MERIT ENERGY

Merit Energy Company
1501 Stampede Avenue
Cody, WY 82414

March 24, 2022

Colin Schwartz
US EPA Region 8, Air Quality Division
1595 Wynkoop Street
Denver, Colorado 80202

RE: 2021 Steamboat Butte C1 & C3 Tank Battery Title V Annual Emissions and Fees

Dear Mr. Schwartz,

Merit Energy Company (Merit) is submitting the annual emissions reports pursuant to 40 CFR §71.9(h) for the 2021 calendar year. Fees have been calculated in accordance with 40 CFR §71.9(a), and a check in the amount of $4,132.90 with a copy of Form FF (EPA Form 5900-06) has been remitted to:

U.S. EPA
OCFO/OC/ACAD/FCB
Attn: Collections Team
1300 Pennsylvania Ave NW
Mail Code 2733R
Washington, DC 20004

Enclosed are the Federal Operating Permit Fee Filing Forms for the calendar year along with supporting calculations. If you have any questions regarding this submittal, please feel free to contact me at Michelle.Koch@meritenergy.com or at (307) 527-2103.

Sincerely,

Michelle Koch

Michelle Koch
Regulatory and Government Affairs

Enclosure:

United States Environmental Protection Agency

OMB No. 2060-0336, Expires 11/30/2022

Federal Operating Permit Program (40 CFR Part 71)
FEE FILING FORM (FF)

The purpose of this form is to ensure that fee payments made by check are credited to the proper facility and to the proper government account. Send this form, along with form **FEE** and the check, to the appropriate lockbox bank address listed on the following page. This form is required whenever you pay by check, including for initial fee payment and to pay annual fees. Part 71 fees may be paid by check or electronically, and further information on making payments by check or electronically is provided on the following page.

Source or Facility Name Steamboat Butte C1/C3 Tank Battery

Source Location Wind River Reservation

EPA Region where Source Located 8

Mailing Address:

Street/P.O. Box 1501 Stampede Avenue

City Cody

State WY ZIP 82414 -

Contact Person: Michelle Koch

Title Regulatory and Government Affairs

Telephone (307) 527 - 2103 Ext.

Total Fee Payment Remitted: $ 4,132. 90

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United States Environmental Protection Agency

OMB No. 2060-0336, Expires 11/30/2022

Federal Operating Permit Program (40 CFR Part 71)
FEE CALCULATION WORKSHEET (FEE)

Use this form initially, or thereafter on an annual basis, to calculate part 71 fees.

A. General Information

Type of fee (Check one): ___Initial __X__Annual

Deadline for submitting fee calculation worksheet ___/___/_____

For initial fees, emissions are based on (Check one):

___ Actual emissions for the preceding calendar year. (Required in most circumstances.)

___ Estimates of actual emissions for the current calendar year. (Required when operations commenced during the preceding calendar year.)

Date commenced operations ___/___/_____

___ Estimates of actual emissions for the preceding calendar year. (Optional after a part 71 permit was issued to replace a part 70 permit, but only if initial fee payment is due between January 1 and March 31; otherwise use actual emissions for the preceding calendar year.)

For annual fee payment, you are required to use actual emissions for the preceding calendar year.

B. Source Information: Complete this section only if you are paying fees but not applying for a permit.

Source or facility name **Steamboat Butte C1/C3 Tank Battery**

Mailing address: Street or P.O. Box **1501 Stampede Avenue**

City **Cody** State **WY** ZIP **82414** - _____

Contact person **Michelle Koch** Title **Regulatory and Governmental Affairs**

Telephone (**307**) **527** - **2103** Ext Part 71 permit no. **V-WR-000004-2011.00**

C. Certification of Truth, Accuracy and Completeness: Only needed if not submitting a separate form CTAC.

I certify under penalty of law, based on information and belief formed after reasonable inquiry, the statements and information contained in this submittal (form and attachments) are true, accurate and complete.

Name (signed) Bob Georgius

Name (typed) Bob Georgius Date: 3/29/2022

EPA Form 5900-03

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D. Annual Emissions Report for Fee Calculation Purposes -- Non-HAP

You may use this to report actual emissions (tons per year) of regulated pollutants (for fee calculation) on a calendar-year basis for both initial and annual fee calculation purposes. Section E is designed to report HAP emissions. Quantify all actual emissions, including fugitives, but do not include insignificant emissions and certain regulated air pollutants that are not counted for fee purposes, such as CO and GHGs (see instructions). Sum the emissions in each column to calculate subtotals. Subtotals should be reported to the nearest tenth (0.1) of a ton at the bottom of the page. If any subtotal exceeds 4,000 tons, enter 4,000 for that column.

This data is for **2021** (year)

Emissions Unit ID	NOx	VOC	SO2	PM10	Lead	Other
FUG-1	0.0	15.3	0.0	0.0	0.0	--
FL-1	0.0	0.2	1.3	0.1	0.0	--
FL-2	0.5	7.6	25.7	0.0	0.0	--
C1PR-1	0.0	1.7	0.0	0.0	0.0	--
C1PR-2	0.0	1.7	0.0	0.0	0.0	--
C1PR 8013	0.0	0.5	0.0	0.0	0.0	--
C3WTK 8020	0.0	8.1	0.0	0.0	0.0	--
C3WTK 8021	0.0	8.1	0.0	0.0	0.0	--
C3PR 8022	0.0	0.0	0.0	0.0	0.0	--
C1B-1	0.4	0.0	0.0	0.0	0.0	--
MSS-DEGAS	0.0	0.0	0.0	0.0	0.0	--
SUBTOTALS:	1.0	43.2	27.0	0.1	0.0	--

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E. Annual Emissions Report for Fee Calculation Purposes -- HAP

HAP Identification. Identify individual HAP emitted at the facility, identify the CAS number, and assign a unique identifier for use in the second table in this section. Whenever assigning identifier codes, use "HAP1" for the first, "HAP2" for the second, and so on.

Name of HAP	CAS No	Identifier
n-Hexane	110543	HAP1
Benzene	71432	HAP2
Toluene	108883	HAP3
2,2,4-Trimethylpentane	540841	HAP4
Ethylbenzene	100414	HAP5
m-Xylene	1330207	HAP6

HAP Emissions. Report the actual emissions of individual HAP identified above. Use the identifiers assigned in the table above. Include all emissions, including fugitives, and do not include insignificant emissions. Sum the emissions in each column to calculate subtotals. Report subtotals to the nearest tenth (0.1) of a ton at the bottom of the page. If any subtotal exceeds 4,000 tons, enter 4,000.

This data is for ____2021_____ (year)

Emissions Unit ID	Actual Emissions (Tons/Year)							
	HAP__1	HAP_2_	HAP__3	HAP__4	HAP_5_	HAP_6_	HAP___	HAP___
FUG-1	1.0	0.0	0.0	0.0	0.0	0.0		
FL-1	0.0	0.0	0.0	0.0	0.0	0.0		
FL-2	0.5	0.0	0.0	0.0	0.0	0.0		
C1PR-1	0.1	0.0	0.0	0.0	0.0	0.0		
C1PR-2	0.1	0.0	0.0	0.0	0.0	0.0		
C1PR 8013	0.1	0.0	0.0	0.0	0.0	0.0		
C3WTK 8020	0.3	0.0	0.0	0.0	0.0	0.0		
C3WTK 8021	0.3	0.0	0.0	0.0	0.0	0.0		
C3PR 8022	0.0	0.0	0.0	0.0	0.0	0.0		
C1B-1	0.0	0.0	0.0	0.0	0.0	0.0		
MSS-DEGAS	0.0	0.0	0.0	0.0	0.0	0.0		
SUBTOTALS:	2.2	0.0	0.0	0.0	0.0	0.0		

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F. Fee Calculation Worksheet

This worksheet is used to calculate the total fee owed (including the emissions-based fee and the GHG fee adjustment) for both initial and annual fee payment purposes. Reconciliation is only for cases where you are paying the annual fee and you used any type of estimate of actual emissions when you calculated the initial fee. If you do not need to reconcile fees, complete line 1-5 (emissions summary) and then skip down to line 21 (emission calculation). See instructions for more detailed explanation.

EMISSIONS SUMMARY

1. Sum the subtotals from section D of this form (non-HAP) and enter the total, rounded to the nearest tenth (0.1) of a ton.	71.3
2. Sum the subtotals from section E of this form (HAP) and enter the total, rounded to the nearest tenth (0.1) of a ton.	2.2
3. Sum lines 1 and 2.	73.5
4. Enter the emissions that were counted twice. If none, enter "0."	2.2
5. Subtract line 4 from line 3, round to the nearest ton, and enter the result here. This is the **total emissions** that count for fees purposes.	71.3

RECONCILIATION
(WHEN INITIAL FEES WERE BASED ON ESTIMATES FOR THE "CURRENT" CALENDAR YEAR)

Only complete lines 6-10 if you are paying the first annual fee and initial fees were based on estimated actual emissions for the calendar year in which you paid initial fees; otherwise skip to line 11 or to line 21.

6. Enter the total estimated actual emissions for the year the initial fee was paid (previously reported on line 5 of the initial fee form).	
7. If line 5 is greater than line 6, subtract line 6 from line 5, and enter the result. Otherwise enter "0."	
8. If line 6 is greater than line 5, subtract line 5 from line 6, and enter the result. Otherwise enter "0."	
9. If line 7 is greater than 0, multiply line 7 by last year's fee rate ($/ton) and enter the result here. This is the underpayment. Go to line 21.	
10. If line 8 is greater than 0, multiply line 8 by last year's fee rate ($/ton) and enter the result here. This is the overpayment. Go to line 21.	

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RECONCILIATION
(WHEN INITIAL FEES WERE BASED ON ESTIMATES FOR THE "PRECEDING" CALENDAR YEAR)

Only complete lines 11-20 if you are paying the first annual fee and initial fees were based on estimated actual emissions for the calendar year preceding initial fee payment; otherwise skip to line 21. If completing this section, you will also need to complete sections D and E to report actual emissions for the calendar year preceding initial fee payment.

11. Sum the actual emissions from section D (non-HAP) for the calendar year preceding initial fee payment and enter the result here.	
12. Sum the actual emissions from section E (HAP) for the calendar year preceding initial fee payment and enter the result here.	
13. Add lines 11 and 12 and enter the total here. These are total actual emissions for the calendar year preceding initial fee payment.	
14. Enter double counted emission from line 13 here. If none, enter "0."	
15. Subtract line 14 from line 13, round to the nearest ton, and enter the result here.	
16. Enter the total estimated actual emissions previously reported on line 5 of the initial fee form. These are estimated actual emissions for the calendar year preceding initial fee payment.	
17. If line 15 is greater than line 16, subtract line 16 from line 15, and enter the result here. Otherwise enter "0."	
18. If line 16 is greater than line 15, subtract line 15 from line 16, and enter the result here. Otherwise enter "0."	
19. If line 17 is greater than 0, multiply line 17 by last year's fee rate ($/ton) and enter the result here. This is the underpayment.	
20. If line 18 is greater than 0, multiply line 18 by last year's fee rate ($/ton) and enter the result on this line. This is the overpayment.	

EMISSION FEE CALCULATION

21. Multiply line 5 (tons) by the current fee rate ($/ton) and enter the result here. This is the unadjusted emissions fee. Continue on to line 23.	$ 4,132.90

GHG FEE ADJUSTMENT

22. If you are submitting an initial permit application and this is the first time you are paying fees, enter $2,236, otherwise enter "0". [Note that any updates to the initial application are covered under this one-time charge.]	0
23. Enter the number of permit modifications (or related permit actions) you have submitted to the permitting authority since you last paid fees. If none, skip to line 25.	0
24. Multiply the number in line 23 by $365 and enter the result.	0

25. If you have submitted a permit renewal application since the last time you paid fees enter $520, otherwise enter "0"	0
26. Sum line 22, 24, and 25 and enter the result. This is the GHG fee adjustment	0
OTHER ADJUSTMENTS	
27. Add the total on line 21 and the total on line 26 and enter the result.	$ 4,132.90
28. Enter any underpayment from line 9 or 19 here. Otherwise enter "0."	0
29. Enter any overpayment from line 10 or 20 here. Otherwise enter "0."	0
30. If line 28 is greater than "0," add it to line 27 and enter the result here. If line 29 is greater than "0," subtract this from line 27 and enter the result here. Otherwise enter the amount on line 27 here. This is the fee adjusted for over/underpayment.	$ 4,132.90
31. Enter any credit for fee assessment error here. Otherwise, enter "0."	0
32. Subtract line 31 from line 30 and enter the result here. Stop here. This is the **TOTAL FEE (AFTER ADJUSTMENTS)** that you must remit to EPA.	$ 4,132.90

Merit Energy
Steamboat Butte C-1/C-3 Battery
Emissions Summary

RY2021 Actual Air Pollutant Emission Rates

Emission Source	Equipment ID	VOC	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	H_2S	Benzene	HAP	n-Hexane	Toluene	2,2,4-Trimethylpentane	Ethylbenzene	m-Xylene
		tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy
Process Fugitives	FUG-1	15.29	--	--	--	--	--	1.43	0.01	1.02	0.97	0.01	0.01	0.01	0.01
Water Tank Flare	FL-1	0.16	0.04	0.19	4.52E-03	4.52E-03	1.33	0.04	8.64E-05	3.76E-03	3.34E-03	1.14E-04	1.25E-05	6.01E-05	1.45E-04
Process Flare	FL-2	7.64	0.52	2.37	0.06	0.06	26.70	0.68	4.47E-03	0.53	0.51	0.01	3.73E-03	3.79E-03	0.01
C1 Horizontal Pop & Rupture Tank #1	C1PR-1	1.66	--	--	--	--	--	0.15	4.64E-04	0.08	0.07	4.95E-04	4.09E-04	2.76E-04	4.94E-04
C1 Horizontal Pop & Rupture Tank #2	C1PR-2	1.66	--	--	--	--	--	0.15	4.64E-04	0.08	0.07	4.95E-04	4.09E-04	2.76E-04	4.94E-04
C1 Pop & Rupture Tank 8013	C1PR 8013	0.48	--	--	--	--	--	3.91E-03	2.99E-04	0.05	0.05	3.21E-04	2.73E-04	1.80E-04	3.20E-04
C3 Produced Water Tank 8020	C3WTK 8020	8.13	--	--	--	--	--	6.24	0.01	0.29	0.26	0.01	9.18E-04	4.19E-03	0.01
C3 Produced Water Tank 8021	C3WTK 8021	8.13	--	--	--	--	--	6.24	0.01	0.29	0.26	0.01	9.18E-04	4.19E-03	0.01
C3 Pop & Rupture Tank 8022	C3PR 8022	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C1 Bulk Treater Burner	C1B-1	0.02	0.43	0.36	0.03	0.03	0.01	5.98E-05	9.02E-06	0.01	0.01	1.46E-05	--	--	--
Tank Degassing	MSS-DEGAS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL EMISSIONS:		43.18	0.99	2.92	0.09	0.09	27.04	14.93	0.03	2.34	2.20	0.03	0.01	0.02	0.04

Merit Energy
Steamboat Butte C-1/C-3 Battery
Emissions Summary

RY2021 Greenhouse Gas Emission Rates

Emission Source	EPN	CO_2	CH_4	N_2O	CO_2e
		tpy	tpy	tpy	tpy
Process Fugitives	FUG-1	3.78	10.75	--	272.46
Water Tank Flare	FL-1	73.29	1.04	1.33E-04	99.33
Process Flare	FL-2	933.98	7.00	1.68E-03	1109.53
C1 Horizontal Pop & Rupture Tank #1	C1PR-1	0.28	0.40	--	10.40
C1 Horizontal Pop & Rupture Tank #2	C1PR-2	0.28	0.40	--	10.40
C1 Pop & Rupture Tank 8013	C1PR 8013	2.24E-03	3.06E-03	--	0.08
C3 Produced Water Tank 8020	C3WTK 8020	14.06	9.12	--	242.08
C3 Produced Water Tank 8021	C3WTK 8021	14.06	9.12	--	242.08
C3 Pop & Rupture Tank 8022	C3PR 8022	--	--	--	--
C1 Bulk Treater Burner	C1B-1	0.06	1.21E-06	1.16E-06	0.06
Tank Degassing	MSS-DEGAS	--	--	--	0.00
	TOTAL EMISSIONS:	**1,039.79**	**37.84**	**1.82E-03**	**1986.43**

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Merit Energy
Steamboat Butte C-1/C-3 Battery
Facility Information

Oil and Gas Site General Information	
Administrative Information	
Company Name	Merit Energy
Facility/Well Name	Steamboat Butte C-1/C-3
Nearest City/Town	Riverton
County	Fremont
Reporting Year	2021

Technical Information	
Produced Gas Site Throughput (MMSCF/day):	0.03
Produced Gas Site Throughput (MMSCF/year):	12.00
Process Flare Throughput (MMSCF/year):	12.00
Water Tank Flare Throughput (MMSCF/year):	0.37
Oil/Condensate Site Throughput (bbl/day):	385
Oil/Condensate Site Throughput (bbl/year):	140,563
Produced Water C1 Throughput (bbl/day):	10,519
Produced Water C1 Throughput (bbl/year):	3,839,258
Produced Water C3 Throughput (bbl/day):	27,461
Produced Water C3 Throughput (bbl/year):	10,023,215
Are there any sour gas streams at this site?	Yes
Gas H_2S Concentration (ppm)	24,086

Equipment/Process Types	How many for this project?
Fugitives	YES
IC Engines	0
Turbines	0
Compressors (electric)	0
Diesel Engines	0
Heaters-Boilers	1
Separators	5
Oil / Condensate Tanks	7
Produced Water Tanks	4
Miscellaneous Tanks	4
Loading Jobs	0
Glycol Units	0
Amine Units	0
Vapor Recovery Units	2
Flares-Vapor Combustors	2
Thermal Oxidizers	0
MSS	YES

Merit Energy
Steamboat Butte C-1/C-3 Battery
Fugitive Emissions

Background Information

Total fugitive component counts are based on equipment counts at the facility and default average component countrs for major crude oil production equipment (40 CFR Part 98, Subpart W, Table W-1C) and major onshore natural gas production equipment (40 CFR Part 98, Subpart W, Table W-1B). Since both light oil and gas components are present at the facility, the emissions assume the maximum component emission factor.

Component Count for Oil Production

Major equipment	Valves	Flanges	Connectors	Open-ended lines	Other components
Wellhead	5	10	4	0	1
Separator	6	12	10	0	0
Meters/piping	0	0	0	0	0
Heater-treater	8	12	20	0	0
Header	5	10	4	0	0
In-line heaters	0	0	0	0	0
Dehydrators	0	0	0	0	0
Compressors	0	0	0	0	0

Component Count for Gas Production (Western US)

Major equipment	Valves	Flanges	Connectors	Open-ended lines	Other components
Wellhead	11	0	36	1	0
Separators	34	0	106	6	2
Meters/piping	14	0	51	1	1
Heater-treater	0	0	0	0	0
Header	0	0	0	0	0
In-line heaters	14	0	65	2	1
Dehydrators	24	0	90	2	2
Compressors	73	0	179	3	4

Facility Equipment Counts

Major equipment	Gas Production	Oil Production
Wellhead	31	21
Separator	6	2
Meters/piping	2	2
Heater-treater	N/A	1
Header	2	2
In-line heaters	0	N/A
Dehydrators	0	N/A
Compressors	0	N/A

Component Service	Component Counts - MRR Approach				
	Valve	Flanges	Connectors	Open-Ended Line	Other Components
Gas Service	483	0	1494	59	14
Light Oil Service	135	266	132	0	21

Emissions Estimate

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	0.0055	0.00992	135	483	5.34	23.37
Valves	0.000243	0.00086	266	0	0.06	0.28
Flanges	0.00309	0.00441	0	59	0.26	1.14
Open-Ended Lines	0.000463	0.00044	132	1494	0.72	3.15
Connectors	0.0165	0.0194	21	14	0.62	2.71
Other					**7.00**	**30.65**
Total						

* Emission factors are for oil and gas production facilities (not refineries) come from the EPA's "Protocol for Equipment Leak Emission Estimates" November 1995, EPA 4531, R-95-017, Table 2-4.

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

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

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Merit Energy
Steamboat Butte C-1/C-3 Battery
Fugitive Emissions

Speciated Fugitve Emissions*

Component	Light Oil (lb/hr)	Light Oil (ton/year)	Gas (lb/hr)	Gas (ton/year)	Total (lb/hr)	Total (ton/year)
Nitrogen	0.01	0.02	1.28	5.60	1.28	5.63
CO_2	0.14	0.62	0.75	3.26	0.89	3.88
Methane	0.14	0.63	2.31	10.12	2.46	10.76
Ethane	0.32	1.40	0.73	3.19	1.05	4.60
Propane	0.29	1.27	0.76	3.33	1.05	4.60
Isobutane	0.08	0.36	0.27	1.17	0.35	1.53
n-Butane	0.14	0.59	0.46	2.03	0.60	2.62
Isopentane	0.08	0.34	0.32	1.41	0.40	1.75
n-Pentane	0.05	0.20	0.20	0.89	0.25	1.09
i-C6	0.05	0.22	0.27	1.18	0.32	1.40
n-Hexane	0.03	0.15	0.19	0.83	0.22	0.97
Benzene	2.12E-04	9.27E-04	1.71E-03	0.01	1.92E-03	0.01
Cyclohexane	2.86E-03	0.01	0.02	0.09	0.02	0.10
i-C7	0.02	0.10	0.17	0.74	0.19	0.84
n-Heptane	4.02E-04	1.76E-03	3.19E-03	0.01	3.59E-03	0.02
Toluene	2.23E-04	9.76E-04	2.18E-03	0.01	2.40E-03	0.01
2,2,4-Trimethylpentane	1.85E-04	8.10E-04	1.40E-03	0.01	1.58E-03	0.01
n-Octane	4.27E-03	0.02	0.05	0.21	0.05	0.23
Ethylbenzene	1.21E-04	5.32E-04	1.45E-03	0.01	1.57E-03	0.01
m-Xylene	2.17E-04	9.50E-04	2.69E-03	0.01	2.91E-03	0.01
3-Methyloctane	--	--	--	--	--	--
n-Nonane	1.08E-03	4.74E-03	0.02	0.07	0.02	0.08
H_2S	0.09	0.38	0.24	1.06	0.33	1.43
Water	2.74E-05	1.20E-04	0.21	0.91	0.21	0.91
C10+	6.08E-07	2.66E-06	2.48E-05	1.09E-04	2.54E-05	1.11E-04
Total	**1.45**	**6.34**	**8.26**	**36.16**	**9.70**	**42.50**
Total CO_2	**0.14**	**0.62**	**0.75**	**3.26**	**0.89**	**3.88**
Total Methane	**0.14**	**0.63**	**2.31**	**10.12**	**2.46**	**10.76**
Total CO_2e	**3.75**	**16.43**	**58.53**	**256.36**	**62.28**	**272.78**
TOC	**1.21**	**5.32**	**5.78**	**25.33**	**7.00**	**30.65**
VOC	**0.75**	**3.28**	**2.74**	**12.01**	**3.49**	**15.29**
Total HAP	**0.03**	**0.15**	**0.20**	**0.87**	**0.23**	**1.02**

* Fugitive oil emissions speciation is based on the crude oil tank W&B vapors. Fugitive gas emissions speciation is based on sales gas stream.

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Merit Energy
Steamboat Butte C-1/C-3 Battery
C1 Crude Oil Run Tank

Identification - Vertical Fixed Roof Tank		
	Emission Source	C1 Crude Oil Run Tank- 500 BBL
	Equipment ID	C1 Run Tank 8014
	Throughput (BPD)	385
	Throughput (BPY)	140,563
Tank Dimensions		
	Shell Height (ft)	25.0
	Diameter (ft)	12.0
	Volume (gal)	21,151
	Turnovers[a]	310.10
	Net Throughput (gal/yr)	5,903,646
Control Inputs		
	Shell & Roof Color/Shade[b]	Tan
	Shell & Roof Condition	Good
	Meteorological Data	Cheyenne, WY
Tank Contents		
	Crude RVP[c]	5.40
Total Uncontrolled Tank Emissions		
	VOC Flashing Losses (ton/yr)[c]	2.83
	VOC Working & Breathing Losses (ton/yr)[c]	6.44
	Total VOC Losses (ton/yr)[c]	9.27

Notes
[a] Turnovers calculated using equation 1-30 of AP-42, Chapter 7, assuming a maximum fill height of 90% of the tank shell height.
[b] Tan paint color selected in ProMax options to simulate tan paint.
[c] From ProMax AP-42 emissions report.

Uncontrolled Speciated Crude Oil Run Tank Emissions

Component	Crude Oil Run Tank- 500 BBL			
	Working & Breathing (lb/hr)	Flashing (lb/hr)	Working & Breathing (tpy)	Flashing (tpy)
Nitrogen	0.01	0.13	0.04	0.49
CO2	0.28	0.35	1.21	0.98
Methane	0.28	0.77	1.24	2.40
Ethane	0.63	0.42	2.75	1.10
Propane	0.57	0.41	2.50	1.03
Isobutane	0.16	0.13	0.71	0.31
n-Butane	0.27	0.21	1.17	0.51
Isopentane	0.15	0.14	0.67	0.30
n-Pentane	0.09	0.07	0.39	0.18
i-C6	0.10	0.08	0.43	0.21
n-Hexane	0.07	0.05	0.29	0.13
Benzene	4.15E-04	5.02E-04	1.82E-03	1.24E-03
Cyclohexane	0.01	0.01	0.02	0.01
i-C7	0.05	0.04	0.20	0.11
n-Heptane	7.88E-04	7.37E-04	3.45E-03	1.82E-03
Toluene	4.37E-04	5.11E-04	1.92E-03	1.26E-03
2,2,4-Trimethylpentane	3.63E-04	3.42E-04	1.59E-03	8.46E-04
n-Octane	0.01	0.01	0.04	0.02
Ethylbenzene	2.38E-04	2.71E-04	1.04E-03	6.73E-04
m-Xylene	4.26E-04	5.00E-04	1.86E-03	1.24E-03
3-Methyloctane	--	--	--	--
n-Nonane	2.12E-03	2.51E-03	0.01	0.01
H2S	0.17	0.14	0.74	0.36
Water	5.36E-05	6.04	2.36E-04	0.09
C10+	1.18E-06	1.48E-06	5.22E-06	3.69E-06
Total	**2.84**	**2.99**	**12.43**	**8.27**
Total CO2	**0.28**	**0.35**	**1.21**	**0.98**
Total Methane	**0.28**	**0.77**	**1.24**	**2.40**
Total CO_2e	**7.36**	**19.49**	**32.22**	**61.06**
Total VOC	**1.47**	**1.14**	**6.44**	**2.83**
Total HAP	**0.07**	**0.06**	**0.30**	**0.14**

Merit Energy
Steamboat Butte C-1/C-3 Battery
C1 Crude Oil Overflow Tank

Identification: Fixed Roof Tank		
	Emission Source	C1 Crude Oil Overflow Tank- 500 BBL
	Equipment ID	C1 Overflow Tank 8016
	Throughput (BPD)	2.00
	Throughput (BPY)	730
Tank Dimensions		
	Shell Height (ft)	25.0
	Diameter (ft)	12.0
	Volume (gal)	21,151
	Turnovers[a]	1.61
	Net Throughput (gal/yr)	30,660
Other Inputs		
	Shell & Roof Color/Shade[b]	Tan
	Shell & Roof Condition	Good
	Meteorological Data	Cheyenne, WY
Tank Contents		
	Crude RVP[c]	5.40
Total Uncontrolled Tank VOC Emissions		
	VOC Working & Breathing Losses (ton/yr)[c]	0.30

Notes
[a] Turnovers calculated using equation 1-30 of AP-42, Chapter 7, assuming a maximum fill height of 90% of the tank shell height.
[b] Tan paint color selected in ProMax options to simulate tan paint.
[c] From ProMax AP-42 emissions report.

Uncontrolled Speciated Crude Oil Overflow Tank Emissions

	C1 Crude Oil Overflow Tank 500 BBL	
	[illegible]	[illegible]
Nitrogen	1.54E-04	6.74E-04
CO2	3.28E-03	0.01
Methane	3.95E-03	0.02
Ethane	0.01	0.06
Propane	0.03	0.12
Isobutane	0.01	0.03
n-Butane	0.01	0.05
Isopentane	0.01	0.03
n-Pentane	4.00E-03	0.02
i-C6	4.48E-03	0.02
n-Hexane	2.96E-03	0.01
Benzene	1.77E-05	7.76E-05
Cyclohexane	2.51E-04	1.10E-03
i-C7	2.04E-03	0.01
n-Heptane	2.07E-05	9.08E-05
Toluene	1.90E-05	8.33E-05
2,2,4-Trimethylpentane	1.62E-05	7.10E-05
n-Octane	3.75E-04	1.64E-03
Ethylbenzene	1.06E-05	4.65E-05
m-Xylene	1.89E-05	8.29E-05
3-Methyloctane	--	--
n-Nonane	9.52E-05	4.17E-04
H2S	0.01	0.03
Water	2.45E-06	1.07E-05
C10+	3.46E-08	1.52E-07
Total	**0.10**	**0.42**
Total CO2	**3.28E-03**	**0.01**
Total Methane	**3.95E-03**	**0.02**
Total CO_2e	**0.10**	**0.45**
Total VOC	**0.07**	**0.30**
Total HAP	**3.04E-03**	**0.01**

Merit Energy
Steamboat Butte C-1/C-3 Battery
C1 Crude Reject Oil Tank

Identification - Vertical Fixed Roof Tanks		
	Emission Source	C1 Crude Oil Reject Tank - 500 BBL
	Equipment ID	C1 Reject Tank 8015
	Throughput (BPD)	5.00
	Throughput (BPY)	1,825
Tank Dimensions		
	Shell Height (ft)	25.0
	Diameter (ft)	12.0
	Volume (gal)	21,151
	Turnovers[a]	4.03
	Net Throughput (gal/yr)	76,650
Other Inputs		
	Shell & Roof Color/Shade[b]	Tan
	Shell & Roof Condition	Good
	Meteorological Data	Cheyenne, WY
Tank Contents		
	Crude RVP[c]	5.40
Total Uncontrolled Tank VOC Emissions		
	VOC Working & Breathing Losses (ton/yr)[c]	0.34

Notes
[a] Turnovers calculated using equation 1-30 of AP-42, Chapter 7, assuming a maximum fill height of 90% of the tank shell height.
[b] Tan paint color selected in ProMax options to simulate tan paint.
[c] From ProMax AP-42 emissions report.

Uncontrolled Speciated Crude Oil Reject Tank Emissions

Component	Crude Oil Reject Tank- 500 BBL	
	Working & Breathing (lb/hr)	Working & Breathing (tpy)
Nitrogen	3.85E-04	1.68E-03
CO2	0.01	0.04
Methane	0.01	0.04
Ethane	0.03	0.15
Propane	0.03	0.14
Isobutane	0.01	0.04
n-Butane	0.01	0.06
Isopentane	0.01	0.03
n-Pentane	4.67E-03	0.02
i-C6	0.01	0.02
n-Hexane	3.45E-03	0.02
Benzene	2.07E-05	9.06E-05
Cyclohexane	2.92E-04	1.28E-03
i-C7	2.38E-03	0.01
n-Heptane	2.42E-05	1.06E-04
Toluene	2.22E-05	9.72E-05
2,2,4-Trimethylpentane	1.89E-05	8.29E-05
n-Octane	4.38E-04	1.92E-03
Ethylbenzene	1.24E-05	5.43E-05
m-Xylene	2.21E-05	9.68E-05
3-Methyloctane	--	--
n-Nonane	1.11E-04	4.86E-04
H2S	0.01	0.03
Water	2.86E-06	1.25E-05
C10+	4.04E-08	1.77E-07
Total	**0.14**	**0.61**
Total CO2	**0.01**	**0.04**
Total Methane	**0.01**	**0.04**
Total CO_2e	**0.25**	**1.12**
Total VOC	**0.08**	**0.34**
Total HAP	**3.54E-03**	**0.02**

Merit Energy
Steamboat Butte C-1/C-3 Battery
Produced Water C-1 Tanks

Identification - Vertical Fixed Roof Tank		
	Emission Source	(2) Produced Water Tanks - 3000 BBL
	Equipment ID	C1WTK 8006, C1WTK 8007
	Throughput (BPD)	10,518.51
	Throughput (BPY)	3,839,258
Tank Dimensions		
	Shell Height (ft)	24.0
	Diameter (ft)	30.0
	Volume (gal)	126,895
	Turnovers[a]	1,411.67
	Net Throughput (gal/yr)	161,246,834
Other Inputs		
	Shell & Roof Color/Shade[b]	Tan
	Shell & Roof Condition	Good
	Meteorological Data	Cheyenne, WY
Tank Contents		
	Crude RVP[c]	5.40
	Water	99.98%
Total Uncontrolled Tank VOC Emissions (ton/yr)		
	VOC Flashing Losses (ton/yr)[c]	2.72
	VOC Working & Breathing Losses (ton	4.89E-03
	Total VOC Losses (ton/yr)[c]	2.73

Notes
[a] Turnovers calculated using equation 1-30 of AP-42, Chapter 7, assuming a maximum fill height of 90% of the tank shell height.
[b] Tank paint color selected in ProMax options to simulate tan paint.
[c] From ProMax Report.

Uncontrolled Speciated Produced Water Tank Emissions (per TANK)

	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Nitrogen	2.76E-03	0.40	0.40	0.01	1.58	1.59
CO2	0.25	0.59	0.84	1.08	1.82	2.89
Methane	0.02	1.12	1.14	0.09	4.14	4.23
Ethane	0.01	0.34	0.35	0.03	1.21	1.24
Propane	9.29E-04	0.29	0.29	4.07E-03	1.04	1.05
Isobutane	5.27E-05	0.06	0.06	2.31E-04	0.23	0.23
n-Butane	1.31E-04	0.17	0.17	4.86E-04	0.61	0.61
Isopentane	1.41E-05	0.08	0.08	6.16E-05	0.29	0.29
n-Pentane	1.63E-06	0.04	0.04	7.13E-06	0.15	0.15
C-6	1.31E-06	0.05	0.05	5.76E-06	0.20	0.20
n-Hexane	1.88E-07	0.02	0.02	8.23E-07	0.09	0.09
Benzene	3.54E-08	7.61E-04	7.65E-04	1.55E-05	2.32E-03	2.33E-03
Cyclohexane	1.01E-06	0.01	0.01	4.43E-06	0.03	0.03
E-C7	9.37E-08	0.02	0.02	4.10E-07	0.06	0.06
n-Heptane	4.46E-10	2.38E-04	2.38E-04	1.95E-09	9.96E-04	9.96E-04
Toluene	9.59E-07	1.01E-03	1.01E-03	4.20E-06	3.07E-03	3.08E-03
2,2,4-Trimethylpentane	4.32E-10	8.45E-05	8.45E-05	1.89E-09	3.38E-04	3.38E-04
n-Octane	3.57E-10	1.90E-03	1.90E-03	1.56E-09	0.01	0.01
Ethylbenzene	1.47E-07	5.32E-04	5.32E-04	6.45E-07	1.62E-03	1.62E-03
m-Xylene	1.83E-07	1.28E-03	1.28E-03	8.00E-07	3.92E-03	3.92E-03
3-Methyloctane	--	--	--	--	--	--
n-Nonane	2.55E-11	3.90E-04	3.90E-04	1.12E-10	1.66E-03	1.66E-03
H2S	0.08	0.20	0.28	0.35	0.61	0.96
Water	0.56	0.05	0.61	2.47	0.15	2.61
C10+	2.47E-12	3.21E-06	3.21E-06	1.08E-11	1.07E-05	1.07E-05
Total	**0.92**	**3.44**	**4.36**	**4.03**	**12.22**	**16.25**
Total CO2	**0.25**	**0.59**	**0.84**	**1.08**	**1.82**	**2.89**
Total Methane	**0.02**	**1.12**	**1.14**	**0.09**	**4.14**	**4.23**
Total CO_2e	**0.78**	**28.64**	**29.43**	**3.43**	**105.22**	**108.65**
Total VOC	**1.12E-03**	**0.73**	**0.73**	**4.89E-03**	**2.72**	**2.73**
Total HAP	**5.02E-06**	**0.03**	**0.03**	**2.20E-05**	**0.10**	**0.10**

Merit Energy
Steamboat Butte C-1/C-3 Battery
C1 Horizontal Pop & Rupture Tanks

Identification - Horizontal Cylinder Tanks		
	Emission Source	C1 Horizontal Pop & Rupture Tanks
	Equipment ID	C1PR-1, C1PR-2
	Throughput (BPY)	100
Tank Dimensions		
	Shell Length (ft)	40.0
	Diameter (ft)	10.0
	Volume (gal)	23,591
	Turnovers*	0.20
	Net Throughput (gal/yr)	4,200
Other Inputs		
	Shell & Roof Color/Shade[2]	Tan
	Shell & Roof Condition	Good
	Meteorological Data	Cheyenne, WY
Tank Contents		
	Crude RVP[3]	5.40
Total Uncontrolled Tank VOC Emissions (C1S3)		
	VOC Flashing Losses (ton/yr)[3]	0.18
	VOC Working & Breathing Losses (ton/yr)[3]	1.47
	Total VOC Losses (ton/yr)[3]	1.66

Notes
* Turnovers calculated using equation 1-30 of AP-42, Chapter 7, assuming a maximum fill height of 90% of the tank shell height.
[2] Tan paint color selected in ProMax options to simulate tan paint.
[3] From ProMax AP-42 emissions report.

Uncontrolled Speciated Pop & Rupture Tank Emissions (per Tank)

Component	C1 Horizontal Pop & Rupture Tanks			
	Working & Breathing (lb/hr)	Flashing (lb/hr)	Working & Breathing (tpy)	Flashing (tpy)
Nitrogen	1.86E-03	3.99E-03	0.01	0.02
CO2	0.05	0.01	0.23	0.05
Methane	0.06	0.03	0.28	0.12
Ethane	0.15	0.02	0.65	0.07
Propane	0.13	0.02	0.59	0.07
Isobutane	0.04	4.63E-03	0.16	0.02
n-Butane	0.06	0.01	0.26	0.03
Isopentane	0.03	4.44E-03	0.15	0.02
n-Pentane	0.02	2.63E-03	0.09	0.01
i-C6	0.02	3.08E-03	0.10	0.01
n-Hexane	0.01	1.94E-03	0.06	0.01
Benzene	8.85E-05	1.73E-05	3.88E-04	7.60E-05
Cyclohexane	1.25E-03	2.04E-04	0.01	8.91E-04
i-C7	0.01	1.57E-03	0.04	0.01
n-Heptane	1.04E-04	1.57E-05	4.54E-04	6.88E-05
Toluene	9.50E-05	1.80E-05	4.16E-04	7.88E-05
2,2,4-Trimethylpentane	8.10E-05	1.24E-05	3.55E-04	5.42E-05
n-Octane	1.88E-03	3.28E-04	0.01	1.44E-03
Ethylbenzene	5.31E-05	9.83E-06	2.33E-04	4.31E-05
m-Xylene	9.46E-05	1.81E-05	4.15E-04	7.92E-05
3-Methyloctane	--	--	--	--
n-Nonane	4.76E-04	9.16E-05	2.08E-03	4.01E-04
H2S	0.03	4.19E-03	0.13	0.02
Water	1.22E-05	1.13E-03	5.36E-05	0.01
C10+	1.73E-07	3.81E-08	7.59E-07	1.58E-07
Total	**0.63**	**0.11**	**2.78**	**0.47**
Total CO2	**0.05**	**0.01**	**0.23**	**0.05**
Total Methane	**0.06**	**0.03**	**0.28**	**0.12**
Total CO_2e	**1.66**	**0.71**	**7.29**	**3.11**
Total VOC	**0.34**	**0.04**	**1.47**	**0.18**
Total HAP	**0.02**	**2.02E-03**	**0.07**	**0.01**

Merit Energy
Steamboat Butte C-1/C-3 Battery
C1 Pop & Rupture Tank #3

Identification - Horizontal Cylinder Tanks		
	Emission Source	C1 Pop & Rupture Tank 8013 - 2000 BBL
	Equipment ID	C1PR 8013
	Throughput (BPY)	100
Tank Dimensions		
	Shell Length (ft)	24.0
	Diameter (ft)	25.0
	Volume (gal)	88,128
	Turnovers[a]	0.05
	Net Throughput (gal/yr)	4,200
Other Info		
	Shell & Roof Color/Shade[b]	Tan
	Shell & Roof Condition	Good
	Meteorological Data	Cheyenne, WY
Tank Contents		
	Crude RVP	5.40
Total Uncontrolled Tank VOC Emissions		
	VOC Flashing Losses (ton/yr)[c]	9.93E-04
	VOC Working & Breathing Losses (ton/yr)[c]	0.48
	Total VOC Losses (ton/yr)[c]	0.48

Notes
[a] Turnovers calculated using equation 1-30 of AP-42, Chapter 7, assuming a maximum fill height of 90% of the tank shell height.
[b] Tan paint color selected in ProMax options to simulate tan paint.
[c] From ProMax AP-42 emissions report.

Uncontrolled Speciated Pop & Rupture Tank Emissions

Component	C1 Pop & Rupture Tank #3 - 2000 BBL			
	Working & Breathing (lb/hr)	Flashing (lb/hr)	Working & Breathing (tpy)	Flashing (tpy)
Nitrogen	2.14E-05	2.17E-05	9.38E-05	9.50E-05
CO2	4.54E-04	5.72E-05	1.99E-03	2.51E-04
Methane	5.47E-04	1.51E-04	2.40E-03	6.63E-04
Ethane	1.99E-03	8.65E-05	0.01	3.79E-04
Propane	0.01	8.43E-05	0.03	3.69E-04
Isobutane	0.01	2.49E-05	0.03	1.09E-04
n-Butane	0.02	4.04E-05	0.07	1.77E-04
Isopentane	0.03	2.39E-05	0.11	1.05E-04
n-Pentane	0.02	1.41E-05	0.07	6.18E-05
i-C6	0.02	1.65E-05	0.08	7.23E-05
n-Hexane	0.01	1.04E-05	0.05	4.56E-05
Benzene	6.81E-05	9.31E-08	2.98E-04	4.08E-07
Cyclohexane	9.63E-04	1.09E-06	4.22E-03	4.78E-06
i-C7	0.01	8.42E-06	0.03	3.69E-05
n-Heptane	7.98E-05	8.43E-08	3.49E-04	3.69E-07
Toluene	7.32E-05	9.65E-08	3.20E-04	4.23E-07
2,2,4-Trimethylpentane	6.23E-05	6.64E-08	2.73E-04	2.91E-07
n-Octane	1.45E-03	1.76E-06	0.01	7.70E-06
Ethylbenzene	4.09E-05	5.27E-08	1.79E-04	2.31E-07
m-Xylene	7.30E-05	9.69E-08	3.20E-04	4.24E-07
3-Methyloctane	--	--	--	--
n-Nonane	3.67E-04	4.90E-07	1.61E-03	2.15E-06
H2S	8.70E-04	2.26E-05	3.81E-03	9.90E-05
Water	9.44E-06	7.14E-06	4.14E-05	3.13E-05
C10+	1.34E-07	1.93E-07	5.88E-07	8.45E-10
Total	**0.11**	**5.73E-04**	**0.50**	**2.51E-03**
Total CO2	**4.54E-04**	**5.72E-05**	**1.99E-03**	**2.51E-04**
Total Methane	**5.47E-04**	**1.51E-04**	**2.40E-03**	**6.63E-04**
Total CO_2e	**0.01**	**3.84E-03**	**0.06**	**0.02**
Total VOC	**0.11**	**2.27E-04**	**0.48**	**9.93E-04**
Total HAP	**0.01**	**1.08E-05**	**0.05**	**4.74E-05**

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Merit Energy
Steamboat Butte C-1/C-3 Battery
Bulk Treater Burner

Emission Source Information	
Emission Source:	Bulk Treater Burner
Equipment ID:	C1B-1
Heater/Boiler rating (MMBtu/hr):	1
Number of Heaters/Boilers:	2
Rating above is:	Below 100 MMBtu/hr, uncontrolled
Operating hours/year:	8760
Natural Gas Heat Value (Btu/scf)*	1020
Fuel Gas Heat Value (Btu/scf)	1,053
Fuel Rate (scf/hr)^	1899
Fuel Rate (scf/yr)^	16,637,523

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

Pollutant	Emission Factor (lb/mscf)	Emission Factor (lb/MMBtu)	lb/hr	tpy
VOC	5.5	5.39E-03	0.01	0.02
NOx	100	0.10	0.10	0.43
CO	84	0.08	0.08	0.36
PM_{10}	7.6	7.45E-03	0.01	0.03
$PM_{2.5}$	7.6	7.45E-03	0.01	0.03
SO_2	N/A*	N/A	1.28E-03	0.01
HAPs				
Arsenic	0.0002	1.96E-07	1.96E-07	8.59E-07
Benzene	0.0021	2.06E-06	2.06E-06	9.02E-06
Beryllium	0.000012	1.18E-08	1.18E-08	5.15E-08
Cadmium	0.0011	1.08E-06	1.08E-06	4.72E-06
Chromium	0.0014	1.37E-06	1.37E-06	6.01E-06
Cobalt	0.000084	8.24E-08	8.24E-08	3.61E-07
Dichlorobenzene	0.0012	1.18E-06	1.18E-06	5.15E-06
Formaldehyde	0.075	7.35E-05	7.35E-05	3.22E-04
n-Hexane	1.8	1.76E-03	1.76E-03	0.01
Lead	0.0005	4.90E-07	4.90E-07	2.15E-06
Manganese	0.00038	3.73E-07	3.73E-07	1.63E-06
Mercury	0.000026	2.55E-07	2.55E-07	1.12E-06
Naphthalene	0.00061	5.98E-07	5.98E-07	2.62E-06
Nickel	0.0021	2.06E-06	2.06E-06	9.02E-06
POM	0.000089	8.63E-08	8.63E-08	3.78E-07
Toluene	0.0034	3.33E-06	3.33E-06	1.46E-05
Selenium	0.000024	2.35E-08	2.35E-08	1.03E-07
Total HAPs			**1.85E-03**	**0.01**
Other Pollutants				
H_2S	N/A^		1.37E-05	5.98E-05

* Emission factors are taken from AP-42, Chapter 1, Tables 1.4-1 & 1.4-2 dated July 1998.
* SO_2 emissions are conservatively based on 100% conversion of H_2S to SO_2.
^ H_2S emissions are conservatively based on 100% conversion of H_2S to SO_2.
\# Greenhouse Gas Factors from AP-42, Table 1.4.2 Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion.
* Global Warming Potentials from Table A-1 of Subpart A of Part 98 for Mandatory Greenhouse Gas Reporting.

Parameter	Value
scf/Bmscf	379.3
Btu/MMBtu	1,000,000
scf/MMscf	1,000,000
lb/ton	2,000
H2S molecular weight	34.08
SO2 molecular weight	64.06

GHG Pollutant Emissions#		
GHG CO_2 Factor:	120,000	lb/MMscf
GHG CH_4 Factor:	2.3	lb/MMscf
GHG N_2O Factor:	2.2	lb/MMscf
GWP CO_2 Equivalent:	1	
GWP CH_4 Equivalent:	25	
GWP N_2O Equivalent:	298	
CO_2 emissions:	0.06	tpy
CH_4 emissions:	1.21E-06	tpy
N_2O emissions:	1.16E-06	tpy
CO_2e emissions:	0.06	tpy

H_2S Max Concentration (ppmv)	H_2S Mass to Heater Treater (lb/hr)	H_2S Mass to Heater Treater (tpy)
4	6.83E-04	2.99E-03

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

Example Calculation (VOC):

EMISSION FACTOR		1 / HEAT VALUE		HEATER RATING		HOURLY EMISSIONS		ANNUAL OPERATING HOURS		WEIGHT CONVERSION		ANNUAL EMISSIONS
5.5 lb VOC / MMscf	x	1 / 1020 Btu/Scf	x	1MMBtu / hr	=	0.005 lb VOC / hr	x	8,760 hours / yr	x	1 ton / 2,000 lbs	=	0.02 tons VOC / yr

Criteria Pollutant Emission Factors obtained from AP-42 Nat Gas Combustion, Table 1.4-1, (7/98) < 100 MMBtu/hr heat input; & Table 1.4-2, (7/98).

Merit Energy
Steamboat Butte C-1/C-3 Battery
Produced Water C-3 Tanks

Identification - Vertical Fixed Roof Tanks		
	Emission Source	(2) Produced Water Tanks - 300 BBL
	EPN	C3WTK 8020, C3WTK 8021
	Throughput (BPD)	27,461
	Throughput (BPY)	10,023,215
Tank Dimensions		
	Shell Height (ft)	15.0
	Diameter (ft)	12.0
	Volume (gal)	12,690
	Turnovers[a]	36,854.74
	Net Throughput (gal/yr)	420,975,029
Other Inputs		
	Shell & Roof Color/Shade[b]	Tan
	Shell & Roof Condition	Good
	Meteorological Data	Cheyenne, WY
Tank Contents		
	Crude RVP[c]	5.40
	Water	99.97%
Total Uncontrolled Tank VOC Emissions (each)		
	VOC Flashing Losses (ton/yr)[c]	8.12
	VOC Working & Breathing Losses (ton/yr)[c]	0.01
	Total VOC Losses (ton/yr)[c]	8.13

Notes
[a] Turnovers calculated using equation 1-30 of AP-42, Chapter 7, assuming a maximum fill height of 90% of the tank shell height.
[b] Tan paint color selected in ProMax options to simulate tan paint.
[c] From ProMax report.

Uncontrolled Speciated Produced Water Tank Emissions (per TANK)

Component	(2) Produced Water Tanks - 300 BBL					
	Working & Breathing (lb/hr)	Flashing (lb/hr)	Individual Emissions (lb/hr)	Working & Breathing (tpy)	Flashing (tpy)	Individual Emissions (tpy)
Nitrogen	0.01	1.05	1.05	0.03	4.09	4.12
CO2	1.12	3.08	4.20	4.88	9.17	14.06
Methane	0.04	2.45	2.49	0.18	8.94	9.12
Ethane	0.02	1.13	1.15	0.08	3.92	4.01
Propane	2.52E-03	0.90	0.90	0.01	3.24	3.25
Isobutane	1.36E-04	0.18	0.18	5.95E-04	0.68	0.68
n-Butane	2.87E-04	0.50	0.50	1.26E-03	1.81	1.82
Isopentane	3.54E-05	0.22	0.22	1.55E-04	0.83	0.83
n-Pentane	4.07E-06	0.10	0.10	1.78E-05	0.43	0.43
i-C6	3.29E-06	0.15	0.15	1.44E-05	0.58	0.58
n-Hexane	4.64E-07	0.06	0.06	2.03E-06	0.26	0.26
Benzene	8.85E-06	2.20E-03	2.21E-03	3.87E-05	0.01	0.01
Cyclohexane	2.30E-06	0.02	0.02	1.01E-05	0.07	0.07
i-C7	2.18E-07	0.04	0.04	9.53E-07	0.17	0.17
n-Heptane	--	--	--	--	--	--
Toluene	2.26E-06	2.75E-03	2.75E-03	9.89E-06	0.01	0.01
2,2,4-Trimethylpentane	1.02E-09	2.30E-04	2.30E-04	4.48E-09	9.18E-04	9.18E-04
n-Octane	8.62E-10	0.01	0.01	3.77E-09	0.02	0.02
Ethylbenzene	3.41E-07	1.42E-03	1.42E-03	1.49E-06	4.19E-03	4.19E-03
m-Xylene	4.32E-07	3.51E-03	3.51E-03	1.89E-06	0.01	0.01
3-Methyloctane	--	--	--	--	--	--
n-Nonane	5.78E-11	1.02E-03	1.02E-03	2.53E-10	4.35E-03	4.35E-03
H2S	0.48	1.41	1.89	2.10	4.13	6.24
Water	1.43	0.14	1.57	6.26	0.41	6.67
C10+	1.07E-10	8.51E-05	8.51E-05	4.67E-10	2.99E-04	2.99E-04
Total	3.09	11.46	14.55	13.55	38.79	52.34
Total CO2	1.12	3.09	4.20	4.88	9.17	14.06
Total Methane	0.04	2.45	2.49	0.18	8.94	9.12
Total CO_2e	2.13	64.27	66.40	9.34	232.75	242.08
Total VOC	3.01E-03	2.20	2.20	0.01	8.12	8.13
Total HAP	1.23E-05	0.07	0.07	5.41E-05	0.29	0.29

Merit Energy
Steamboat Butte C-1/C-3 Battery
C3 Pop & Rupture Tank #4

Identification Inputs		
	Emission Source	C3 Pop & Rupture Tank 8022- 1000 BBL
	Equipment ID	CJPR 8022
	Throughput (BPY)	--
Tank Dimensions		
	Shell Length (ft)	16.5
	Diameter (ft)	21.5
	Volume (gal)	43,493
	Turnovers*	--
	Net Throughput (gal/yr)	--
Other Inputs		
	Shell & Roof Color/Shade*	Tan
	Shell & Roof Condition	Good
	Meteorological Data	Cheyenne, WY
Tank Contents		
	Crude RVP*	5.40
Total Uncontrolled Tank VOC Emissions		
	VOC Flashing Losses (ton/yr)*	--
	VOC Working & Breathing Losses (ton/yr)*	--
	Total VOC Losses (ton/yr)*	--

Notes
* Turnovers calculated using equation 1-30 of AP-42, Chapter 7, assuming a maximum fill height of 90% of the tank shell height.
* Tan paint color selected in ProMax options to simulate Tan paint.
* From ProMax AP-42 Emissions Report

Uncontrolled Speciated Pop & Rupture Tank Emissions*

	[illegible]	[illegible]	[illegible]	[illegible]
Nitrogen	--	--	--	--
CO2	--	--	--	--
Methane	--	--	--	--
Ethane	--	--	--	--
Propane	--	--	--	--
Isobutane	--	--	--	--
n-Butane	--	--	--	--
Isopentane	--	--	--	--
n-Pentane	--	--	--	--
i-C6	--	--	--	--
n-Hexane	--	--	--	--
Benzene	--	--	--	--
Cyclohexane	--	--	--	--
i-C7	--	--	--	--
n-Heptane	--	--	--	--
Toluene	--	--	--	--
2,2,4-Trimethylpentane	--	--	--	--
n-Octane	--	--	--	--
Ethylbenzene	--	--	--	--
m-Xylene	--	--	--	--
3-Methyloctane	--	--	--	--
n-Nonane	--	--	--	--
H2S	--	--	--	--
Water	--	--	--	--
C10+	--	--	--	--
Total	--	--	--	--
Total CO2	--	--	--	--
Total Methane	--	--	--	--
Total CO_2e	--	--	--	--
Total VOC	--	--	--	--
Total HAP	--	--	--	--

*C3 Pop & Rupture tank received no throughput in RY2021.

Merit Energy
Steamboat Butte C-1/C-3 Battery
FL-1 Annual

Component	Flare Feed Rates and Composition[a,b] Pilot (ton/year)	Produced Water C-1 Tanks W&B (ton/year)	Produced Water C-1 Tanks Flash (ton/year)	Total (ton/year)	Flare DRE% (%)	Flare Exhaust Components (ton/year)
Nitrogen	0.25	0.01	1.15	1.41	0%	**1.41**
CO2	0.17	0.82	1.38	2.37	0%	**2.37**
Methane	17.67	0.07	3.06	20.80	95%	**1.04**
Ethane	0.58	0.02	0.89	1.49	95%	**0.07**
Propane	0.41	3.01E-03	0.77	1.19	95%	**0.06**
Isobutane	0.16	1.70E-04	0.17	0.33	95%	**0.02**
n-Butane	0.13	3.59E-04	0.45	0.59	95%	**0.03**
Isopentane	0.09	4.55E-05	0.21	0.31	95%	**0.02**
n-Pentane	0.05	5.26E-06	0.11	0.16	95%	**0.01**
i-C6	0.38	4.25E-06	0.15	0.53	95%	**0.03**
n-Hexane	--	6.07E-07	0.07	0.07	95%	**3.33E-03**
Benzene	--	1.17E-05	1.75E-03	1.76E-03	95%	**8.81E-05**
Cyclohexane	--	3.28E-06	0.02	0.02	95%	**1.01E-03**
i-C7	--	3.03E-07	0.05	0.05	95%	**2.28E-03**
n-Heptane	--	1.44E-09	7.32E-04	7.32E-04	95%	**3.66E-05**
Toluene	--	3.13E-06	2.29E-03	2.29E-03	95%	**1.15E-04**
2,2,4-Trimethylpentane	--	1.40E-09	2.49E-04	2.49E-04	95%	**1.25E-05**
n-Octane	--	1.15E-09	0.01	0.01	95%	**3.00E-04**
Ethylbenzene	--	4.79E-07	1.20E-03	1.20E-03	95%	**6.02E-05**
m-Xylene	--	5.93E-07	2.90E-03	2.90E-03	95%	**1.45E-04**
3-Methyloctane	--	--	--	--	95%	--
n-Nonane	--	8.25E-11	1.23E-03	1.23E-03	95%	**6.14E-05**
H2S	--	0.26	0.45	0.71	95%	**0.04**
Water	--	1.83	0.11	1.93	0%	**1.93**
TEG	--	--	--	--	95%	--
DGA	--	--	--	--	95%	--
C10+	--	7.94E-12	7.92E-06	7.92E-06	95%	**3.96E-07**
Total	**19.90**	**3.00**	**9.05**	**31.96**	--	**7.02**
Total VOC	**1.23**	**3.61E-03**	**2.01**	**3.25**	--	**0.16**
Total HAP	--	**1.65E-05**	**0.07**	**0.07**	--	**3.75E-03**
Heat Value of Stream (Btu/scf)	1,053.04	118.53	1,054.11	**977.32**		
Molecular Weight	17.24	22.60	26.01	--		
SO_2 emissions (tpy)	--	0.48	0.85	**1.33**		
Volumetric Flow (scf/yr)	876,000.00	100,853.77	264,146.23	**1,241,000.00**		
Total heat release (MMBtu/yr)	922.46	11.95	278.44	**1,212.86**		

Criteria Pollutant Emissions[d]		
NO_x factor:	0.0680	lb/MMBtu
CO factor:	0.3100	lb/MMBtu
PM_{10} factor:	7.60	lb/MMscf
$PM_{2.5}$ factor:	7.60	lb/MMscf
NO_x emissions from flare:	**0.04**	**ton/yr**
CO emissions from flare:	**0.19**	**ton/yr**
SO_2 emissions from flare:	**1.33**	**ton/yr**
PM_{10} emissions from flare:	**4.52E-03**	**ton/yr**
$PM_{2.5}$ emissions from flare:	**4.52E-03**	**ton/yr**
H_2S emissions from flare:	**0.04**	**ton/yr**

GHG Pollutant Emissions[e,f]		
GHG CO_2 Factor[e]:	116.98	lb/MMBTU
GHG N_2O Factor[e]:	2.20E-04	lb/MMBTU
GWP CO_2 Equivalent[f]:	1	
GWP CH_4 Equivalent[f]:	25	
GWP N_2O Equivalent[f]:	298.00	
CO_2 emissions:	73.31	**tpy**
CH_4 emissions:	1.04	**tpy**
N_2O emissions[g]:	1.33E-04	**tpy**
CO_2e emissions:	99.34	**tpy**

[a] Uncontrolled stream compositions determined via ProMax. Flowrates based on measured gas volumes to flare.
[b] Tank emissions determined in ProMax. Annual flash emissions are calculated at the average bulk liquid temperature.
[c] Flare Exhaust (tpy) = Total Uncontrolled Emissions (tpy) x (100-Flare DRE (%)).
[d] Flare CO and NO_x emission factors from AP-42 Table 13.5-1, February 2018. PM_{10} and $PM_{2.5}$ emission factors from AP-42, Table 1.4-1 and 1.4-2, July 1998. SO_2 emissions assume 100% conversion of H_2S to SO_2.
[e] 40 CFR 98 Subpart C, Table C-1 and C-2. Emission Factor (lb/MMBtu) = Emission factor (kg/MMBtu) * (2.20462 lb/kg)
[f] Global Warming Potentials from Table A-1 of Subpart A of Part 98 for Mandatory Greenhouse Gas Reporting.
[g] 40 CFR 98.233 (Subpart W), equation W-40. Mass N_2O = (10E-3) x scf x HHV x EF

Merit Energy
Steamboat Butte C-1/C-3 Battery
FL-2 Annual

Component	Pilot (ton/year)	Produced Gas C-1 HT (ton/year)	Crude Oil Run Tank 8014 WSB (ton/year)	Crude Oil Run Tank 8014 Flash (ton/year)	Crude Oil Overflow Tank 8016 WSB (ton/year)	Crude Oil Reject Tank 8013 WSB (ton/year)	Total (ton/year)	Flare DRE% (%)	Flare Exhaust Components[1] (ton/year)
	Flare Feed Rates and Composition[a,b]								
Nitrogen	0.25	65.52	0.05	0.55	7.93E-04	1.88E-03	66.37	0%	**66.37**
CO2	0.17	38.15	1.35	1.19	0.02	0.04	40.83	0%	**40.83**
Methane	17.67	118.35	1.39	2.68	0.02	0.05	140.15	95%	**7.01**
Ethane	0.58	37.31	3.08	1.23	0.07	0.17	42.44	95%	**2.12**
Propane	0.41	38.94	2.79	1.15	0.13	0.15	43.58	95%	**2.18**
Isobutane	0.16	13.68	0.80	0.35	0.04	0.04	15.07	95%	**0.75**
n-Butane	0.13	23.71	1.30	0.57	0.06	0.07	25.84	95%	**1.29**
Isopentane	0.09	16.53	0.75	0.34	0.03	0.04	17.78	95%	**0.89**
n-Pentane	0.05	10.40	0.44	0.20	0.02	0.02	11.13	95%	**0.56**
i-C6	0.38	13.80	0.48	0.23	0.02	0.03	14.95	95%	**0.75**
n-Hexane	--	9.65	0.32	0.15	0.01	0.02	10.14	95%	**0.51**
Benzene	--	0.09	2.03E-03	1.38E-03	8.67E-05	1.01E-04	0.09	95%	**4.57E-03**
Cyclohexane	--	1.00	0.03	0.02	1.23E-03	1.43E-03	1.05	95%	**0.05**
i-C7	--	8.70	0.22	0.12	0.01	0.01	9.06	95%	**0.45**
n-Heptane	--	0.16	3.86E-03	2.04E-03	1.01E-04	1.18E-04	0.17	95%	**0.01**
Toluene	--	0.11	2.14E-03	1.41E-03	9.30E-05	1.09E-04	0.12	95%	**0.01**
2,2,4-Trimethylpentane	--	0.07	1.78E-03	9.45E-04	7.93E-05	9.26E-05	0.07	95%	**3.73E-03**
n-Octane	--	2.49	0.04	0.03	1.84E-03	2.14E-03	2.56	95%	**0.13**
Ethylbenzene	--	0.07	1.17E-03	7.52E-04	6.20E-05	6.07E-05	0.08	95%	**3.81E-03**
m-Xylene	--	0.14	2.08E-03	1.39E-03	9.27E-05	1.08E-04	0.14	95%	**0.01**
3-Methyloctane	--	--	--	--	--	--	--	95%	--
n-Nonane	--	0.87	0.01	0.01	4.66E-04	5.43E-04	0.89	95%	**0.04**
H2S	--	12.36	0.82	0.40	0.03	0.04	13.68	95%	**0.68**
Water	--	10.64	2.63E-04	0.10	1.20E-05	1.40E-05	10.74	0%	**10.74**
TEG	--	--	--	--	--	--	--	95%	--
DGA	--	--	--	--	--	--	--	95%	--
C10+	--	1.27E-03	5.83E-06	4.12E-06	1.69E-07	1.98E-07	1.28E-03	95%	**6.40E-05**
Total	**19.90**	**422.75**	**13.88**	**9.33**	**0.47**	**0.68**	**466.92**	--	**135.39**
Total VOC	**1.23**	**140.41**	**7.20**	**3.16**	**0.33**	**0.38**	**152.71**	--	**7.64**
Total HAP	--	**10.13**	**0.33**	**0.15**	**0.01**	**0.02**	**10.64**	--	**0.53**
Heat Value of Stream (Btu/scf)	1,053.04	1,177.30	1,841.09	1,309.28	2,278.52	2,010.45	**1,187.47**		
Molecular Weight	17.24	28.03	37.15	28.33	43.47	38.72	--		
SO_2 emissions (tpy)	--	23.28	1.55	0.76	0.06	0.07	**25.71**		
Volumetric Flow (scf/yr)	876,000.00	11,447,507.62	283,631.78	247,391.58	8,142.75	13,326.27	**12,876,000.00**		
Total heat release (MMBtu/yr)	922.46	13,475.99	522.15	323.90	18.55	26.79	**15,289.89**		

Criteria Pollutant Emissions[d]		
NO_x factor:	0.0680	lb/MMBtu
CO factor:	0.3100	lb/MMBtu
PM_{10} factor:	7.60	lb/MMscf
$PM_{2.5}$ factor:	7.60	lb/MMscf
NO_x emissions from flare:	**0.52**	**ton/yr**
CO emissions from flare:	**2.37**	**ton/yr**
SO_2 emissions from flare:	**25.71**	**ton/yr**
PM_{10} emissions from flare:	**0.06**	**ton/yr**
$PM_{2.5}$ emissions from flare:	**0.06**	**ton/yr**
H_2S emissions from flare:	**0.68**	**ton/yr**

GHG Pollutant Emissions[e,f]		
GHG CO_2 Factor[e]:	116.98	lb/MMBTU
GHG N_2O Factor[e]:	2.20E-04	lb/MMBTU
GWP CO_2 Equivalent[f]:	1	
GWP CH_4 Equivalent[f]:	25	
GWP N_2O Equivalent[f]:	298.00	
CO_2 emissions:	935.11	**tpy**
CH_4 emissions:	7.01	**tpy**
N_2O emissions[g]:	1.68E-03	**tpy**
CO_2e emissions:	1,110.81	**tpy**

[a] Uncontrolled stream compositions determined via ProMax. Flowrates based on measured gas volumes to flare.
[b] Tank emissions determined in ProMax. Annual flash emissions are calculated at the average bulk liquid temperature.
[c] Flare Exhaust (tpy) = Total Uncontrolled Emissions (tpy).
[d] Flare CO and NO_x emission factors from AP-42 Table 13.5-1, February 2018. PM_{10} and $PM_{2.5}$ emission factors from AP-42, Table 1.4-1 and 1.4-2, July 1998. SO_2 emissions assume 100% conversion of H_2S to SO_2.
[e] 40 CFR 98 Subpart C, Table C-1 and C-2. Emission Factor (lb/MMBtu) = Emission factor (kg/MMBtu) * (2.20462 lb/kg)
[f] Global Warming Potentials from Table A-1 of Subpart A of Part 98 for Mandatory Greenhouse Gas Reporting.
[g] 40 CFR 98.233 (Subpart W), equation W-40. Mass N_2O = (10E-3) x scf x HHV x EF

Merit Energy
Steamboat Butte C-1/C-3 Battery
MSS-DEGASSING

Planned MSS - Degassing Due to Passive Expansion / Thermal Expansion / Non-Forced Ventilation

		C1Run Tank 8014	C1Overflow Tank 8016	C1Reject Tank 8015
MSS Controls?		none	none	none
Control Efficiency (%)		0.0%	0.0%	0.0%
Event duration, hours/event		0.00	0.00	0.00
Events per year		0.00	0.00	0.00
Tank Diameter, ft		16.00	16.00	16.00
Tank Height, ft		21.00	21.00	21.00
Vapor Space Volume, ft^3 *		2111.2	2111.2	2111.2
Venting Gas MW (lb/lb-mol)[b]		37.15		
VOC wt %[b]		0.52%	0.00%	0.00%
Benzene wt%[b]		0.00015%	0.00019%	0.00015%
n-Hexane wt%[b]		0.02310%	0.00263%	0.00210%
Toluene wt%[b]		0.00015%	0.02137%	0.01710%
2,2,4-Trimethylpentane wt%[b]		0.00013%	0.00022%	0.00017%
Ethylbenzene wt%[b]		0.00008%	0.00020%	0.00016%
m-Xylene wt%[b]		0.00015%	0.00017%	0.00014%
H_2S wt%[b]		0.06%	0.00394%	0.00315%
HAPs wt%[b]		0.02%	0.00011%	0.00009%
CO_2 wt%[b]		0.10%	0.00020%	0.00016%
CH_4 wt%[b]		0.10%	0.00000%	0.00000%
Tank Temperature,	°F	0.00	0.00100%	0.00080%
True Vapor Pressure,	psia	5.23	0.06463%	0.05173%
Emissions,	lb/event	83.02	0.00003%	0.00002%
Hourly Total Emissions,	lb/hr	0.00	0.00000%	0.00000%
Annual Total Emissions,	TPY	0.00	0.00000%	0.00000%
Total CO2,	TPY	--	--	--
Total Methane,	TPY	--	--	--
Total CO_2e,	TPY	--	--	--
Total VOC,	TPY	--	--	--
Total HAP,	TPY	--	--	--
Total H2S,	TPY	--	--	--
Total Benzene,	TPY	--	--	--
Total n-Hexane	TPY	--	--	--
Total Toluene	TPY	--	--	--
Total 2,2,4-Trimethylpent	TPY	--	--	--
Total Ethylbenzene	TPY	--	--	--
Total m-Xylene	TPY	--	--	--

Total Emissions	lb/hr	TPY
Total	--	--
Total CO2	--	--
Total Methane	--	--
Total CO_2e	--	--
Total VOC	--	--
Total HAP	--	--
Total H2S	--	--
Total Benzene	--	--
Total n-Hexane	--	--
Total Toluene	--	--
Total 2,2,4-Trimethylpent	--	--
Total Ethylbenzene	--	--
Total m-Xylene	--	--

* Assuming 50% of tank is filled

[b] From ProMax Tank Loss Stream

Ideal Gas Constant, [(ft3*psia)/(R*lb-mol)]
10.73159

United States Environmental Protection Agency

OMB No. 2060-0336, Expires 11/30/2022

Federal Operating Permit Program (40 CFR Part 71)
CERTIFICATION OF TRUTH, ACCURACY, AND COMPLETENESS (CTAC)

#

This form must be completed, signed by the "Responsible Official" designated for the facility or emission unit, and sent with each submission of documents (i.e., application forms, updates to applications, reports, or any information required by a part 71 permit).

A. Responsible Official

Name: (Last) Georgius (First) Bob (MI) ____

Title Operations Manager

Street or P.O. Box 2553 Hamilton Dome Road

City Thermopolis State WY ZIP 82443 - ____

Telephone (307) 921 - 0081 Ext. ____ Facsimile (307) 867 - 2347

B. Certification of Truth, Accuracy and Completeness (to be signed by the responsible official)

I certify under penalty of law, based on information and belief formed after reasonable inquiry, the statements and information contained in these documents are true, accurate and complete.

Name (signed) Bob Georgius

Name (typed) Bob Georgius Date: 3 / 29 / 2022