:	
		Hourly (lb/hr)	Annual (TPY)
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	0.0076	0.0334
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	0.03
Total Non VOC & Non TAP-HC		0.01	0.04
Total VOC		**0.02**	**0.10**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***24-15-LP-RG***

EMISSION SOURCE DESCRIPTION: ***Low Pressure Relief Gas (AA-001)***

DATA:

Emission Source:	***Low Pressure Relief Gas***
Gas Specific Gravity: ***(based on an actual gas analysis)***	***1.5644***
Maximum Annual Vent Rate (MSCF):	***4000***
Basis of Emission Estimates:	***Actual Gas Analysis***

Avg. Hourly Hydocarbon Emissions (lb/hr)	=	Gas Gravity * Density of Air * Hourly Upset Gas Rate	=	**54.58**
Max. Hourly Hydrocarbon Emissions (lb/hr)	=	Gas Gravity * Density of Air * Hourly Upset Gas Rate	=	**54.58**
Annual Hydrocarbon Emissions (TPY)	=	Hourly * 8760/2000	=	**239.06**

SPECIATION FACTORS:

Speciation factors of the low pressure relief gas is based on an actual gas analysis; refer to Southern Petroleum Laboratories Report No.: 13110170-004A 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)	0.000	0.0000	0.0000	0.0000
Carbon Dioxide (excluded from VOC total)	82.386	44.9623	44.9623	196.9513
Methane (excluded from VOC total)	0.702	0.3828	0.3828	1.6770
Ethane (excluded from VOC total)	1.751	0.9556	0.9556	4.1859
Hydrogen Sulfide (excluded from VOC total)	0.000	0.0000	0.0000	0.0000
Propane	3.546	1.9352	1.9352	8.4771
Iso-Butane	1.426	0.7782	0.7782	3.4090
N-Butane	3.744	2.0433	2.0433	8.9504
Iso-Pentane	2.062	1.1253	1.1253	4.9294
N-Pentane	1.702	0.9289	0.9289	4.0688
Iso-Hexane	1.028	0.5610	0.5610	2.4575
N-Hexane (TAP)	0.000	0.0000	0.0000	0.0000
Methylcyclopentane	0.000	0.0000	0.0000	0.0000
Benzene (TAP)	0.175	0.0955	0.0955	0.4184
Cyclohexane	0.000	0.0000	0.0000	0.0000
Heptanes	0.732	0.3995	0.3995	1.7499
Methylcyclohexane	0.000	0.0000	0.0000	0.0000
Toluene (TAP)	0.089	0.0486	0.0486	0.2128
2,2,4-Trimethylpentane (TAP)	0.000	0.0000	0.0000	0.0000

Octanes	0.293	0.1599	0.1599	0.7004
Ethylbenzene (TAP)	0.006	0.0033	0.0033	0.0143
Xylenes (TAP)	0.036	0.0196	0.0196	0.0861
Nonanes	0.047	0.0257	0.0257	0.1124
Decanes Plus	0.276	0.1506	0.1506	0.6598
Total Weight Percent:	100.000			
Total TAP Emissions		0.17	0.17	0.73
Total VOC Emissions		**8.27**	**8.27**	**36.25**
Total Non VOC & Non TAP-HC		1.34	1.34	5.86
Total Emissions		54.58	54.58	239.06

VOC Emission Total (TPY)	=	Low Pressure Relief Gas	=	**36.25**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***25-15-CST***

EMISSION SOURCE DESCRIPTION: ***750 Gallon Paraffin Inhibitor Tank***

DATA:

Emission Source:	***"Working" & "Standing" Losses***
Maximum Throughput: **(Gallons/Yr)**	***10,000***
Average VOC Working Losses - L_W (lb/yr):	***55.495***
Average VOC Standing Losses - L_S (lb/yr):	***115.869***
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	=	**0.02**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**0.09**

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 750 gallons and an annual throughput of approximately 10,000 gallons/yr were used in the emissions model in an effort to demonstrate a conservative potential emissions estimate.

Emission Calculations

POINT SOURCE I.D. NUMBER: ***26-17-GST***

EMISSION SOURCE DESCRIPTION: ***790 Gallon Gasoline Storage Tank***

DATA:

Emission Source:	***"Working" & "Standing" Losses***
Maximum Gasoline Throughput: (Gallons/Yr)	***7,900***
Average VOC Working Losses - L_W (lb/yr):	***102.782***
Average VOC Standing Losses - L_S (lb/yr):	***725.670***
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**
Max. Hourly Uncontrolled THC Losses (lb/hr)	=	(Ls + (Lw * QMax ÷ Qavg))/8760	=	**0.09**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**0.41**

SPECIATION FACTORS:

Speciation factors were taken from "Air Emissions Species Manual - Volume I: Volatile Organic Compound Species Profiles", 2nd edition; Report No.: EPA-450/2-90-001a; 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	0.0052
N-Butane	22.95	0.0217	0.0217	0.0951
Iso-Butane	9.83	0.0093	0.0093	0.0407
N-Pentane	8.56	0.0081	0.0081	0.0355
N-Hexane (TAP)	1.84	0.0017	0.0017	0.0076
Heptane	0.32	0.0003	0.0003	0.0013
Octane	0.02	0.0000	0.0000	0.0001
Cyclopentane	0.72	0.0007	0.0007	0.0030
Cyclohexanes	1.65	0.0016	0.0016	0.0068
2,2,4-Trimethylpentane (TAP)	0.49	0.0005	0.0005	0.0020
Methylcyclohexanes	0.24	0.0002	0.0002	0.0010
Methylcyclopentane	1.66	0.0016	0.0016	0.0069
Cyclopentene	0.25	0.0002	0.0002	0.0010
Benzene (TAP)	0.77	0.0007	0.0007	0.0032
Toluene (TAP)	0.66	0.0006	0.0006	0.0028
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	0.0008
Other Hexanes	8.35	0.0079	0.0079	0.0346
Other Heptanes	2.53	0.0024	0.0024	0.0105
Other Octanes	0.33	0.0003	0.0003	0.0014
Other Butenes	3.30	0.0031	0.0031	0.0137
Other Pentanes	33.58	0.0318	0.0318	0.1391
Other VOCs (Non-TAP)	0.37	0.0003	0.0003	0.0015
Total Weight Percent:	100.00			
Total TAP Emissions		0.00	0.00	0.02
Total VOC Emissions		**0.09**	**0.09**	**0.41**
Total Non VOC & Non TAP-HC		0.00	0.00	0.00
Total Hydrocarbon Emissions		0.09	0.09	0.41

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
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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

Broussard Laboratory
101 Ibex Lane
Broussard, LA 70518
Phone 337-210-8044

Certificate of Analysis

Number: 2030-22100272-001A

Nov. 02, 2022

Chris Toler
Denbury Resources
5320 Legacy Drive
Plano, TX 75024

Field:	Olive	Sampled By:	CT-Denbury
Station Name:	Olive Fuel	Sample Of:	Gas Spot
Station Number:		Sample Date:	10/07/2022 07:15
Sample Point:	Meter Tube	Sample Conditions:	216 psig, @ 71 °F
Analyzed:	10/27/2022 13:26:30 by TAM	Method:	GPA 2286
		Cylinder No:	2030-239

Analytical Data

Components	Mol. %	Wt. %	GPM at 15.025 psia		
Nitrogen	1.815	2.409		GPM TOTAL C2+	4.159
Carbon Dioxide	4.653	9.701		GPM TOTAL C3+	1.982
Methane	79.284	60.257		GPM TOTAL iC5+	0.462
Ethane	7.956	11.334	2.177		
Propane	3.352	7.002	0.945		
Iso-butane	0.665	1.831	0.223		
n-Butane	1.089	2.999	0.352		
Iso-pentane	0.406	1.388	0.152		
n-Pentane	0.292	0.998	0.108		
Hexanes Plus	0.488	2.081	0.202		
	100.000	100.000	4.159		

Physical Properties	Total	C6+
Relative Density Real Gas	0.7309	3.0931
Calculated Molecular Weight	21.11	89.58
Compressibility Factor	0.9967	
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 15.025 psia & 60°F		
Real Gas Dry BTU	1164	4953
Water Sat. Gas Base BTU	1144	4868
Calculated Gross BTU per ft³ @ 14.73 psia & 60°F		
Real Gas Dry BTU	1141	4855
Water Sat. Gas Base BTU	1121	4771

Patti L. Pecoro

Hydrocarbon Laboratory Manager

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

Broussard Laboratory
101 Ibex Lane
Broussard, LA 70518
Phone 337-210-8044

Certificate of Analysis

Number: 2030-22100272-001A

Nov. 02, 2022

Chris Toler
Denbury Resources
5320 Legacy Drive
Plano, TX 75024

Field:	Olive	Sampled By:	CT-Denbury
Station Name:	Olive Fuel	Sample Of:	Gas Spot
Station Number:		Sample Date:	10/07/2022 07:15
Sample Point:	Meter Tube	Sample Conditions:	216 psig, @ 71 °F
Analyzed:	10/27/2022 13:26:30 by TAM	Method:	GPA 2286
		Cylinder No:	2030-239

Analytical Data

Components	Mol. %	Wt. %	GPM at 15.025 psia		
Nitrogen	1.815	2.409		GPM TOTAL C2+	4.159
Carbon Dioxide	4.653	9.701		GPM TOTAL C3+	1.982
Methane	79.284	60.257		GPM TOTAL iC5+	0.462
Ethane	7.956	11.334	2.177		
Propane	3.352	7.002	0.945		
Iso-Butane	0.665	1.831	0.223		
n-Butane	1.089	2.999	0.352		
Iso-Pentane	0.406	1.388	0.152		
n-Pentane	0.292	0.998	0.108		
Hexanes	0.271	1.109	0.115		
Heptanes Plus	0.217	0.972	0.087		
	100.000	100.000	4.159		

Physical Properties	**Total**	**C7+**
Relative Density Real Gas	0.7309	3.2405
Calculated Molecular Weight	21.11	93.85
Compressibility Factor	0.9967	
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 15.025 psia & 60°F		
Real Gas Dry BTU	1164	5073
Water Sat. Gas Base BTU	1144	4987
Calculated Gross BTU per ft³ @ 14.73 psia & 60°F		
Real Gas Dry BTU	1141	4974
Water Sat. Gas Base BTU	1121	4887

Patti L. Pecoro

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: 2030-22100272-001A

Broussard Laboratory
101 Ibex Lane
Broussard, LA 70518
Phone 337-210-8044

Chris Toler
Denbury Resources
5320 Legacy Drive
Plano, TX 75024

Nov. 02, 2022

Field:	Olive	Sampled By:	CT-Denbury
Station Name:	Olive Fuel	Sample Of:	Gas Spot
Station Number:		Sample Date:	10/07/2022 07:15
Sample Point:	Meter Tube	Sample Conditions:	216 psig, @ 71 °F
Analyzed:	10/27/2022 13:26:30 by TAM	Method:	GPA 2286
		Cylinder No:	2030-239

Analytical Data

Components	Mol. %	Wt. %	GPM at 15.025 psia		
Nitrogen	1.815	2.409		GPM TOTAL C2+	4.159
Carbon Dioxide	4.653	9.701			
Methane	79.284	60.257			
Ethane	7.956	11.334	2.177		
Propane	3.352	7.002	0.945		
Iso-Butane	0.665	1.831	0.223		
n-Butane	1.089	2.999	0.352		
Iso-Pentane	0.406	1.388	0.152		
n-Pentane	0.292	0.998	0.108		
i-Hexanes	0.189	0.775	0.080		
n-Hexane	0.082	0.334	0.035		
Benzene	0.029	0.106	0.008		
Cyclohexane	NIL	NIL	NIL		
i-Heptanes	0.125	0.551	0.051		
n-Heptane	0.016	0.077	0.008		
Toluene	0.010	0.043	0.003		
i-Octanes	0.034	0.165	0.015		
n-Octane	0.002	0.009	0.001		
Ethylbenzene	NIL	NIL	NIL		
Xylenes	NIL	0.001	NIL		
i-Nonanes	0.001	0.017	0.001		
n-Nonane	NIL	0.001	NIL		
Decane Plus	NIL	0.002	NIL		
	100.000	100.000	4.159		

Calculated Physical Properties	**Total**	**C10+**
Calculated Molecular Weight	21.11	NIL
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 15.025 psia & 60°F		
Real Gas Dry BTU	1163.9	NIL
Water Sat. Gas Base BTU	1144.0	NIL
Relative Density Real Gas	0.7309	NIL
Compressibility Factor	0.9967	

Patti L. Perro

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.

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HOUSTON LABORATORIES
8020 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

CERTIFICATE OF ANALYSIS

Certificate of Analysis Number: **13110657-001A**

FOR: Danbury Resources
Danbury Resources
5320 Legacy Drive

Plano, TX 75024

CUSTOMER:	Danbury Resources	**TYPE:**	SpotLiquid
FIELD :	Olive	**REPORT:**	Flash Report
LOCATION :	EOR Last Vessel to Water Tank	**CYLINDER:**	6337
SAMPLE POINT:		**PRESSURE:**	199
REPORT DATE:	12/4/2013	**TEMPERATURE:**	66
SAMPLE DATE:	11/5/2013		
SAMPLED BY:	JB		

Comments: Pressurized water sample physically flashed and composition calculated.

Analytical Data

Parameters	Results	Units	Lab Tech.	Date Analyzed
Flash Factor	20.57	Ft^3 / bbl	JS	12/4/2013
Flash Factor (Air Free)	20.40	Ft^3 / bbl	JS	12/4/2013

Hydrocarbon Laboratory Manager

HOUSTON LABORATORIES
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HOUSTON, TEXAS 77054
PHONE (713) 660 0901

Certificate of Analysis Number: 13110657-001A

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

CUSTOMER:	Denbury Resources	**TYPE:**	SpotLiquid
LOCATION :	EOR Last Vessel to Water Tank	**REPORT:**	C10+ (GPA Method 2286)
SAMPLE POINT:		**CYLINDER:**	5337
REPORT DATE:	12/6/2013	**PRESSURE:**	199
SAMPLE DATE:	11/5/2013	**TEMPERATURE:**	68
SAMPLED BY:	JB		

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

COMPONENT	MOL %	WEIGHT %	GPM's
HELIUM	NIL	NIL	
HYDROGEN	NIL	NIL	
OXYGEN/ARGON	NIL	NIL	
NITROGEN	0.050	0.032	
METHANE	0.474	0.173	
CARBON DIOXIDE	99.313	99.560	
ETHANE	0.050	0.034	0.014
PROPANE	0.029	0.030	0.008
I-BUTANE	0.005	0.007	0.002
N-BUTANE	0.014	0.018	0.004
I-PENTANE	NIL	NIL	NIL
N-PENTANE	NIL	NIL	NIL
I-HEXANES	0.007	0.010	0.002
N-HEXANE	0.003	0.006	0.001
BENZENE	0.016	0.033	0.004
CYCLOHEXANE	0.003	0.005	0.001
I-HEPTANES	0.007	0.014	0.003
N-HEPTANE	0.003	0.006	0.001
TOLUENE	0.006	0.011	0.002
I-OCTANES	0.009	0.022	0.004
N-OCTANE	0.002	0.005	0.001
*E-BENZENE	NIL	0.001	NIL
*m,o,&p-XYLENE	0.005	0.010	0.001
I-NONANES	0.001	0.008	0.002
N-NONANE	0.001	0.003	0.001
I-DECANES	0.002	0.011	0.002
N-DECANE	0.001	0.002	NIL
I-UNDECANES +	NIL	0.001	0.001
TOTALS	100.000	100.000	0.054

CALCULATED VALUES	TOTAL	C10+
Molecular Weight	43.901	129.979
Relative Density as a Vapor	1.5234	4.7926
Compressibility Factor	0.9943	N/A
HvID/Z (Btu/Ft.^{3}), Dry Basis at 15.025 Psia, 60°F	10.7	7490 *
HvID/Z (Btu/Ft.^{3}), Saturated at Base at 15.025 Psia, 60°F	11.4	7527 *

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

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HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis Number: 13110667-001A

FOR: Denbury Resources
Denbury 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:	5337
REPORT DATE:	12/6/2013	PRESSURE:	198
SAMPLE DATE:	11/5/2013	TEMPERATURE:	68
SAMPLED BY:	JB		
MEMO:	Pressurized water sample physically flashed and composition calculated on an air free basis.		

COMPONENT	MOL %	WEIGHT %	GPM's
HELIUM	NIL	NIL	
HYDROGEN	NIL	NIL	
OXYGEN/ARGON	NIL	NIL	
NITROGEN	0.050	0.032	
METHANE	0.474	0.173	
CARBON DIOXIDE	99.313	99.560	
ETHANE	0.050	0.034	0.014
PROPANE	0.029	0.030	0.008
I-BUTANE	0.005	0.007	0.002
N-BUTANE	0.014	0.018	0.004
I-PENTANE	NIL	NIL	NIL
N-PENTANE	NIL	NIL	NIL
HEXANES PLUS	0.065	0.146	0.027
TOTALS	100.000	100.000	0.054

CALCULATED VALUES	TOTAL	C6+
Molecular Weight	43.901	97.371
Relative Density as a Vapor	1.5234	3.3919
Compressibility Factor	0.9943	N/A
HvID/Z (Btu/Ft.^{3}), Dry Basis at 15.025 Psia, 60°F	10.7	5121 *
HvID/Z (Btu/Ft.^{3}), Saturated at Base at 15.025 Psia, 60°F	11.4	5146 *

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

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HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis Number: 3610657-001A

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:	11/5/2013
SAMPLED BY:	JB
MEMO:	Pressurized water sample physically flashed and composition calculated on an air free basis.

TYPE: SpotLiquid
REPORT: C10+ (GPA Method 2186)
CYLINDER: 5337
PRESSURE: 199
TEMPERATURE: 68

COMPONENT	MOL %	WEIGHT %	LV %
HELIUM	NIL	NIL	
HYDROGEN	NIL	NIL	
OXYGEN/ARGON	NIL	NIL	
NITROGEN	0.050	0.032	
METHANE	0.474	0.173	
CARBON DIOXIDE	99.313	99.660	
ETHANE	0.050	0.034	0.014
PROPANE	0.029	0.030	0.008
I-BUTANE	0.005	0.007	0.002
N-BUTANE	0.014	0.018	0.004
I-PENTANE	NIL	NIL	NIL
N-PENTANE	NIL	NIL	NIL
HEXANES	0.010	0.016	0.003
HEPTANES PLUS	0.056	0.130	0.024
TOTALS	100.000	100.000	0.054

CALCULATED VALUES	TOTAL	C7+
Molecular Weight	43.901	99.453
Relative Density as a Vapor	1.5234	3.4640
Compressibility Factor	0.9943	N/A
HvID/Z (Btu/Ft.^{3}), Dry Basis at 15.025 Psia, 60°F	10.7	5192 *
HvID/Z (Btu/Ft.^{3}), Saturated at Base at 15.025 Psia, 60°F	11.4	5218 *

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

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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 1.0330 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

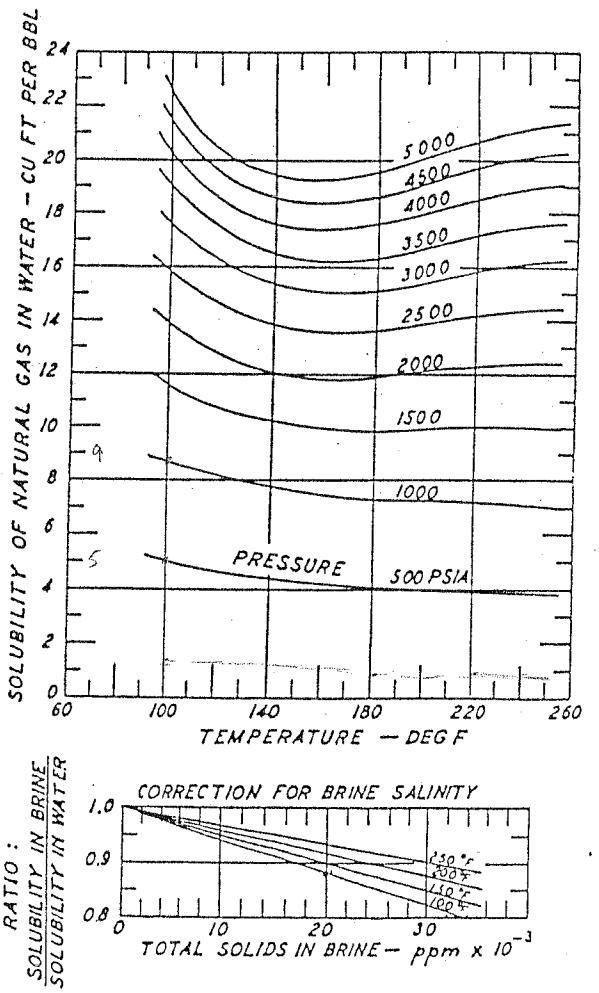
Formation Volumes of Pure Water and Mixtures of Natural Gas and Water

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	**9a-05-OST-CV & 9b-05-OST-CV**
Tank Description	**5000 BBL Oil Storage Tank**
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)	**0.71**
Roof Paint Solar Absorptance (R_A)	**0.71**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.4021**

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)	**1,095,000.00**
Annual Turnovers, N	**227.41**
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	**Baton Rouge, LA**
Site Elevation (ft)	**100**
Atmospheric Pressure (P_A psia)	**14.643**
Table 7.1-2 Liquid	**crude oil**
*RVP**	**6.80**
*API gravity**	**44.1**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**44.1**
API gravity at 100F	**47.5**
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)	61.60	65.20	71.40	78.00	85.00	89.40	90.90	91.30	87.60	79.70	70.10	63.10	77.80
hourly average minimum ambient temperature (T_{AN} °F)	42.20	44.50	50.50	56.90	65.50	71.40	73.90	73.20	68.60	58.10	48.20	42.80	58.00
daily total solar insolation factor (I btu/ft^2 day)	822	1075	1375	1736	1894	1914	1896	1813	1553	1291	983	784	1428
daily average ambient temperature (T_{AA} °F)	51.90	54.85	60.95	67.45	75.25	80.40	82.40	82.25	78.10	68.90	59.15	52.95	67.90
liquid bulk temperature (T_B °F)	53.65	57.14	63.88	71.15	79.28	84.48	86.44	86.11	81.41	71.65	61.24	54.62	70.94
average vapor temperature (T_V °F)	57.52	62.20	70.35	79.32	88.20	93.48	95.36	94.64	88.72	77.72	65.87	58.31	77.66
daily ambient temperature range (ΔT_A °R)	19.40	20.70	20.90	21.10	19.50	18.00	17.00	18.10	19.00	21.60	21.90	20.30	19.80
daily vapor temperature range (ΔT_V °R)	25.25	29.76	34.16	39.42	40.54	39.78	38.82	38.41	35.35	33.45	29.29	25.34	34.14
daily average liquid surface temperature (T_{LA} °F)	55.58	59.67	67.11	75.23	83.74	88.98	90.90	90.38	85.06	74.69	63.56	56.46	74.30
daily maximum liquid surface temperature (T_{LX} °F)	61.90	67.11	75.65	85.09	93.88	98.92	100.61	99.98	93.90	83.05	70.88	62.80	82.84
daily minimum liquid surface temperature (T_{LN} °F)	49.27	52.23	58.58	65.38	73.60	79.04	81.19	80.77	76.22	66.32	56.23	50.13	65.77
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	4.050	4.366	4.993	5.755	6.648	7.250	7.480	7.417	6.796	5.701	4.685	4.116	5.663
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	4.547	4.992	5.797	6.799	7.849	8.507	8.735	8.650	7.852	6.572	5.336	4.622	6.548
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	3.597	3.804	4.280	4.841	5.595	6.142	6.370	6.325	5.854	4.923	4.099	3.656	4.875
daily vapor pressure range (ΔP_V)	0.9503	1.1888	1.5171	1.9582	2.2542	2.3655	2.3652	2.3249	1.9985	1.6486	1.2369	0.9661	1.6737
vapor space expansion factor (K_E)	0.1387	0.1730	0.2220	0.2940	0.3566	0.3925	0.4007	0.3916	0.3196	0.2470	0.1802	0.1409	0.2503
vapor molecular weight (M_V lb/lbmole)	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
monthly hours with avg = total annual	744	672	744	720	744	720	744	744	720	744	720	744	8,760
throughputs (ft^3/month) and avg = total annual	522,102	471,576	522,102	505,260	522,102	505,260	522,102	522,102	505,260	522,102	505,260	522,102	6,147,330
monthly turnovers (N/month) with avg = total annual	19.31	17.45	19.31	18.69	19.31	18.69	19.31	19.31	18.69	19.31	18.69	19.31	227.41
vented vapor saturation factor (K_S)	0.2645	0.2502	0.2259	0.2020	0.1797	0.1673	0.1630	0.1642	0.1765	0.2035	0.2372	0.2614	0.2046
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)	0.0365	0.0390	0.0439	0.0497	0.0565	0.0611	0.0628	0.0623	0.0577	0.0494	0.0415	0.0370	0.0491
standing storage losses (L_S lb/month & avg is lb/yr)	877.96	847.29	1056.24	1158.54	1360.56	1422.10	1511.12	1500.28	1344.69	1189.48	967.34	891.03	14126.61
working losses (L_W lb/month & avg is lb/yr)	14286.58	13787.53	17187.62	18852.38	22139.73	23141.09	24589.81	24413.29	21881.48	19355.77	15741.01	14499.27	229875.55
total losses (L_T lb/month & avg is lb/yr)	15164.53	14634.82	18243.85	20010.92	23500.29	24563.18	26100.94	25913.57	23226.17	20545.24	16708.34	15390.30	244002.15
max hourly Q in bbl/hour	701.75	701.75	701.75	701.75	701.75	701.75	701.75	701.75	701.75	701.75	701.75	701.75	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	19.202	20.517	23.102	26.184	29.758	32.140	33.051	32.814	30.391	26.016	21.863	19.488	
breathing/standing loss (L_S lb/hr)	1.180	1.261	1.420	1.866	2.288	2.532	2.590	2.531	2.057	1.599	1.344	1.198	
max hourly total loss (L_T lb/hr)	20.382	21.778	24.521	28.050	32.046	34.673	35.641	35.345	32.448	27.615	23.206	20.686	

L_S sum months	L_W sum months	L_T sum months
14126.61	229875.55	244002.15

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	**1.588**	**2.590**	**13,913.712**
Working Loss L_W	**25.846**	**33.051**	**226,411.217**
Total Loss L_T	**27.434**	**35.641**	**240,324.929**

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	

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Flash Liberation of Hydrocarbon Liquid Study

Client:	Denbury Resources	Sample Lab ID:	23120294-001A
Facility:	Olive EOR	Facility Well:	V-24A
Equipment:	Not Indicated	Sample Source:	Treater
Unique Number:	Not Indicated	Analyst:	JMC
Date Sampled:	12/12/23	Date Analyzed:	12/28/23
State:	MS	Site Notes:	
County:	Not Indicated		

Flash Liberation of Hydrocarbon Liquid Conditions

	Pressure (psig)	Temperature (°F)
Separator Hydrocarbon Liquid	43.0	75.0
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	5.75	SCF flashed vapor/bbl stock tank oil
Gas Oil Ratio	0.475	lb flashed vapor/bbl stock tank oil
Gas Specific Gravity	1.079	Air = 1.000
Separator Volume Factor	1.022	Separator Volume/Stock tank Volume

Stock Tank Fluid Properties

	Result	Units/Description
Shrinkage Recovery Factor	0.9785	Fraction of first stage separator liquid
Oil API Gravity at 60 °F	44.08	
Specific Gravity at 60 °F	0.8059	ASTM D7777, Measured
Dry Vapor Pressure, psi	5.14	Absolute Pressure at 100°F by D5191

Cylinder Pressure Check

	Pressure (psi)	Temperature (°F)
Sample Conditions	43.0	75.0
Test Sample	32.3	74.7

Quality Control Summary

Duplicate Results		Acceptable Range
Gas Oil Ratio (% difference)	0.2	<5%
Separator Volume Factor (% difference)	0.2	<5%
Shrinkage Recovery Factor (% difference)	0.2	<5%
Cylinder Type	Piston	
Cylinder Size (cc)	500	
Cylinder Number	3785	
Sample Collection Rate (mL/min)	47	<50 mL/min

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Gas Evolved from Flashed Hydrocarbon Liquid

Analyst:	JMC	**Analysis Date**	12/28/2023
Client:	Denbury Resources	**Date Sampled:**	12/28/2023
Facility:	Olive EOR	**Purpose:**	Flash Gas Analysis
Equipment:	Not Indicated	**Sample Source:**	Treater
Unique #:	Not Indicated	**Pressure:**	Ambient
Sample Temperature:	70°F	**Type Sample:**	Spot
Sampled by:	JMC	**County:**	Not Indicated

COMPONENT	MOLE %	GPM
Nitrogen	2.641	
Carbon Dioxide	22.431	
Methane	55.117	
Ethane	3.081	0.829
Propane	4.178	1.158
Isobutane	1.779	0.586
n-Butane	3.543	1.124
Isopentane	1.693	0.623
n-Pentane	2.052	0.748
Hexanes	2.110	0.778
Heptanes Plus	1.375	0.617
Totals	100.000	6.463

Specific Gravity	1.079		
Compressibility (Z)	0.9938		
Molecular Weight	31.08		
Saturated Ideal BTUs	1188.4	Saturated Real BTUs	1195.8
Dry Ideal BTUs	1209.5	Dry Real BTUs	1217.0
Base Conditions:	14.73 psi, 60 °F		

Gas Evolved from Flashed Hydrocarbon Liquid
Extended Analysis Report

COMPONENT	MOLE %	BTU	GPM	WT %
Nitrogen	2.641			2.380
Carbon Dioxide	22.431			31.760
Methane	55.116	557.970		28.448
Ethane	3.081	54.650	0.829	2.981
Propane	4.178	105.366	1.158	5.927
Isobutane	1.779	57.985	0.586	3.327
n-Butane	3.543	115.850	1.124	6.625
Isopentane	1.693	67.892	0.623	3.930
n-Pentane	2.052	82.449	0.748	4.763
2,2-Dimethylbutane	0.056	2.658	0.024	0.155
Cyclopentane	0.081	3.049	0.024	0.182
2,3-Dimethylbutane	0.096	3.606	0.029	0.216
2-Methylpentane	0.645	24.315	0.192	1.455
3-Methylpentane	0.336	15.998	0.138	0.932
n-Hexane	0.897	42.759	0.371	2.487
Methylcyclopentane	0.310	17.095	0.144	0.999
Benzene	0.027	1.012	0.008	0.068
Cyclohexane	0.212	9.523	0.073	0.574
2-Methylhexane	0.012	0.688	0.006	0.040
3-Methylhexane	0.009	0.475	0.004	0.028
2,2,4-Trimethylpentane	0.000	0.000	0.000	0.000
Other Heptanes	0.020	1.078	0.009	0.063
n-Heptane	0.425	23.463	0.197	1.372
Methylcyclohexane	0.103	5.384	0.042	0.325
Toluene	0.014	0.627	0.005	0.042
Other Octanes	0.117	7.328	0.060	0.430
n-Octane	0.063	3.946	0.033	0.232
Ethylbenzene	0.002	0.104	0.001	0.007
m,p-Xylene	0.006	0.310	0.002	0.020
o-Xylene	0.002	0.104	0.001	0.007
Other Nonanes	0.026	1.823	0.015	0.107
n-Nonane	0.014	0.982	0.008	0.058
Other Decanes	0.009	0.706	0.006	0.042
n-Decane	0.003	0.202	0.002	0.012
Undecanes+	0.001	0.000	0.001	0.006
Totals	100.000	1209.4	6.463	100.000

Specific Gravity	1.079		
Compressibility (Z)	0.994		
Molecular Weight	31.081		
Saturated Ideal BTUs	1188.4	Saturated Real BTUs	1195.8
Dry Ideal BTUs	1209.5	Dry Real BTUs	1217.0

Base Conditions:	14.73 psi, 60 °F	
HAP Weight Fraction		**0.0263**
VOC Weight Fraction		**0.3421**
Higher Heating Value (BTU/ft^3)		**1209.5**
Lower Heating Value (BTU/ft^3)		**1104.2**

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

Tank ID	**9c-05-OST-CV**
Tank Description	**1000 BBL Bad Oil Storage Tank**
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)	**0.71**
Roof Paint Solar Absorptance (R_A)	**0.71**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.2240**

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)	**2,920.00**
Annual Turnovers, N	**2.99**
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	**Baton Rouge, LA**
Site Elevation (ft)	**100**
Atmospheric Pressure (P_A psia)	**14.643**
Table 7.1-2 Liquid	**crude oil**
*RVP**	**6.80**
*API gravity**	**44.1**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**44.1**
API gravity at 100F	**47.5**
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)	61.60	65.20	71.40	78.00	85.00	89.40	90.90	91.30	87.60	79.70	70.10	63.10	77.80
hourly average minimum ambient temperature (T_{AN} °F)	42.20	44.50	50.50	56.90	65.50	71.40	73.90	73.20	68.60	58.10	48.20	42.80	58.00
daily total solar insolation factor (I btu/ft^2 day)	822	1075	1375	1736	1894	1914	1896	1813	1553	1291	983	784	1428
daily average ambient temperature (T_{AA} °F)	51.90	54.85	60.95	67.45	75.25	80.40	82.40	82.25	78.10	68.90	59.15	52.95	67.90
liquid bulk temperature (T_B °F)	53.65	57.14	63.88	71.15	79.28	84.48	86.44	86.11	81.41	71.65	61.24	54.62	70.94
average vapor temperature (T_V °F)	57.35	61.98	70.07	78.96	87.81	93.09	94.97	94.27	88.40	77.46	65.67	58.15	77.37
daily ambient temperature range (ΔT_A °R)	19.40	20.70	20.90	21.10	19.50	18.00	17.00	18.10	19.00	21.60	21.90	20.30	19.80
daily vapor temperature range (ΔT_V °R)	25.25	29.76	34.16	39.42	40.54	39.78	38.82	38.41	35.35	33.45	29.29	25.37	34.14
daily average liquid surface temperature (T_{LA} °F)	55.50	59.56	66.97	75.06	83.55	88.79	90.71	90.19	84.90	74.56	63.46	56.38	74.16
daily maximum liquid surface temperature (T_{LX} °F)	61.81	67.00	75.51	84.91	93.68	98.73	100.41	99.80	93.74	82.92	70.78	62.73	82.69
daily minimum liquid surface temperature (T_{LN} °F)	49.19	52.12	58.43	65.20	73.41	78.84	81.00	80.59	76.07	66.19	56.13	50.04	65.62
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	4.043	4.357	4.981	5.737	6.627	7.227	7.457	7.395	6.778	5.688	4.677	4.110	5.649
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	4.540	4.983	5.783	6.779	7.825	8.481	8.709	8.625	7.832	6.557	5.326	4.616	6.532
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	3.591	3.796	4.269	4.825	5.577	6.121	6.349	6.306	5.838	4.912	4.091	3.650	4.862
daily vapor pressure range (ΔP_V)	0.9492	1.1869	1.5141	1.9535	2.2485	2.3596	2.3595	2.3195	1.9944	1.6456	1.2352	0.9659	1.6704
vapor space expansion factor (K_E)	0.1386	0.1727	0.2216	0.2931	0.3551	0.3907	0.3989	0.3899	0.3185	0.2464	0.1799	0.1409	0.2497
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	1,392	1,258	1,392	1,347	1,392	1,347	1,392	1,392	1,347	1,392	1,347	1,392	16,393
monthly turnovers (N/month) with avg = total annual	0.25	0.23	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.99
vented vapor saturation factor (K_S)	0.3472	0.3304	0.3016	0.2726	0.2450	0.2293	0.2238	0.2253	0.2408	0.2743	0.3150	0.3435	0.2757
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)	0.0364	0.0389	0.0438	0.0496	0.0564	0.0609	0.0626	0.0622	0.0576	0.0493	0.0415	0.0370	0.0490
standing storage losses (L_S lb/month & avg is lb/yr)	247.71	238.97	297.79	326.49	383.37	400.73	425.83	422.82	379.08	335.41	272.87	251.41	3982.48
working losses (L_W lb/month & avg is lb/yr)	38.05	36.71	45.74	50.15	58.89	61.56	65.41	64.95	58.23	51.52	41.92	38.62	611.76
total losses (L_T lb/month & avg is lb/yr)	285.76	275.68	343.53	376.64	442.26	462.28	491.24	487.77	437.31	386.94	314.79	290.03	4594.23
max hourly Q in bbl/hour	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.051	0.055	0.061	0.070	0.079	0.085	0.088	0.087	0.081	0.069	0.058	0.052	
breathing/standing loss (L_S lb/hr)	0.333	0.356	0.400	0.526	0.651	0.724	0.742	0.725	0.587	0.451	0.379	0.338	
max hourly total loss (L_T lb/hr)	0.384	0.410	0.462	0.596	0.730	0.810	0.830	0.812	0.668	0.520	0.437	0.390	

L_S sum months	L_W sum months	L_T sum months
3982.48	611.76	4594.23

The monthly sums will be greater than the annual average since the monthly variables yield higher emissions

Emissions Summary:	**avg lbs/hr**	**max lbs/hr**	**lbs/yr**
Standing/Breathing Loss L_S	**0.448**	**0.742**	**3,922.695**
Working Loss L_W	**0.069**	**0.088**	**602.572**
Total Loss L_T	**0.517**	**0.830**	**4,525.267**

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	**9d-05-WST-CV & 9e-05-WST-CV**
Tank Description	**1500 BBL Produced Water Skimmer Tank**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**21.60**
Vertical Height/Horizontal Length (H_S ft)	**24.00**
Roof Height (H_R ft)	**0.68**
Max Liquid Height (H_{LX} ft)	**23.00**
Avg Liquid Height (H_L ft)	**11.50**
Breather Vent Pressure Setting (P_{BP} psig)	
Breather Vent Vacuum Setting (P_{BV} psig)	
actual tank pressure (P_I psig)	**0.0**
Shell Paint Solar Absorptance (S_A)	**0.71**
Roof Paint Solar Absorptance (R_A)	**0.71**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.2250**

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)	**1,461,460.00**
Annual Turnovers, N	**973.50**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**8,428.01**
vapor space outage (H_{VO} ft)	**12.725**
vapor space volume (V_V ft^3)	**4,662.89**

Major City for Meterological Data	**Baton Rouge, LA**
Site Elevation (ft)	**100**
Atmospheric Pressure (P_A psia)	**14.643**
Table 7.1-2 Liquid	
*RVP**	**6.80**
*API gravity**	**44.1**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**44.1**
API gravity at 100F	**47.5**
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	10.965	4929.295	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)	61.60	65.20	71.40	78.00	85.00	89.40	90.90	91.30	87.60	79.70	70.10	63.10	77.80
hourly average minimum ambient temperature (T_{AN} °F)	42.20	44.50	50.50	56.90	65.50	71.40	73.90	73.20	68.60	58.10	48.20	42.80	58.00
daily total solar insolation factor (I btu/ft^2 day)	822	1075	1375	1736	1894	1914	1896	1813	1553	1291	983	784	1428
daily average ambient temperature (T_{AA} °F)	51.90	54.85	60.95	67.45	75.25	80.40	82.40	82.25	78.10	68.90	59.15	52.95	67.90
liquid bulk temperature (T_B °F)	53.65	57.14	63.88	71.15	79.28	84.48	86.44	86.11	81.41	71.65	61.24	54.62	70.94
average vapor temperature (T_V °F)	56.98	61.50	69.45	78.19	86.96	92.24	94.13	93.46	87.71	76.88	65.23	57.80	76.73
daily ambient temperature range (ΔT_A °R)	19.40	20.70	20.90	21.10	19.50	18.00	17.00	18.10	19.00	21.60	21.90	20.30	19.80
daily vapor temperature range (ΔT_V °R)	25.35	29.76	34.16	39.42	40.54	39.78	38.82	38.41	35.35	33.45	29.29	25.64	34.14
daily average liquid surface temperature (T_{LA} °F)	55.32	59.32	66.67	74.67	83.12	88.36	90.28	89.79	84.56	74.27	63.24	56.21	73.84
daily maximum liquid surface temperature (T_{LX} °F)	61.66	66.76	75.21	84.52	93.26	98.30	99.99	99.39	93.39	82.63	70.56	62.62	82.37
daily minimum liquid surface temperature (T_{LN} °F)	48.98	51.88	58.13	64.81	72.99	78.41	80.58	80.18	75.72	65.90	55.91	49.80	65.30
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	0.220	0.254	0.328	0.430	0.567	0.670	0.712	0.701	0.594	0.425	0.292	0.227	0.419
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	0.276	0.329	0.438	0.593	0.780	0.910	0.957	0.940	0.784	0.558	0.375	0.285	0.554
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	0.175	0.194	0.244	0.308	0.407	0.487	0.523	0.516	0.446	0.320	0.225	0.180	0.313
daily vapor pressure range (ΔP_V)	0.1013	0.1351	0.1946	0.2853	0.3733	0.4228	0.4346	0.4242	0.3378	0.2385	0.1501	0.1054	0.2405
vapor space expansion factor (K_E)	0.0563	0.0667	0.0785	0.0938	0.1012	0.1028	0.1018	0.1003	0.0890	0.0794	0.0665	0.0570	0.0809
vapor molecular weight (M_V lb/lbmole)	18.60	18.56	18.50	18.44	18.39	18.36	18.35	18.35	18.38	18.44	18.53	18.59	18.44
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	696,832	629,397	696,832	674,354	696,832	674,354	696,832	696,832	674,354	696,832	674,354	696,832	8,204,636
monthly turnovers (N/month) with avg = total annual	82.68	74.68	82.68	80.01	82.68	80.01	82.68	82.68	80.01	82.68	80.01	82.68	973.50
vented vapor saturation factor (K_S)	0.8707	0.8537	0.8187	0.7750	0.7232	0.6888	0.6757	0.6791	0.7140	0.7773	0.8356	0.8670	0.7798
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)	0.0007	0.0008	0.0011	0.0014	0.0018	0.0021	0.0022	0.0022	0.0019	0.0014	0.0010	0.0008	0.0013
standing storage losses (L_S lb/month & avg is lb/yr)	6.74	6.95	9.76	12.13	16.22	18.32	20.03	19.75	16.40	12.40	8.46	6.94	154.10
working losses (L_W lb/month & avg is lb/yr)	386.10	398.10	559.19	695.49	929.43	1050.25	1148.10	1132.01	939.95	711.00	485.16	397.89	8832.66
total losses (L_T lb/month & avg is lb/yr)	392.84	405.04	568.95	707.62	945.65	1068.58	1168.13	1151.76	956.35	723.40	493.62	404.83	8986.77
max hourly Q in bbl/hour	936.60	936.60	936.60	936.60	936.60	936.60	936.60	936.60	936.60	936.60	936.60	936.60	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.519	0.592	0.752	0.966	1.249	1.459	1.543	1.522	1.305	0.956	0.674	0.535	
breathing/standing loss (L_S lb/hr)	0.009	0.010	0.013	0.019	0.025	0.029	0.029	0.029	0.023	0.017	0.012	0.009	
max hourly total loss (L_T lb/hr)	0.528	0.603	0.765	0.985	1.275	1.487	1.572	1.550	1.328	0.972	0.686	0.544	

L_S sum months	L_W sum months	L_T sum months
154.10	8832.66	8986.77

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	**0.016**	**0.029**	**144.039**
Working Loss L_W	**0.942**	**1.543**	**8,255.861**
Total Loss L_T	**0.959**	**1.572**	**8,399.900**

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	**9f-05-WST-CV**
Tank Description	**3000 BBL Produced Water Storage Tank**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**29.72**
Vertical Height/Horizontal Length (H_S ft)	**24.13**
Roof Height (H_R ft)	**0.93**
Max Liquid Height (H_{LX} ft)	**23.13**
Avg Liquid Height (H_L ft)	**11.57**
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)	**0.3096**

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)	**0.00**
Annual Turnovers, N	**0.00**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**16,045.86**
vapor space outage (H_{VO} ft)	**12.875**
vapor space volume (V_V ft^3)	**8,931.42**

Major City for Meterological Data	**Baton Rouge, LA**
Site Elevation (ft)	**100**
Atmospheric Pressure (P_A psia)	**14.643**
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)	61.60	65.20	71.40	78.00	85.00	89.40	90.90	91.30	87.60	79.70	70.10	63.10	77.80
hourly average minimum ambient temperature (T_{AN} °F)	42.20	44.50	50.50	56.90	65.50	71.40	73.90	73.20	68.60	58.10	48.20	42.80	58.00
daily total solar insolation factor (I btu/ft^2 day)	822	1075	1375	1736	1894	1914	1896	1813	1553	1291	983	784	1428
daily average ambient temperature (T_{AA} °F)	51.90	54.85	60.95	67.45	75.25	80.40	82.40	82.25	78.10	68.90	59.15	52.95	67.90
liquid bulk temperature (T_B °F)	53.65	57.14	63.88	71.15	79.28	84.48	86.44	86.11	81.41	71.65	61.24	54.62	70.94
average vapor temperature (T_V °F)	57.28	61.88	69.94	78.80	87.64	92.92	94.80	94.11	88.26	77.34	65.58	58.08	77.24
daily ambient temperature range (ΔT_A °R)	19.40	20.70	20.90	21.10	19.50	18.00	17.00	18.10	19.00	21.60	21.90	20.30	19.80
daily vapor temperature range (ΔT_V °R)	25.25	29.76	34.16	39.42	40.54	39.78	38.82	38.41	35.35	33.45	29.29	25.42	34.14
daily average liquid surface temperature (T_{LA} °F)	55.46	59.51	66.91	74.98	83.46	88.70	90.62	90.11	84.83	74.50	63.41	56.35	74.09
daily maximum liquid surface temperature (T_{LX} °F)	61.78	66.95	75.45	84.83	93.60	98.64	100.33	99.71	93.67	82.86	70.73	62.70	82.62
daily minimum liquid surface temperature (T_{LN} °F)	49.15	52.07	58.37	65.12	73.32	78.75	80.91	80.51	75.99	66.13	56.09	49.99	65.56
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	0.218	0.252	0.327	0.430	0.568	0.671	0.712	0.701	0.593	0.423	0.289	0.225	0.417
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	0.273	0.327	0.436	0.593	0.781	0.912	0.959	0.942	0.783	0.557	0.372	0.282	0.552
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	0.172	0.192	0.242	0.307	0.406	0.487	0.523	0.516	0.444	0.318	0.223	0.178	0.312
daily vapor pressure range (ΔP_V)	0.1005	0.1349	0.1948	0.2862	0.3749	0.4248	0.4366	0.4260	0.3387	0.2387	0.1498	0.1041	0.2408
vapor space expansion factor (K_E)	0.0560	0.0667	0.0785	0.0939	0.1013	0.1029	0.1019	0.1004	0.0890	0.0794	0.0664	0.0565	0.0809
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)	0.8707	0.8534	0.8178	0.7733	0.7209	0.6861	0.6729	0.6764	0.7119	0.7761	0.8353	0.8671	0.7785
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)	0.0007	0.0008	0.0010	0.0013	0.0017	0.0020	0.0022	0.0021	0.0018	0.0013	0.0009	0.0007	0.0013
standing storage losses (L_S lb/month & avg is lb/yr)	12.32	12.76	18.05	22.60	30.35	34.37	37.60	37.05	30.66	23.04	15.59	12.70	287.08
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)	12.32	12.76	18.05	22.60	30.35	34.37	37.60	37.05	30.66	23.04	15.59	12.70	287.08
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)	0.017	0.019	0.025	0.036	0.047	0.054	0.055	0.054	0.043	0.031	0.022	0.017	
max hourly total loss (L_T lb/hr)	0.017	0.019	0.025	0.036	0.047	0.054	0.055	0.054	0.043	0.031	0.022	0.017	

L_S sum months	L_W sum months	L_T sum months
287.08	0.00	287.08

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**	**0.055**	**267.677**
Working Loss L_W	**0.000**	**0.000**	**0.000**
Total Loss L_T	**0.031**	**0.055**	**267.677**

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-IOT-V**
Tank Description	**1000 BBL Inhibitor Oil Tank-Vent (T-133A)**
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)	**0.71**
Roof Paint Solar Absorptance (R_A)	**0.71**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.2240**

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)	**4,000.00**
Annual Turnovers, N	**4.10**
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	**Baton Rouge, LA**
Site Elevation (ft)	**100**
Atmospheric Pressure (P_A psia)	**14.643**
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)	61.60	65.20	71.40	78.00	85.00	89.40	90.90	91.30	87.60	79.70	70.10	63.10	77.80
hourly average minimum ambient temperature (T_{AN} °F)	42.20	44.50	50.50	56.90	65.50	71.40	73.90	73.20	68.60	58.10	48.20	42.80	58.00
daily total solar insolation factor (I btu/ft^2 day)	822	1075	1375	1736	1894	1914	1896	1813	1553	1291	983	784	1428
daily average ambient temperature (T_{AA} °F)	51.90	54.85	60.95	67.45	75.25	80.40	82.40	82.25	78.10	68.90	59.15	52.95	67.90
liquid bulk temperature (T_B °F)	53.65	57.14	63.88	71.15	79.28	84.48	86.44	86.11	81.41	71.65	61.24	54.62	70.94
average vapor temperature (T_V °F)	57.35	61.98	70.07	78.96	87.81	93.09	94.97	94.27	88.40	77.46	65.67	58.15	77.37
daily ambient temperature range (ΔT_A °R)	19.40	20.70	20.90	21.10	19.50	18.00	17.00	18.10	19.00	21.60	21.90	20.30	19.80
daily vapor temperature range (ΔT_V °R)	25.25	29.76	34.16	39.42	40.54	39.78	38.82	38.41	35.35	33.45	29.29	25.37	34.14
daily average liquid surface temperature (T_{LA} °F)	55.50	59.56	66.97	75.06	83.55	88.79	90.71	90.19	84.90	74.56	63.46	56.38	74.16
daily maximum liquid surface temperature (T_{LX} °F)	61.81	67.00	75.51	84.91	93.68	98.73	100.41	99.80	93.74	82.92	70.78	62.73	82.69
daily minimum liquid surface temperature (T_{LN} °F)	49.19	52.12	58.43	65.20	73.41	78.84	81.00	80.59	76.07	66.19	56.13	50.04	65.62
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	0.218	0.252	0.327	0.431	0.569	0.672	0.714	0.703	0.594	0.424	0.290	0.225	0.418
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	0.273	0.328	0.437	0.595	0.783	0.914	0.962	0.944	0.785	0.558	0.373	0.282	0.554
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	0.173	0.192	0.242	0.308	0.408	0.488	0.524	0.517	0.445	0.319	0.223	0.178	0.312
daily vapor pressure range (ΔP_V)	0.1007	0.1351	0.1951	0.2868	0.3758	0.4258	0.4376	0.4270	0.3394	0.2391	0.1500	0.1040	0.2413
vapor space expansion factor (K_E)	0.0560	0.0667	0.0785	0.0939	0.1013	0.1030	0.1020	0.1005	0.0891	0.0794	0.0664	0.0564	0.0809
vapor molecular weight (M_V lb/lbmole)	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02
monthly hours with avg = total annual	744	672	744	720	744	720	744	744	720	744	720	744	8,760
throughputs (ft^3/month) and avg = total annual	1,907	1,723	1,907	1,846	1,907	1,846	1,907	1,907	1,846	1,907	1,846	1,907	22,456
monthly turnovers (N/month) with avg = total annual	0.35	0.31	0.35	0.34	0.35	0.34	0.35	0.35	0.34	0.35	0.34	0.35	4.10
vented vapor saturation factor (K_S)	0.9080	0.8950	0.8679	0.8331	0.7907	0.7618	0.7507	0.7537	0.7834	0.8354	0.8813	0.9053	0.8373
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)	0.0007	0.0008	0.0010	0.0013	0.0017	0.0020	0.0022	0.0021	0.0018	0.0013	0.0009	0.0007	0.0013
standing storage losses (L_S lb/month & avg is lb/yr)	4.73	4.90	6.94	8.69	11.67	13.22	14.46	14.25	11.79	8.86	5.99	4.88	110.38
working losses (L_W lb/month & avg is lb/yr)	1.01	1.05	1.48	1.86	2.50	2.83	3.09	3.05	2.52	1.89	1.28	1.04	23.60
total losses (L_T lb/month & avg is lb/yr)	5.74	5.95	8.42	10.55	14.17	16.05	17.55	17.30	14.31	10.75	7.27	5.92	133.99
max hourly Q in bbl/hour	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.001	0.002	0.002	0.003	0.003	0.004	0.004	0.004	0.004	0.003	0.002	0.001	
breathing/standing loss (L_S lb/hr)	0.006	0.007	0.009	0.014	0.019	0.021	0.022	0.021	0.017	0.012	0.008	0.007	
max hourly total loss (L_T lb/hr)	0.008	0.009	0.011	0.017	0.022	0.025	0.026	0.026	0.020	0.014	0.010	0.008	

L_S sum months	L_W sum months	L_T sum months
110.38	23.60	133.99

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	**0.012**	**0.022**	**102.911**
Working Loss L_W	**0.003**	**0.004**	**22.005**
Total Loss L_T	**0.014**	**0.026**	**124.916**

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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United States Environmental Protection Agency

Office of Pollution Prevention and Toxics
Washington, DC 20460

March 1999
EPA 745-R-99-005

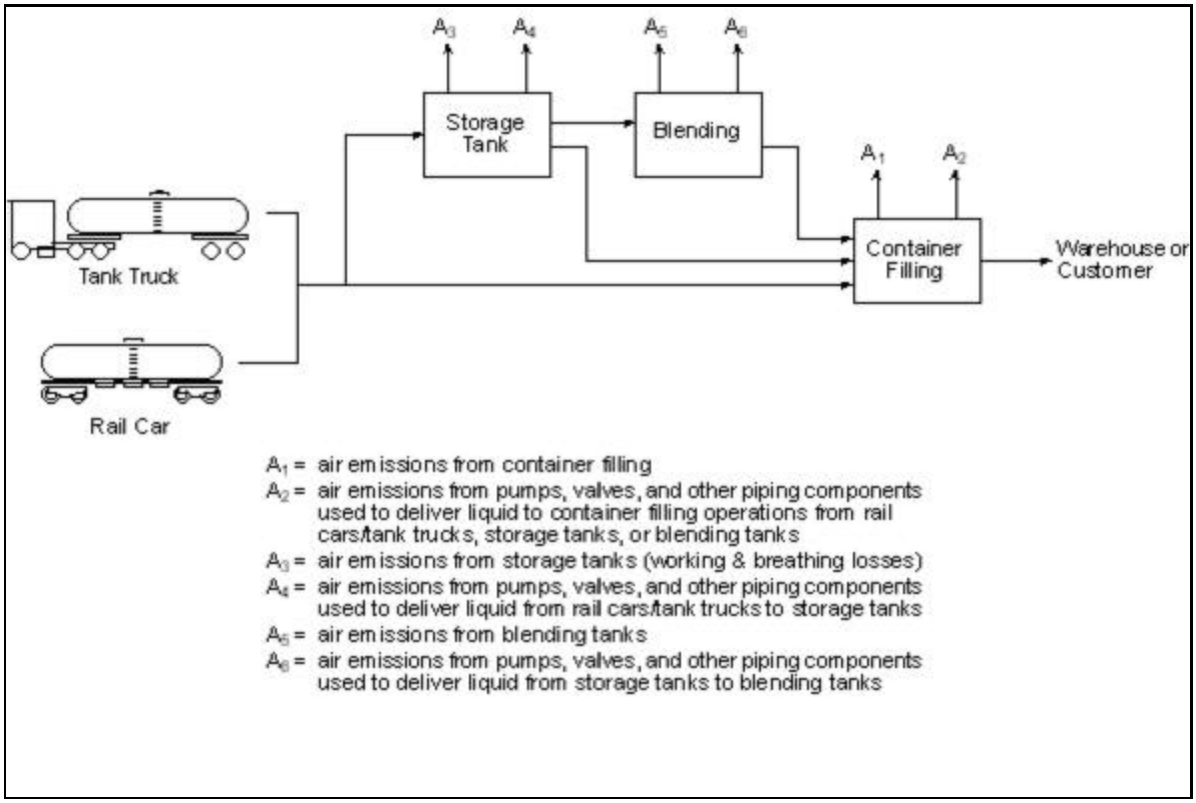
EPCRA Section 313

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

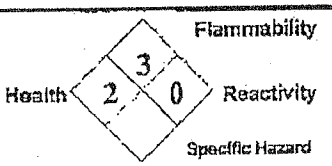
BAKER HUGHES
Baker Petrolite

Material Safety Data Sheet

Section 1. Chemical Product and Company Identification

Product Name	CRO9183 CORROSION INHIBITOR	Code	CRO9183
Supplier	Baker Petrolite A Baker Hughes Company 12645 W. Airport Blvd. (77478) P.O. Box 5050 Sugar Land, TX 77487-5050 For Product Information/MSDSs Call: 800-231-3606 (8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400	Version	2.0
Material Uses	Corrosion Inhibitor.	Effective Date	8/5/2004
24 Hour Emergency Numbers	CHEMTREC 800-424-9300 (U.S. 24 hour) Baker Petrolite 800-231-3606 (001)281-276-5400 CANUTEC 613-996-6666 (Canada 24 hours) CHEMTREC Int'l 01-703-527-3887 (International 24 hour)	Print Date	8/5/2004

National Fire Protection Association (U.S.A.)



Section 2. Composition and Information on Ingredients

Name	CAS #	% by Weight	Exposure Limits
Amine derivatives	Trade secret.	30-60	Not available.
Light aromatic naphtha	64742-95-6	10-30	Not available.
1,2,4-Trimethylbenzene	95-63-6	5-10	Not available.
1,2,3-Trimethylbenzene	526-73-8	1-5	Not available.
1,3,5-Trimethylbenzene	108-67-8	1-5	Not available.
Methanol	67-56-1	10-30	**ACGIH (United States). Skin** TWA: 262 mg/m^3 8 hour(s). STEL: 328 mg/m^3 15 minute(s). TWA: 200 ppm 8 hour(s). STEL: 250 ppm 15 minute(s). **OSHA (United States). Skin** TWA: 200 ppm 8 hour(s). STEL: 250 ppm 15 minute(s). TWA: 260 mg/m^3 8 hour(s). STEL: 325 mg/m^3 15 minute(s).

While trimethylbenzene isomers do not have exposure limits, trimethylbenzene (mixed isomers)(CAS No. 25551-13-7) has TWA value of 25 ppm for both ACGIH and OSHA (revoked limit).

Continued on Next Page

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

Tank ID	**11-05-IOT-V**
Tank Description	**1500 BBL Inhibitor Oil Tank-Vent (T-133B)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**21.50**
Vertical Height/Horizontal Length (H_S ft)	**24.00**
Roof Height (H_R ft)	**0.67**
Max Liquid Height (H_{LX} ft)	**23.00**
Avg Liquid Height (H_L ft)	**11.50**
Breather Vent Pressure Setting (P_{BP} psig)	
Breather Vent Vacuum Setting (P_{BV} psig)	
actual tank pressure (P_I psig)	**0.0**
Shell Paint Solar Absorptance (S_A)	**0.71**
Roof Paint Solar Absorptance (R_A)	**0.71**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.2240**

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)	**6,000.00**
Annual Turnovers, N	**4.03**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**8,350.16**
vapor space outage (H_{VO} ft)	**12.724**
vapor space volume (V_V ft^3)	**4,619.44**

Major City for Meterological Data	**Baton Rouge, LA**
Site Elevation (ft)	**100**
Atmospheric Pressure (P_A psia)	**14.643**
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)	61.60	65.20	71.40	78.00	85.00	89.40	90.90	91.30	87.60	79.70	70.10	63.10	77.80
hourly average minimum ambient temperature (T_{AN} °F)	42.20	44.50	50.50	56.90	65.50	71.40	73.90	73.20	68.60	58.10	48.20	42.80	58.00
daily total solar insolation factor (I btu/ft^2 day)	822	1075	1375	1736	1894	1914	1896	1813	1553	1291	983	784	1428
daily average ambient temperature (T_{AA} °F)	51.90	54.85	60.95	67.45	75.25	80.40	82.40	82.25	78.10	68.90	59.15	52.95	67.90
liquid bulk temperature (T_B °F)	53.65	57.14	63.88	71.15	79.28	84.48	86.44	86.11	81.41	71.65	61.24	54.62	70.94
average vapor temperature (T_V °F)	56.98	61.49	69.45	78.18	86.95	92.23	94.12	93.45	87.70	76.88	65.22	57.79	76.72
daily ambient temperature range (ΔT_A °R)	19.40	20.70	20.90	21.10	19.50	18.00	17.00	18.10	19.00	21.60	21.90	20.30	19.80
daily vapor temperature range (ΔT_V °R)	25.35	29.76	34.16	39.42	40.54	39.78	38.82	38.41	35.35	33.45	29.29	25.65	34.14
daily average liquid surface temperature (T_{LA} °F)	55.32	59.32	66.66	74.66	83.12	88.35	90.28	89.78	84.55	74.26	63.23	56.21	73.83
daily maximum liquid surface temperature (T_{LX} °F)	61.65	66.76	75.20	84.52	93.26	98.30	99.98	99.39	93.39	82.63	70.56	62.62	82.37
daily minimum liquid surface temperature (T_{LN} °F)	48.98	51.88	58.12	64.81	72.98	78.41	80.57	80.18	75.71	65.90	55.91	49.80	65.30
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	0.216	0.250	0.324	0.425	0.561	0.663	0.705	0.694	0.588	0.419	0.287	0.224	0.413
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	0.272	0.325	0.433	0.587	0.773	0.902	0.949	0.932	0.776	0.552	0.370	0.281	0.548
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	0.171	0.191	0.240	0.304	0.402	0.481	0.517	0.510	0.440	0.315	0.221	0.177	0.309
daily vapor pressure range (ΔP_V)	0.1005	0.1341	0.1933	0.2836	0.3714	0.4208	0.4326	0.4223	0.3361	0.2371	0.1490	0.1046	0.2390
vapor space expansion factor (K_E)	0.0562	0.0666	0.0784	0.0937	0.1011	0.1027	0.1016	0.1002	0.0889	0.0793	0.0664	0.0570	0.0808
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	2,861	2,584	2,861	2,769	2,861	2,769	2,861	2,861	2,769	2,861	2,769	2,861	33,684
monthly turnovers (N/month) with avg = total annual	0.34	0.31	0.34	0.33	0.34	0.33	0.34	0.34	0.33	0.34	0.33	0.34	4.03
vented vapor saturation factor (K_S)	0.8727	0.8557	0.8208	0.7772	0.7254	0.6909	0.6778	0.6812	0.7161	0.7795	0.8377	0.8690	0.7820
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)	0.0007	0.0008	0.0010	0.0013	0.0017	0.0020	0.0021	0.0021	0.0018	0.0013	0.0009	0.0007	0.0013
standing storage losses (L_S lb/month & avg is lb/yr)	6.36	6.58	9.29	11.62	15.59	17.66	19.33	19.05	15.78	11.87	8.04	6.56	147.75
working losses (L_W lb/month & avg is lb/yr)	1.51	1.56	2.20	2.76	3.70	4.19	4.58	4.52	3.74	2.82	1.91	1.56	35.04
total losses (L_T lb/month & avg is lb/yr)	7.87	8.14	11.50	14.37	19.29	21.85	23.91	23.57	19.53	14.69	9.95	8.12	182.79
max hourly Q in bbl/hour	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.002	0.002	0.003	0.004	0.005	0.006	0.006	0.006	0.005	0.004	0.003	0.002	
breathing/standing loss (L_S lb/hr)	0.009	0.010	0.013	0.019	0.024	0.028	0.028	0.028	0.022	0.016	0.011	0.009	
max hourly total loss (L_T lb/hr)	0.011	0.012	0.016	0.022	0.029	0.033	0.034	0.034	0.027	0.020	0.014	0.011	

L_S sum months	L_W sum months	L_T sum months
147.75	35.04	182.79

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	**0.016**	**0.028**	**137.834**
Working Loss L_W	**0.004**	**0.006**	**32.692**
Total Loss L_T	**0.019**	**0.034**	**170.526**

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	**12-05-OST-V**
Tank Description	**400 BBL Sand Blowdown Pit Tank**
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)	**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	**Baton Rouge, LA**
Site Elevation (ft)	**100**
Atmospheric Pressure (P_A psia)	**14.643**
Table 7.1-2 Liquid	**crude oil**
*RVP**	**6.80**
*API gravity**	**44.1**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**44.1**
API gravity at 100F	**47.5**
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*
Crude Oil	0.100	50.000	0.04995	0.27678	10.965	4929.295	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)	61.60	65.20	71.40	78.00	85.00	89.40	90.90	91.30	87.60	79.70	70.10	63.10	77.80
hourly average minimum ambient temperature (T_{AN} °F)	42.20	44.50	50.50	56.90	65.50	71.40	73.90	73.20	68.60	58.10	48.20	42.80	58.00
daily total solar insolation factor (I btu/ft^2 day)	822	1075	1375	1736	1894	1914	1896	1813	1553	1291	983	784	1428
daily average ambient temperature (T_{AA} °F)	51.90	54.85	60.95	67.45	75.25	80.40	82.40	82.25	78.10	68.90	59.15	52.95	67.90
liquid bulk temperature (T_B °F)	53.65	57.14	63.88	71.15	79.28	84.48	86.44	86.11	81.41	71.65	61.24	54.62	70.94
average vapor temperature (T_V °F)	56.62	61.03	68.85	77.43	86.14	91.40	93.30	92.67	87.03	76.32	64.80	57.46	76.11
daily ambient temperature range (ΔT_A °R)	19.40	20.70	20.90	21.10	19.50	18.00	17.00	18.10	19.00	21.60	21.90	20.30	19.80
daily vapor temperature range (ΔT_V °R)	25.56	29.76	34.16	39.42	40.54	39.78	38.82	38.41	35.35	33.45	29.45	25.92	34.14
daily average liquid surface temperature (T_{LA} °F)	55.14	59.08	66.37	74.29	82.71	87.94	89.87	89.39	84.22	73.99	63.02	56.04	73.52
daily maximum liquid surface temperature (T_{LX} °F)	61.53	66.52	74.90	84.14	92.85	97.88	99.57	99.00	93.06	82.35	70.38	62.52	82.06
daily minimum liquid surface temperature (T_{LN} °F)	48.75	51.65	57.83	64.43	72.57	77.99	80.16	79.79	75.38	65.62	55.66	49.56	64.99
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	4.016	4.320	4.927	5.662	6.535	7.127	7.356	7.299	6.701	5.632	4.640	4.084	5.588
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	4.517	4.941	5.723	6.693	7.720	8.368	8.595	8.517	7.746	6.495	5.290	4.598	6.464
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	3.561	3.762	4.221	4.760	5.496	6.034	6.260	6.221	5.769	4.862	4.055	3.616	4.807
daily vapor pressure range (ΔP_V)	0.9556	1.1788	1.5013	1.9334	2.2241	2.3343	2.3346	2.2960	1.9768	1.6330	1.2344	0.9819	1.6562
vapor space expansion factor (K_E)	0.1396	0.1715	0.2195	0.2891	0.3491	0.3832	0.3910	0.3826	0.3139	0.2439	0.1798	0.1432	0.2469
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	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)	0.3066	0.2913	0.2649	0.2388	0.2137	0.1995	0.1945	0.1957	0.2095	0.2397	0.2768	0.3030	0.2412
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)	0.0362	0.0387	0.0434	0.0491	0.0558	0.0603	0.0620	0.0616	0.0571	0.0490	0.0412	0.0368	0.0486
standing storage losses (L_S lb/month & avg is lb/yr)	80.40	77.45	96.35	105.44	123.74	129.36	137.49	136.58	122.61	108.61	88.50	81.63	1288.16
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)	80.40	77.45	96.35	105.44	123.74	129.36	137.49	136.58	122.61	108.61	88.50	81.63	1288.16
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)	0.108	0.115	0.130	0.170	0.208	0.231	0.236	0.231	0.188	0.146	0.123	0.110	
max hourly total loss (L_T lb/hr)	0.108	0.115	0.130	0.170	0.208	0.231	0.236	0.231	0.188	0.146	0.123	0.110	

L_S sum months	L_W sum months	L_T sum months
1288.16	0.00	1288.16

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	**0.145**	**0.236**	**1,269.150**
Working Loss L_W	**0.000**	**0.000**	**0.000**
Total Loss L_T	**0.145**	**0.236**	**1,269.151**

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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United States Environmental Protection Agency
Office of Air Quality Planning and Standards Research Triangle Park NC 27711
EPA-453/R-95-017 November 1995
Air

EPA

Protocol for Equipment Leak Emission Estimates

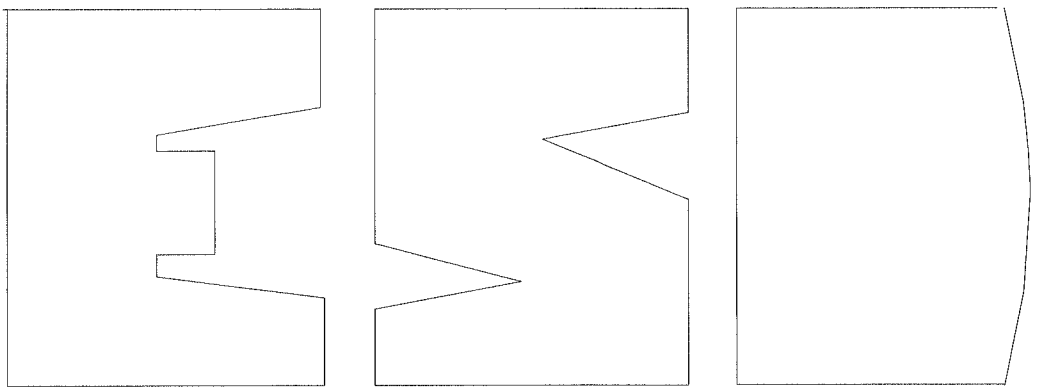


TABLE 2-4. OIL AND GAS PRODUCTION OPERATIONS AVERAGE EMISSION FACTORS (kg/hr/source)

Equipment Type	Service[a]	Emission Factor (kg/hr/source)[b]
Valves	Gas	4.5E-03
	Heavy Oil	8.4E-06
	Light Oil	2.5E-03
	Water/Oil	9.8E-05
Pump seals	Gas	2.4E-03
	Heavy Oil	NA
	Light Oil	1.3E-02
	Water/Oil	2.4E-05
Others[c]	Gas	8.8E-03
	Heavy Oil	3.2E-05
	Light Oil	7.5E-03
	Water/Oil	1.4E-02
Connectors	Gas	2.0E-04
	Heavy Oil	7.5E-06
	Light Oil	2.1E-04
	Water/Oil	1.1E-04
Flanges	Gas	3.9E-04
	Heavy Oil	3.9E-07
	Light Oil	1.1E-04
	Water/Oil	2.9E-06
Open-ended lines	Gas	2.0E-03
	Heavy Oil	1.4E-04
	Light Oil	1.4E-03
	Water/Oil	2.5E-04

[a]Water/Oil emission factors apply to water streams in oil service with a water content greater than 50%, from the point of origin to the point where the water content reaches 99%. For water streams with a water content greater than 99%, the emission rate is considered negligible.

[b]These factors are for total organic compound emission rates (including non-VOC's such as methane and ethane) and apply to light crude, heavy crude, gas plant, gas production, and off shore facilities. "NA" indicates that not enough data were available to develop the indicated emission factor.

[c]The "other" equipment type was derived from compressors, diaphrams, drains, dump arms, hatches, instruments, meters, pressure relief valves, polished rods, relief valves, and vents. This "other" equipment type should be applied for any equipment type other than connectors, flanges, open-ended lines, pumps, or valves.

EPA Average Emission Factors

The EPA emission factors used by GRI-HAPCalc 3.01 to estimate fugitive emissions were developed from data obtained during a joint American Petroleum Institute (API)/GRI fugitive testing program at natural gas production and processing sites [U.S. Environmental Protection Agency, 1995; American Petroleum Institute, 1995]. Over 184,000 components at 20 sites were screened for total hydrocarbon (THC) emissions, and the results were averaged for each component type to develop THC emission factors. Furthermore, a statistical analysis conducted by the EPA found no difference in THC fugitive emissions by industry segment for oil and gas production operation. The average THC emission factors for equipment in gas and light liquid service are shown in Table 20.

Table 20. EPA Average Emission Factors for THC

	Emission Factor, lb THC/yr		
Component	Gas Service	Light Liquids Service	Heavy Liquids Service
Connections	3.9	4.1	0.1
Flanges	7.5	2.1	0.0075
Open-Ended Line	39	27	2.7
Pump Seals	46	250	NA
Valves	87	48	0.16
Other*	170	140	0.62

** The "Other" category includes compressors, diaphragms, drains, dump arms, hatches, instruments, meters, pressure relief valves, polished rods, relief valves, and vents.*

To calculate speciated fugitive emissions for BTEX, methane, NMHC, and NMEHC, composition data obtained during a joint American Petroleum Institute (API)/GRI fugitive testing program are used with the THC emission factors above. The average compositions of fugitive leaks from production facilities and natural gas plants are shown in Table 21.

Table 21. Fractional Composition of Fugitive Emissions

	Fractional Composition, lb/lb THC			
Compound	Gas Production/ Compressor Station	Gas Plant	Light Liquid Service	Heavy Liquid Service
Benzene	0.00023	0.00123	0.00027	0.00935
Toluene	0.00039	0.00032	0.00075	0.00344
Ethylbenzene	0.000020	0.000010	0.000170	0.00051
Xylenes (m,p,o)	0.00010	0.000040	0.000360	0.00372
Methane	0.920	0.564	0.613	0.942
NMHC	0.080	0.436	0.387	0.058
NMEHC	0.0350	0.253	0.292	0.030

The following equation shows how annual emission rates are calculated from the above emission factors. The user-entered component count of each type of fugitive emission source is multiplied by the emission factor (lb THC/component/year) and the fractional composition (lb compound *i* / lb THC). This is then converted to an annual emission rate. Note that all calculations in GRI-HAPCalc 3.01 are done in U.S. Standard units and converted to metric units when necessary.

HEALTH AND
ENVIRONMENTAL
SCIENCES
DEPARTMENT

API PUBLICATION
NUMBER 4615

JANUARY 1995

Emission Factors for Oil and Gas Production Operations

STEP
Strategies for Today's Environmental Partnership

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: 172-23110273-001A

Nov. 29, 2023

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

Station Name:	Olive EOR	Sampled By:	Tim Keene
Station Location:	V-100	Sample Of:	Gas Spot
Sample Point:	v-100	Sample Date:	11/13/2023 11:00
Cylinder No:	3094	Sample Conditions:	800 psig, @ 79 °F
Analyzed:	11/27/2023 09:21:52	PO/Ref. No:	4300204782
		Method:	GPA 2286

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.696 psia		
Nitrogen	0.5178	0.3486		GPM TOTAL C2+	0.940
Methane	8.7353	3.3679			
Carbon Dioxide	87.6349	92.6895			
Ethane	1.2213	0.8826	0.3276		
Propane	0.7954	0.8429	0.2198		
Iso-Butane	0.1841	0.2572	0.0604		
n-Butane	0.3665	0.5119	0.1159		
Iso-Pentane	0.1540	0.2670	0.0565		
n-Pentane	0.1167	0.2024	0.0424		
Hexanes	0.0737	0.1526	0.0304		
n-Hexane	0.0383	0.0793	0.0158		
Benzene	0.0078	0.0146	0.0022		
Cyclohexane	0.0227	0.0459	0.0077		
Heptanes	0.0592	0.1426	0.0274		
Methylcyclohexane	0.0223	0.0526	0.0090		
Toluene	0.0034	0.0075	0.0011		
Octanes	0.0270	0.0741	0.0139		
Xylenes	0.0012	0.0031	0.0005		
Nonanes	0.0156	0.0481	0.0088		
Decanes Plus	0.0028	0.0096	0.0017		
	100.0000	100.0000	0.9411		

Calculated Physical Properties	**Total**	**C10+**
Calculated Molecular Weight	41.61	142.28
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.696 psia & 60°F		
Higher Heating Value, Real Gas Dry BTU	173.9	7742.9
Water Sat. Gas Base BTU	170.9	7607.8
Relative Density Real Gas	1.4441	4.9126
Compressibility Factor	0.9945	

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.

EPN: 15-05-F
(AA-021)

Williston Laboratory
3111 1st Ave W
Williston, ND 58801

Certificate of Analysis

Number: 172-23090296-001A

Oct. 04, 2023

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

Station Name: MS Olive EOR Facility
Sample Point: Flare
Method: GPA 2286
Analyzed: 09/29/2023 09:38:22

Sampled By: John Fielder
Sample Of: Gas Spot
Sample Date: 09/09/2023 09:00
Sample Conditions: 0 psig, @ 84 °F
PO/Ref. No: 4300204782

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.696 psia
Nitrogen	87.0712	71.4111	
Methane	0.0412	0.0194	
Carbon Dioxide	1.7120	2.2059	
Ethane	0.1302	0.1146	0.0348
Propane	0.3219	0.4156	0.0886
Iso-Butane	0.1674	0.2849	0.0548
n-Butane	0.8642	1.4706	0.2723
Iso-Pentane	0.9495	2.0056	0.3471
n-Pentane	2.1688	4.5812	0.7858
Hexanes	2.2715	5.7309	0.9315
n-Hexane	1.6304	4.1134	0.6702
Benzene	0.0937	0.2143	0.0262
Cyclohexane	0.3776	0.9304	0.1285
Heptanes	1.8894	5.5428	0.8714
Methylcyclohexane	0.1597	0.4591	0.0642
Toluene	0.0159	0.0429	0.0053
Octanes	0.1224	0.4093	0.0627
Ethylbenzene	0.0005	0.0016	0.0002
Xylenes	0.0014	0.0044	0.0005
Nonanes	0.0104	0.0391	0.0058
Decanes Plus	0.0007	0.0029	0.0004
	100.0000	100.0000	4.3503

GPM TOTAL C2+ 4.349

Calculated Physical Properties	Total	C10+
Calculated Molecular Weight	34.16	142.28
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.696 psia & 60°F		
Higher Heating Value, Real Gas Dry BTU	497.9	7742.9
Water Sat. Gas Base BTU	489.4	7607.8
Relative Density Real Gas	1.1814	4.9126
Compressibility Factor	0.9979	

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.

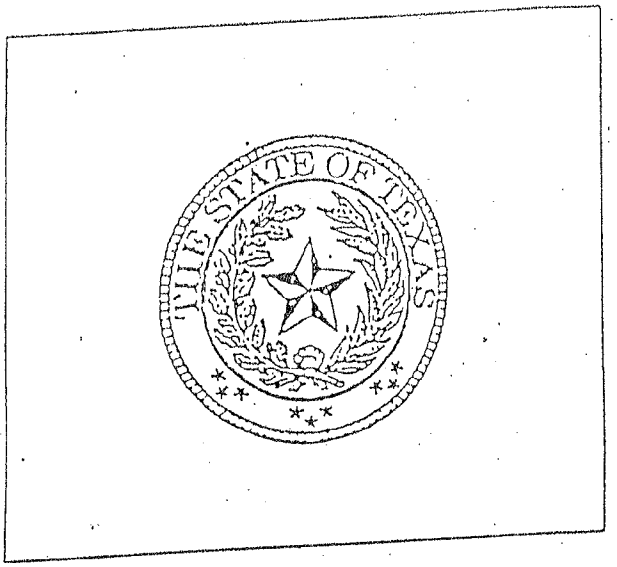
Table 4. Flare Factors

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_2	100 percent S in fuel to SO_2		

Technical Guidance Package for
Chemical Sources

Flare Sources

Texas Natural Resource Conservation Commission



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

Compiled by TNRCC Chemical Section Engineers
November 1994

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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.

<u>NO_x and CO Emissions</u>

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)	0.0485	0.3503
Steam Assisted	Low Btu (192-1000/scf)	0.0680	0.3465
Air & Nonassisted	High Btu (>1000/scf)	0.1380	0.2755
Air & Nonassisted	Low Btu (184-1000/scf)	0.0641	0.5496

Example 2:

For the sample case, calculate the mole percent of each constituent in the waste stream for both the average and maximum scenarios by dividing the individual flow rates by the total flow rates and multiplying by 100 percent.

Table 4: Calculation of constituents in mole percent.

	Average Case		Maximum Case	
	scfm	mole %	scfm	mole %
Butane+	10.16	5.08	12.70	5.08
Propylene	5.94	2.97	7.43	2.97
Propane	5.08	2.54	6.35	2.54
Ethylene	84.74	42.37	105.93	42.37
Ethane	37.28	18.64	46.60	18.64
Hydrogen	22.04	11.02	27.55	11.02
Ammonia	4.24	2.12	5.30	2.12
Inerts	30.50	15.26	38.13	15.26
Totals	200.00	100.00	250.00	100.00

In this case, our calculations are simplified since the average and maximum case waste streams have the same compositions. If they were of different composition, the following heating value calculations would be required for both cases. Note that the maximum case shows the maximum vent stream to the flare under normal operating conditions for the purpose of calculating emissions from the flare (upset and maintenance conditions are not considered).

Next, estimate the net, or lower, heating value of the waste stream

Table 13.5-1 (English Units). THC, NOx AND SOOT EMISSIONS FACTORS FOR FLARE OPERATIONS FOR CERTAIN CHEMICAL MANUFACTURING PROCESSES[a]

Pollutant	SCC[e]	Emissions Factor Value	Emissions Factor Units	Grade or Representativeness
THC, elevated flares[c]	30190099; 30119701; 30119705; 30119709; 30119741	0.14[b,f]	lb/10^6 Btu	B
THC, enclosed ground flares[g,h] Low Percent Load[i]		8.37[j] or 3.88e-3[f]	lb/10^6 scf gas burned lb/10^6 Btu heat input	Moderately
THC, enclosed ground flares[g,h] Normal to High Percent Load[i]		2.56[j] or 1.20e-3[f]	lb/10^6 scf gas burned lb/10^6 Btu heat input	Moderately
Nitrogen oxides, elevated flares[d]		0.068[b,k]	lb/10^6 Btu	B
Soot, elevated flares[d]		0 – 274[b]	μg/L	B

[a] All of the emissions factors in this table represent the emissions exiting the flare. Since the flare is not the originating source of the THC emissions, but rather the device controlling these pollutants routed from a process at the facility, the emissions factors are representative of controlled emissions rates for THC. These values are not representative of the uncontrolled THC routed to the flare from the associated process, and as such, they may not be appropriate for estimating the uncontrolled THC emissions or potential to emit from the associated process.

[b] Reference 1. Based on tests using crude propylene containing 80% propylene and 20% propane.

[c] Measured as methane equivalent. The THC emissions factor may not be appropriate for reporting volatile organic compounds (VOC) emissions when a VOC emissions factor exists.

[d] 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.

[e] See Table 13.5-4 for a description of these SCCs.

[f] Factor developed using the lower (net) heating value of the vent gas.

[g] THC measured as propane by US EPA Method 25A.

[h] These factors apply to well operated ground flares achieving at least 98% destruction efficiency and operating in compliance with the current General Provisions requirements of 40 CFR Part 60, i.e. >200 btu/scf net heating value in the vent gas and less than the specified maximum exit velocity. The emissions factor data set had an average destruction efficiency of 99.99%. Based on tests using pure propylene fuel. References 12 through 33 and 39 through 45.

[i] The dataset for these tests were broken into four different test conditions: ramping back and forth between 0 and 30% of load; ramping back and forth between 30% and 70% of load; ramping back and forth between 70% and 100% of load; and a fixed rate maximum load condition. Analyses determined that only the first condition was statistically different. Low percent load is represented by a unit operating at approximately less than 30% of maximum load.

[j] Heat input is an appropriate basis for combustion emissions factor. However, based on available data, heat input data is not always known, but gas flowrate is generally available. Therefore, the emissions factor is presented in two different forms.

[k] Factor developed using the higher (gross) heating value of the vent gas.

Table 13.5-2 (English Units). VOC and CO EMISSIONS FACTORS FOR ELEVATED FLARE OPERATIONS FOR CERTAIN REFINERY AND CHEMICAL MANUFACTURING PROCESSES[a,b]

Pollutant	SCC[e]	Emissions Factor ($lb/10^6$ Btu)[f]	Representativeness
Volatile organic compounds[c]	30190099; 30600904; 30119701; 30119705; 30119709; 30119741; 30119799; 30130115; 30600201; 30600401; 30600508; 30600903; 30600999; 30601701; 30601801; 30688801; 40600240	0.66	Poorly
Carbon monoxide[d]		0.31	Poorly

[a] The emissions factors in this table represent the emissions exiting the flare. Since the flare is not the originating source of the VOC emissions, but rather the device controlling these pollutants routed from a process at the facility, the emissions factor is representative of controlled emissions rates for VOC. This values is not representative of the uncontrolled VOC routed to the flare from the associated process, and as such, it may not be appropriate for estimating the uncontrolled VOC emissions or potential to emit from the associated process.

[b] These factors apply to well operated flares achieving at least 98% destruction efficiency and operating in compliance with the current General Provisions requirements of 40 CFR Part 60, i.e. >300 btu/scf net heating value in the vent gas and less than the specified maximum flare tip velocity. The VOC emissions factor data set had an average destruction efficiency of 98.9%, and the CO emissions factor data set had an average destruction efficiency of 99.1% (based on test reports where destruction efficiency was provided). These factors are based on steam-assisted and air-assisted flares burning a variety of vent gases.

[c] References 4 through 9 and 11.

[d] References 1, 4 through 8, and 11.

[e] See Table 13.5-4 for a description of these SCCs.

[f] Factor developed using the lower (net) heating value of the vent gas.

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	**22-05-CST**
Tank Description	**215 BBL Corrosion Inhibitor Tank**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**10.20**
Vertical Height/Horizontal Length (H_S ft)	**15.00**
Roof Height (H_R ft)	**0.32**
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)	**0.90**
Roof Paint Solar Absorptance (R_A)	**0.9**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.1063**

Tank Shell Color/Shade	**Red - Primer**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Red - Primer**
Tank Roof Paint Condition	**average**
Roof Type	**vertical tank with cone roof**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**500.00**
Annual Turnovers, N	**2.45**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**1,143.98**
vapor space outage (H_{VO} ft)	**8.106**
vapor space volume (V_V ft^3)	**662.38**

Major City for Meterological Data	**Baton Rouge, LA**
Site Elevation (ft)	**100**
Atmospheric Pressure (P_A psia)	**14.643**
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)	61.60	65.20	71.40	78.00	85.00	89.40	90.90	91.30	87.60	79.70	70.10	63.10	77.80
hourly average minimum ambient temperature (T_{AN} °F)	42.20	44.50	50.50	56.90	65.50	71.40	73.90	73.20	68.60	58.10	48.20	42.80	58.00
daily total solar insolation factor (I btu/ft^2 day)	822	1075	1375	1736	1894	1914	1896	1813	1553	1291	983	784	1428
daily average ambient temperature (T_{AA} °F)	51.90	54.85	60.95	67.45	75.25	80.40	82.40	82.25	78.10	68.90	59.15	52.95	67.90
liquid bulk temperature (T_B °F)	54.12	57.75	64.66	72.14	80.36	85.57	87.52	87.15	82.29	72.39	61.80	55.07	71.76
average vapor temperature (T_V °F)	58.03	62.86	71.20	80.39	89.36	94.66	96.53	95.76	89.67	78.52	66.47	58.79	78.54
daily ambient temperature range (ΔT_A °R)	19.40	20.70	20.90	21.10	19.50	18.00	17.00	18.10	19.00	21.60	21.90	20.30	19.80
daily vapor temperature range (ΔT_V °R)	28.38	33.84	39.38	46.02	47.74	47.05	46.03	45.30	41.25	38.36	33.02	28.32	39.56
daily average liquid surface temperature (T_{LA} °F)	56.07	60.31	67.93	76.26	84.86	90.12	92.02	91.45	85.98	75.45	64.14	56.93	75.15
daily maximum liquid surface temperature (T_{LX} °F)	63.17	68.77	77.77	87.77	96.80	101.88	103.53	102.78	96.30	85.04	72.40	64.01	85.04
daily minimum liquid surface temperature (T_{LN} °F)	48.98	51.85	58.08	64.76	72.93	78.35	80.52	80.13	75.67	65.86	55.88	49.85	65.26
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	1.724	1.927	2.342	2.875	3.526	3.979	4.155	4.101	3.619	2.819	2.127	1.764	2.799
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	2.075	2.391	2.982	3.771	4.622	5.165	5.353	5.267	4.571	3.541	2.616	2.120	3.540
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	1.424	1.540	1.818	2.161	2.651	3.023	3.184	3.154	2.834	2.223	1.716	1.459	2.189
daily vapor pressure range (ΔP_V)	0.6507	0.8512	1.1633	1.6097	1.9714	2.1418	2.1691	2.1125	1.7370	1.3180	0.9006	0.6617	1.3517
vapor space expansion factor (K_E)	0.1054	0.1320	0.1692	0.2227	0.2650	0.2864	0.2902	0.2826	0.2332	0.1832	0.1350	0.1062	0.1881
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	238	215	238	231	238	231	238	238	231	238	231	238	2,807
monthly turnovers (N/month) with avg = total annual	0.21	0.19	0.21	0.20	0.21	0.20	0.21	0.21	0.20	0.21	0.20	0.21	2.45
vented vapor saturation factor (K_S)	0.5744	0.5470	0.4985	0.4474	0.3976	0.3691	0.3591	0.3620	0.3914	0.4522	0.5225	0.5689	0.4541
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)	0.0268	0.0296	0.0354	0.0428	0.0516	0.0576	0.0600	0.0593	0.0529	0.0421	0.0325	0.0273	0.0418
standing storage losses (L_S lb/month & avg is lb/yr)	46.91	46.92	62.12	72.56	90.45	97.83	105.21	104.00	89.79	73.78	55.11	47.92	892.60
working losses (L_W lb/month & avg is lb/yr)	6.38	6.38	8.44	9.86	12.30	13.30	14.30	14.14	12.21	10.03	7.49	6.51	121.34
total losses (L_T lb/month & avg is lb/yr)	53.29	53.30	70.57	82.42	102.75	111.13	119.51	118.14	101.99	83.81	62.60	54.43	1013.94
max hourly Q in bbl/hour	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.009	0.009	0.011	0.014	0.017	0.018	0.019	0.019	0.017	0.013	0.010	0.009	
breathing/standing loss (L_S lb/hr)	0.063	0.070	0.083	0.118	0.150	0.168	0.173	0.167	0.133	0.099	0.077	0.064	
max hourly total loss (L_T lb/hr)	0.072	0.079	0.095	0.131	0.167	0.187	0.192	0.186	0.150	0.113	0.087	0.073	

L_S sum months	L_W sum months	L_T sum months
892.60	121.34	1013.94

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**	**0.173**	**862.264**
Working Loss L_W	**0.013**	**0.019**	**117.216**
Total Loss L_T	**0.112**	**0.192**	**979.481**

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

HT-FG

Certificate of Analysis

Number: 2030-13110170-004A

Carencro Laboratory
4790 NE Evangeline Thruway
Carencro, LA 70520

Nov. 27, 2013

Denbury Resources
5320 Legacy Drive
Plano, TX 75024

Field: Olive
Station Name: EOR Last Vessel Upstream at Oil Dump
Sample Point: Sample Valve
Cylinder No: 2855

Sampled By: JB-FSC
Sample Of: Liquid Spot
Sample Date: 11/05/2013 08:15
Sample Conditions: 199 psig, @ 68 °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	43.16	°		AR	11/20/2013
Specific Gravity @ 60/60° F	ASTM D-5002	0.8101			AR	11/20/2013
Density @ 60° F	ASTM D-5002	0.8093	g/ml		AR	11/20/2013
Shrinkage Factor	Proprietary	0.9418			AR	11/20/2013
Flash Factor	Proprietary	106.9088	Cu. Ft./S.T. Bbl		AR	11/20/2013

Hydrocarbon Laboratory Manager

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

HTFG

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: 13110170-004A

Customer: Denbury Resources, Inc
Attn:
5320 Legacy Dr.
Plano TX 75024

Report Date: 11/27/13
PO / Ref. No.:

Company: Denbury Resources, Inc
Field: Olive
Station: EOR Last Vessel
Station No:
Sample Point: U/S of Oil Dump
Comments: EOS Flash Gas Composition

Sample Of: Flash Gas
Sample Date/Time: 11/05/13
Sample Psig & Temp: 199 psi @ 68 °F
Sampled By: JB-FSC
Cylinder # : 2855

	MOL %	WEIGHT %	GPM's @
NITROGEN			
CO2	84.205	82.386	
METHANE	1.968	0.702	
ETHANE	2.619	1.751	1.004
PROPANE	3.618	3.546	1.346
I-BUTANE	1.103	1.426	0.346
N-BUTANE	2.898	3.744	0.942
I-PENTANE	1.286	2.062	0.360
N-PENTANE	1.061	1.702	0.300
HEXANES	0.547	1.028	0.136
BENZENE	0.101	0.175	0.037
HEPTANES	0.340	0.732	0.076
TOLUENE	0.043	0.089	0.013
OCTANES	0.117	0.293	0.024
E-BENZENE	0.002	0.006	0.001
m,o,&p-XYLENE	0.015	0.036	0.004
NONANES	0.017	0.047	0.003
DECANES PLUS	0.060	0.276	0.010
TOTALS	100.000	100.000	4.602

CALCULATED VALUES

REAL DRY BTU AT 15.025 PSIA, 60 DEG.F	449.7
REAL WET BTU AT 15.025 PSIA, 60 DEG.F	442.0
RELATIVE DENSITY	1.5644
COMPRESSIBILITY FACTOR	0.99211

	C2+	C5+
GPM's @ 15.025 psia, 60 Deg.F	4.602	0.963

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

Tank ID	**25-15-CST**
Tank Description	**750 Gallon Paraffin Inhibitor Tank**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Horizontal**
Tank Diameter (D ft)	**4.00**
Vertical Height/Horizontal Length (H_S ft)	**8.00**
Roof Height (H_R ft)	
Max Liquid Height (H_{LX} ft)	**4.00**
Avg Liquid Height (H_L ft)	**2.00**
Breather Vent Pressure Setting (P_{BP} psig)	
Breather Vent Vacuum Setting (P_{BV} psig)	
actual tank pressure (P_I psig)	**0.0**
Shell Paint Solar Absorptance (S_A)	**0.90**
Roof Paint Solar Absorptance (R_A)	**0.9**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	

Tank Shell Color/Shade	**Red - Primer**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Red - Primer**
Tank Roof Paint Condition	**average**
Roof Type	**horizontal tank**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**238.10**
Annual Turnovers, N	**13.30**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**100.53**
vapor space outage (H_{VO} ft)	**1.571**
vapor space volume (V_V ft^3)	**50.27**

Major City for Meterological Data	**Baton Rouge, LA**
Site Elevation (ft)	**100**
Atmospheric Pressure (P_A psia)	**14.643**
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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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)	61.60	65.20	71.40	78.00	85.00	89.40	90.90	91.30	87.60	79.70	70.10	63.10	77.80
hourly average minimum ambient temperature (T_{AN} °F)	42.20	44.50	50.50	56.90	65.50	71.40	73.90	73.20	68.60	58.10	48.20	42.80	58.00
daily total solar insolation factor (I btu/ft^2 day)	822	1075	1375	1736	1894	1914	1896	1813	1553	1291	983	784	1428
daily average ambient temperature (T_{AA} °F)	51.90	54.85	60.95	67.45	75.25	80.40	82.40	82.25	78.10	68.90	59.15	52.95	67.90
liquid bulk temperature (T_B °F)	54.12	57.75	64.66	72.14	80.36	85.57	87.52	87.15	82.29	72.39	61.80	55.07	71.76
average vapor temperature (T_V °F)	57.70	62.44	70.65	79.70	88.62	93.91	95.78	95.04	89.06	78.01	66.09	58.48	77.98
daily ambient temperature range (ΔT_A °R)	19.40	20.70	20.90	21.10	19.50	18.00	17.00	18.10	19.00	21.60	21.90	20.30	19.80
daily vapor temperature range (ΔT_V °R)	28.38	33.84	39.38	46.02	47.74	47.05	46.03	45.30	41.25	38.36	33.02	28.32	39.56
daily average liquid surface temperature (T_{LA} °F)	55.91	60.09	67.66	75.92	84.49	89.74	91.65	91.09	85.68	75.20	63.95	56.77	74.87
daily maximum liquid surface temperature (T_{LX} °F)	63.00	68.55	77.50	87.42	96.43	101.50	103.16	102.42	95.99	84.79	72.20	63.86	84.76
daily minimum liquid surface temperature (T_{LN} °F)	48.82	51.63	57.81	64.41	72.55	77.97	80.14	79.77	75.36	65.61	55.69	49.69	64.98
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	1.717	1.917	2.326	2.851	3.495	3.945	4.120	4.068	3.593	2.802	2.117	1.757	2.779
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	2.066	2.379	2.962	3.741	4.584	5.123	5.310	5.226	4.540	3.520	2.604	2.112	3.517
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	1.418	1.531	1.806	2.142	2.627	2.996	3.155	3.127	2.813	2.208	1.707	1.452	2.173
daily vapor pressure range (ΔP_V)	0.6484	0.8474	1.1569	1.5989	1.9576	2.1270	2.1544	2.0987	1.7270	1.3114	0.8969	0.6594	1.3442
vapor space expansion factor (K_E)	0.1052	0.1317	0.1686	0.2215	0.2633	0.2845	0.2882	0.2807	0.2319	0.1825	0.1347	0.1060	0.1873
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	1.13	1.02	1.13	1.09	1.13	1.09	1.13	1.13	1.09	1.13	1.09	1.13	13.30
vented vapor saturation factor (K_S)	0.8749	0.8624	0.8378	0.8082	0.7746	0.7528	0.7446	0.7470	0.7697	0.8109	0.8502	0.8724	0.8121
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)	0.0267	0.0295	0.0352	0.0425	0.0512	0.0572	0.0596	0.0589	0.0526	0.0419	0.0323	0.0272	0.0415
standing storage losses (L_S lb/month & avg is lb/yr)	6.32	6.31	8.35	9.74	12.14	13.13	14.12	13.96	12.06	9.92	7.42	6.45	119.91
working losses (L_W lb/month & avg is lb/yr)	3.03	3.02	4.00	4.66	5.81	6.29	6.76	6.69	5.78	4.75	3.55	3.09	57.43
total losses (L_T lb/month & avg is lb/yr)	9.34	9.33	12.35	14.40	17.95	19.41	20.88	20.65	17.84	14.67	10.97	9.55	177.35
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	0.008	0.009	0.009	0.009	0.008	0.006	0.005	0.004	
breathing/standing loss (L_S lb/hr)	0.008	0.009	0.011	0.016	0.022	0.026	0.027	0.026	0.020	0.013	0.010	0.009	
max hourly total loss (L_T lb/hr)	0.013	0.014	0.017	0.022	0.030	0.034	0.036	0.035	0.028	0.020	0.015	0.013	

L_S sum months	L_W sum months	L_T sum months
119.91	57.43	177.35

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	**0.013**	**0.027**	**115.869**
Working Loss L_W	**0.006**	**0.009**	**55.495**
Total Loss L_T	**0.020**	**0.036**	**171.364**

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	**26-17-GST**
Tank Description	**790 Gallon Gasoline Storage Tank**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Horizontal**
Tank Diameter (D ft)	**3.50**
Vertical Height/Horizontal Length (H_S ft)	**11.00**
Roof Height (H_R ft)	
Max Liquid Height (H_{LX} ft)	**3.50**
Avg Liquid Height (H_L ft)	**1.75**
Breather Vent Pressure Setting (P_{BP} psig)	
Breather Vent Vacuum Setting (P_{BV} psig)	
actual tank pressure (P_I psig)	**0.0**
Shell Paint Solar Absorptance (S_A)	**0.90**
Roof Paint Solar Absorptance (R_A)	**0.9**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	

Tank Shell Color/Shade	**Red - Primer**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Red - Primer**
Tank Roof Paint Condition	**average**
Roof Type	**horizontal tank**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**188.10**
Annual Turnovers, N	**9.98**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**105.83**
vapor space outage (H_{VO} ft)	**1.374**
vapor space volume (V_V ft^3)	**52.92**

Major City for Meterological Data	**Baton Rouge, LA**
Site Elevation (ft)	**100**
Atmospheric Pressure (P_A psia)	**14.643**
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			

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)	61.60	65.20	71.40	78.00	85.00	89.40	90.90	91.30	87.60	79.70	70.10	63.10	77.80
hourly average minimum ambient temperature (T_{AN} °F)	42.20	44.50	50.50	56.90	65.50	71.40	73.90	73.20	68.60	58.10	48.20	42.80	58.00
daily total solar insolation factor (I btu/ft^2 day)	822	1075	1375	1736	1894	1914	1896	1813	1553	1291	983	784	1428
daily average ambient temperature (T_{AA} °F)	51.90	54.85	60.95	67.45	75.25	80.40	82.40	82.25	78.10	68.90	59.15	52.95	67.90
liquid bulk temperature (T_B °F)	54.12	57.75	64.66	72.14	80.36	85.57	87.52	87.15	82.29	72.39	61.80	55.07	71.76
average vapor temperature (T_V °F)	57.29	61.90	69.97	78.84	87.68	92.96	94.84	94.15	88.29	77.37	65.60	58.09	77.27
daily ambient temperature range (ΔT_A °R)	19.40	20.70	20.90	21.10	19.50	18.00	17.00	18.10	19.00	21.60	21.90	20.30	19.80
daily vapor temperature range (ΔT_V °R)	28.38	33.84	39.38	46.02	47.74	47.05	46.03	45.30	41.25	38.36	33.02	28.36	39.56
daily average liquid surface temperature (T_{LA} °F)	55.71	59.83	67.32	75.49	84.02	89.26	91.18	90.65	85.29	74.88	63.70	56.58	74.51
daily maximum liquid surface temperature (T_{LX} °F)	62.80	68.29	77.16	86.99	95.96	101.03	102.69	101.97	95.60	84.47	71.96	63.67	84.40
daily minimum liquid surface temperature (T_{LN} °F)	48.61	51.37	57.47	63.98	72.08	77.50	79.67	79.32	74.98	65.29	55.45	49.49	64.62
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	6.409	6.927	7.952	9.203	10.670	11.658	12.037	11.930	10.903	9.104	7.443	6.516	9.046
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	7.320	8.093	9.477	11.222	13.022	14.136	14.517	14.352	12.948	10.751	8.644	7.439	10.739
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	5.591	5.898	6.627	7.482	8.664	9.533	9.901	9.840	9.120	7.663	6.378	5.688	7.570
daily vapor pressure range (ΔP_V)	1.7291	2.1944	2.8500	3.7400	4.3583	4.6030	4.6161	4.5117	3.8276	3.0884	2.2667	1.7511	3.1697
vapor space expansion factor (K_E)	0.2651	0.3495	0.5006	0.7735	1.1847	1.6278	1.8547	1.7454	1.0991	0.6294	0.3779	0.2704	0.6404
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	90	81	90	87	90	87	90	90	87	90	87	90	1,056
monthly turnovers (N/month) with avg = total annual	0.85	0.77	0.85	0.82	0.85	0.82	0.85	0.85	0.82	0.85	0.82	0.85	9.98
vented vapor saturation factor (K_S)	0.6817	0.6646	0.6332	0.5987	0.5627	0.5408	0.5328	0.5350	0.5573	0.6012	0.6484	0.6781	0.6028
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)	0.0716	0.0767	0.0867	0.0987	0.1126	0.1219	0.1254	0.1245	0.1150	0.0979	0.0819	0.0727	0.0973
standing storage losses (L_S lb/month & avg is lb/yr)	45.36	43.88	54.92	60.50	71.31	74.69	79.41	78.81	70.44	62.02	50.17	46.04	737.57
working losses (L_W lb/month & avg is lb/yr)	6.42	6.22	7.78	8.57	10.10	10.58	11.25	11.16	9.98	8.78	7.11	6.52	104.47
total losses (L_T lb/month & avg is lb/yr)	51.78	50.10	62.70	69.07	81.42	85.27	90.66	89.97	80.42	70.80	57.27	52.57	842.03
max hourly Q in bbl/hour	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.009	0.009	0.010	0.012	0.014	0.015	0.015	0.015	0.014	0.012	0.010	0.009	
breathing/standing loss (L_S lb/hr)	0.061	0.065	0.074	0.101	0.166	0.237	0.273	0.256	0.155	0.083	0.070	0.062	
max hourly total loss (L_T lb/hr)	0.070	0.075	0.084	0.113	0.179	0.251	0.288	0.271	0.169	0.095	0.080	0.071	

L_S sum months	L_W sum months	L_T sum months
737.57	104.47	842.03

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	**0.083**	**0.273**	**725.670**
Working Loss L_W	**0.012**	**0.015**	**102.782**
Total Loss L_T	**0.095**	**0.288**	**828.452**

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

VOC Profile Speciation Report

Profile Name : Gasoline - Summer Blend
Profile Number : 1014
Data Quality : B

Control Device : Uncontrolled
Reference(s) : 1
Data Source : A composite of four product types combined in proportion to 1979 sales figures for California was used to develop vapor samples which were analyzed using a dual detector FID/PID GC.

SCC Assignments: 40301003, 40301006, 40301009, 40301103, 40301203, 40400103, 40400106, 40400109 40400112, 40400115, 40400120, 40400203, 40400206, 40400209, 40400213, 40400406

Saroad	CAS Number	Name	Spec_MW	Spec_WT	Peak
43105		ISOMERS OF HEXANE	86.17	4.78	
43106		ISOMERS OF HEPTANE	100.20	1.53	
43107		ISOMERS OF OCTANE	114.23	0.05	
43108		ISOMERS OF NONANE	128.25	0.02	
43120		ISOMERS OF BUTENE	56.10	1.11	
43122		ISOMERS OF PENTANE	72.15	26.79	
43124		C9 OLEFINS	126.24	0.03	
43125		C10 OLEFINS	140.27	0.00	
43202	74-84-0	ETHANE	30.07	0.08	
43204	74-98-6	PROPANE	44.09	1.25	
43212	106-97-8	N-BUTANE	58.12	22.95	
43214	75-28-5	ISO-BUTANE	58.12	9.83	
43216	624-64-6	T-2-BUTENE	56.11	1.21	
43217	590-18-1	CIS-2-BUTENE	56.11	0.98	
43220	109-66-0	N-PENTANE	72.15	8.56	
43223	563-45-1	3-METHYL-1-BUTENE	70.13	0.40	
43224	109-67-1	1-PENTENE	70.13	1.02	
43225	563-46-2	2-METHYL-1-BUTENE	70.13	1.93	
43226	646-04-8	TRANS-2-PENTENE	70.13	1.61	
43227	627-20-3	CIS-2-PENTENE	70.13	0.79	
43228	513-35-9	2-METHYL-2-BUTENE	70.13	1.04	
43230	96-14-0	3-METHYL PENTANE	86.17	2.34	
43231	110-54-3	HEXANE	86.17	1.84	
43232	142-82-5	HEPTANE	100.20	0.32	
43233	111-65-9	OCTANE	114.23	0.02	
43242	287-92-3	CYCLOPENTANE	70.14	0.72	
43245	592-41-6	1-HEXENE	84.16	0.27	
43247	108-08-7	2,4-DIMETHYLPENTANE	100.20	0.51	
43248	110-82-7	CYCLOHEXANE	84.16	0.26	
43250	540-84-1	2,2,4-TRIMETHYLPENTANE	114.22	0.49	
43252	565-75-3	2,3,4-TRIMETHYLPENTANE	114.22	0.08	
43261	108-87-2	METHYLCYCLOHEXANE	98.21	0.13	
43262	96-37-7	METHYLCYCLOPENTANE	84.16	1.66	
43270	922-61-2	3-METHYL-T-2-PENTENE	84.16	0.09	
43271		3,5,5-TRIMETHYLHEXANE	128.26	0.10	
43278	592-13-2	2,5-DIMETHYLHEXANE	114.22	0.11	
43289		C6 OLEFINS	84.16	0.06	

VOC Profile Speciation Report - continued (profile 1014)

Saroad	CAS Number	Name	Spec_MW	Spec_WT	Peak
43291	75-83-2	2,2-DIMETHYLBUTANE	86.17	1.23	
43292	142-29-0	CYCLOPENTENE	68.11	0.25	
43293	27236-46-0	4-METHYL-T-2-PENTENE	84.18	0.25	
43294		C7 OLEFINS	98.18	0.06	
43295	589-34-4	3-METHYLHEXANE	100.20	0.49	
43298		3-METHYLHEPTANE	114.23	0.07	
43299		1-METHYLCYCLOHEXENE	96.17	0.05	
45102	1330-20-7	ISOMERS OF XYLENE	106.16	0.15	
45110		C10 AROMATIC	134.22	0.01	
45201	71-43-2	BENZENE	78.11	0.77	
45202	108-88-3	TOLUENE	92.13	0.66	
45203	100-41-4	ETHYLBENZENE	106.16	0.04	
45204	95-47-6	O-XYLENE	106.16	0.05	
45207	108-67-8	1,3,5-TRIMETHYLBENZENE	120.19	0.02	
45208	95-63-6	1,2,4-TRIMETHYLBENZENE	120.19	0.06	
45211	611-14-3	O-ETHYLTOLUENE	120.19	0.05	
45215	98-06-6	TERT-BUTYLBENZENE	134.21	0.00	
45218	141-93-5	M-DIETHYLBENZENE	134.22	0.00	
45225	526-73-8	1,2,3-TRIMETHYLBENZENE	120.19	0.05	
46712	95-13-6	INDENE	116.16	0.01	
98033		2,2,5-TRIMETHYLHEXANE	128.26	0.02	
98034	40504-55-7	T-2-HEXENE	84.16	0.30	
98035	592-43-8	C-2-HEXENE	84.16	0.42	
98054	107-39-1	2,4,4-TRIMETHYL-1-PENTENE	112.22	0.02	
TOTAL				99.99	