Mull Drilling Company, Inc.
1700 N. Waterfront Parkway, Bld. 1200
Wichita, Kansas 67206
Tel: +1 316.264.6366
Fax. +1 316.264.6440
www.mulldrlg.com

January 9, 2022

Colorado Oil & Gas Conservation Commission
Permitting Division
1120 Lincoln Street, Suite 801
Denver, Colorado

RE:

Form 4 Sundry Submittal
MUSF #2 Tank Battery Gas Capture Plan
API #05-017-06249, API #05-017-06273, API #05-017-06257, API #05-017-06281
API # 05-017-06283
COGCC Facility Id: Not Available
Cogcc Doc# 402921114

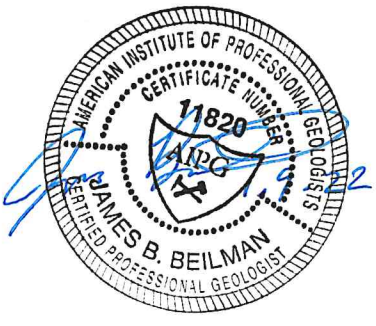
To whom it may concern:

In this ***Form 4 Sundry*** Submittal you will find the Gas Capture Plan from Mull Drilling Company., Inc. (Mull) for the MUSF #2 Crude Oil Tank Battery and associated equipment (API *Various as displayed above*). Mull is also including all required paperwork and recent Colorado Department of Health & Environment APEN Submittals.

Should there be any questions or concerns feel free to contact us,

James Beilman

James Beilman, PG, CPG
Environmental / Safety Manager
Tel: +1 316.264.6366 (128)
Cell: +1 316.364.9203
JBeilman@Mulldrilling.com



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MUSF # 2 Crude Oil Tank Battery

API #05-017-06249

API #05-017-06273

API #05-017-06257

API #05-017-06281

API #05-017-06283

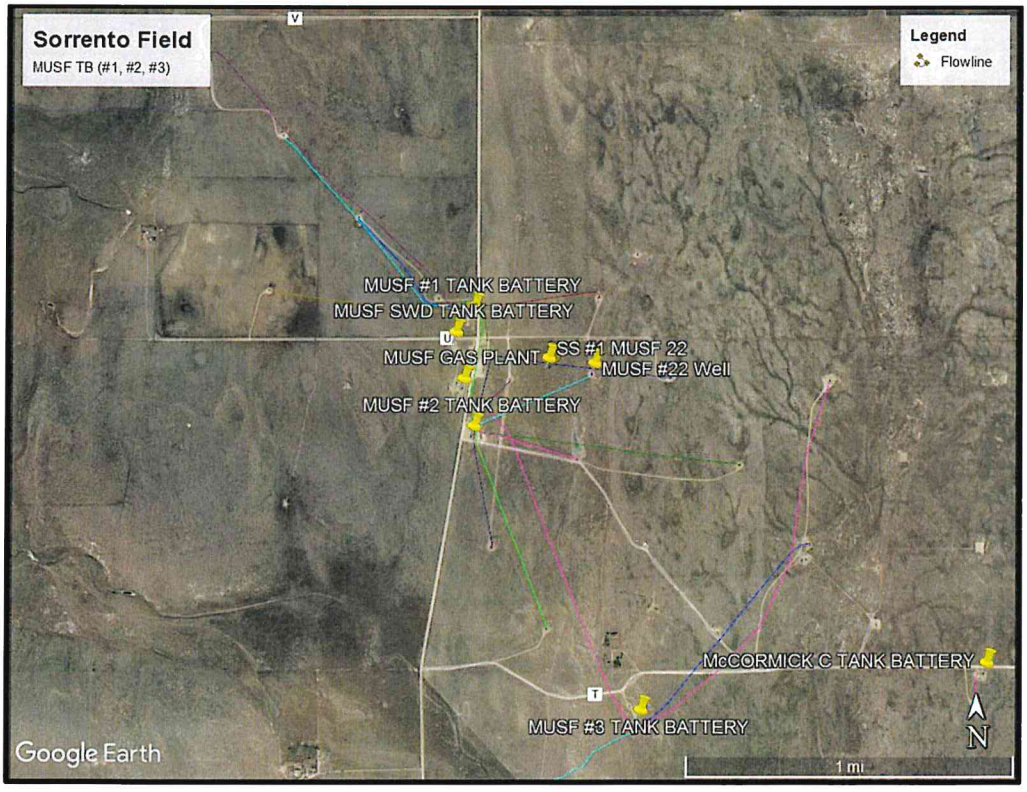
CDPHE Permit Number 02CY0280 AIRS ID 017-0005-009

Sec 4, T14S, R49W

Cheyenne County, Colorado

GAS CAPTURE PLAN

Site Map



Mull Drilling Company., Inc. (Mull) has drafted this plan to comply with Rules 903.d and 903.e.(1).B. The MUSF #2 Tank Battery and associated wells were constructed in 1980. They consist of the consolidated production facilities for 5 operated wells: the location contains 4 oil storage tanks (400 bbl – Total 1600 bbl total), 1 300 bbl water tank, 1 25 bbl water tank, 1

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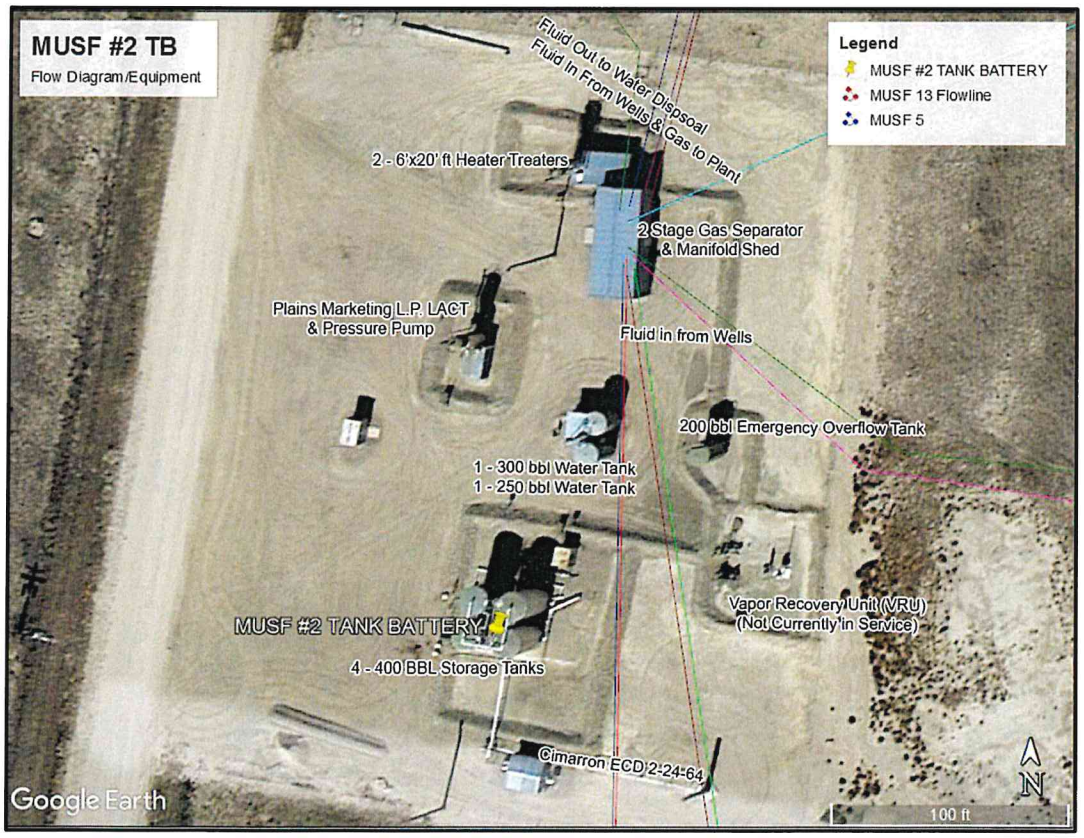
200 bbl emergency overflow tank, 2 - 6'x20' ft Heater Treaters, 1 Vapor Recovery Unit (not in service) and 1 Leed HOC-24-21 ECD. Produced water is disposed to the local Sorrento Plant SWD. The wells are powered via electrical motors and electricity.

Gas at this tank battery is separated and sent to the Sorrento Compressor Station for Re-injection into the reservoir. The Gas is of poor quality due to significant (and increasing) nitrogen concentrations. The station operates under CDPHE permit numbers 85CY204-1 for Engine source emissions and 95CY049 for VOC Fugitive emissions.

Liquids are loaded directly into Plain Marketing Lease Automatic Custody Transfer (LACT) and pressured up as required for transport through a high pressure line.

This is not a request to Vent or Flare.

Flow Diagram



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903.d: Emissions During Production	Gas at this facility is continuing to drop in quality as the local nitrogen plant continues to inject nitrogen into the reservoir. Currently, any available gas is piped from heater treaters, burned for beneficial reuse in the treaters themselves or sent to the compressor station for reinjection, which is not the case at this time. Otherwise all otherwise available gas (Flash) is currently routed to the ECD for final combustion.
903.e.(1).B.i: Description of the Closest Gas Gathering System	All available gas not used for beneficial reuse is sent to the compressor station for reinjection into the reservoir.
903. e.(1).B.ii: Company operating the closest Gas Gathering System	NA
903. e.(1).B.iv: Production Test Plans	The Original Production Test and analytical are supplied (As available). This includes original gas analysis and liquids analysis/modeling updated for rolling 12 emissions calculations through 2021. A copy of the Latest APEN Update is also being supplied.
903. e.(1).B.v: Safety Risks	Mull does not currently anticipate any safety risks that will require us to allow gas to escape rather than being captured or combusted during normal operating procedures.
903. e.(1).B.vi: Operational BMPs	Mull intends to use the following list of operational best practices to minimize Venting during active and planned maintenance allowed pursuant to Rule 903.d.(1).B: During maintenance activities, Mull will have appropriate gas control equipment on location to minimize all Venting. Flow for liquids is all into the LACT and to Plains Marketing L.P. for final sale. Should Liquid Loading/Unloading occur, flowback controls have been installed to prevent any venting or release of emissions. All facilities maintain a rigorous LDAR Program. In this case MUSF #2 TB is checked semi-annually for leaks and verified (when necessary) with a PID/FID approved by the CDPHE and the COGCC. All Tanks in this system maintain a real-time monitoring system to determine fluid totals. All tanks have sight glasses for visual inspection of fluids during daily gauging events.

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	All Wells have pressure/trip Murphy switches that will shutdown the well in the event of a leak.
903. e.(1).B.vii: Procedures to reduce well liquids unloading events	Mull anticipates Well Liquid Unloading events as required for operation. Flowback controls have been installed at this location to send emitted gases to the tanks and then the combustor.
903. e.(1).B.viii: Anticipated volumes of liquids and gas production	As displayed by Mulls latest APEN, liquids production is anticipated to not exceed approximately 70000 bbl per year. The 12 month rolling total from October 2021 produces approximately 1.13 tpy Flash VOC's. As stated, flow back controls are installed on this tank battery.

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November 10, 2020

Colorado Department of Public Health and Environment
Air Pollution Control Division
APCD-SS-B1
4300 Cherry Creek Drive South
Denver, Co 80246 - 1530

RE: ***MUSF #2 Tank Battery***
AIRS ID 017-0005-0009/Permit #08CY0280
APEN Update – Crude Oil Storage Tank Form APCD-210 rev 07/20

To whom it may concern:

Enclosed you will find an APEN update for Mull Drilling Company's (Mull) MUSF #2 Crude Oil Tank Battery and associated equipment. The APEN update site specific data. For calculations we utilized the APCD workbook and have supplied a copy of those calculations.

Should there be any questions or concerns feel free to contact us,

James Beilman, PG, CPG
Environmental / Safety Manager
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Cell: +1 316.807.8880
JBeilman@Mulldrilling.com

AMERICAN INSTITUTE OF PROFESSIONAL GEOLOGISTS
CERTIFICATE NUMBER
11820
AIPG
JAMES B. BEILMAN
CERTIFIED PROFESSIONAL GEOLOGIST

COPY

Crude Oil Storage Tank(s) APEN
Form APCD-210

Air Pollutant Emission Notice (APEN) and
Application for Construction Permit

All sections of this APEN and application must be completed for both new and existing facilities, including APEN updates. Incomplete APENs will be rejected and will require re-submittal. *Your APEN will be rejected if it is filled out incorrectly, is missing information, or lacks payment for the filing fee. The re-submittal will require payment for a new filing fee.*

This APEN is to be used for tanks that store crude oil associated with oil and gas industry operations. If your emission source does not fall into this category, there may be a more specific APEN available for your source (e.g. condensate storage tanks, produced water storage tanks, hydrocarbon liquid loading, etc.). In addition, the General APEN (Form APCD-200) is available if the specialty APEN options will not satisfy your reporting needs. A list of all available APEN forms and associated addendum forms can be found on the Air Pollution Control Division (APCD) website.

This emission notice is valid for five (5) years. Submission of a revised APEN is required 30 days prior to expiration of the five-year term, or when a reportable change is made (significant emissions increase, increase production, new equipment, change in fuel type, etc.). See Regulation No. 3, Part A, II.C. for revised APEN requirements.

Permit Number: 02CY0280 **AIRS ID Number:** 017 / 0005 / 009

[Leave blank unless APCD has already assigned a permit # and AIRS ID]

Section 1 - Administrative Information

Company Name[1]: Mull Drilling Company

Site Name: MUSF #2 Crude Oil Tank Battery

Site Location: S4, T14S, R49W

Site Location County: Cheyenne

NAICS or SIC Code: 1311

Mailing Address: *(Include Zip Code)*
1700 N. Waterfront Parkway, Building 1200
Wichita, KS

Contact Person: James Beilman

Phone Number: 316-807-8880

E-Mail Address[2]: JBeilman@MullDrlg.com

[1] Use the full, legal company name registered with the Colorado Secretary of State. This is the company name that will appear on all documents issued by the APCD. Any changes will require additional paperwork.

[2] Permits, exemption letters, and any processing invoices will be issued by the APCD via e-mail to the address provided.

Permit Number: 02CY0280 AIRS ID Number: 017 / 0005 / 009

[Leave blank unless APCD has already assigned a permit # and AIRS ID]

Section 2 - Requested Action

☐ **NEW permit OR newly-reported emission source**

☐ Request coverage under traditional construction permit

☐ Request coverage under General Permit GP08

If General Permit coverage is requested, the General Permit registration fee of $353.13 must be submitted along with the APEN filing fee.

- OR -

☐ **MODIFICATION to existing permit** *(check each box below that applies)*

☐ Change in equipment ☐ Change company name[3]

☐ Change permit limit ☐ Transfer of ownership[4] ☐ Other *(describe below)*

- OR -

☑ **APEN submittal for update only (Note blank APENs will not be accepted)**

- ADDITIONAL PERMIT ACTIONS -

☐ **APEN submittal for permit exempt/grandfathered source**

☐ **Limit Hazardous Air Pollutants (HAPs) with a federally-enforceable limit on Potential To Emit (PTE)**

Additional Info & Notes: Crude Oil Storage for Grandfathered Source

[3] For company name change, a completed Company Name Change Certification Form (Form APCD-106) must be submitted.
[4] For transfer of ownership, a completed Transfer of Ownership Certification Form (Form APCD-104) must be submitted.

Section 3 - General Information

General description of equipment and purpose: Crude Oil Storage

Company equipment Identification No. (*optional*): 001

For *existing* sources, operation began on: 2/20/1980

For *new or reconstructed* sources, the projected start-up date is:

Normal Hours of Source Operation: 24 hours/day 7 days/week 52 weeks/year

Storage tank(s) located at: ☑ Exploration & Production (E&P) site ☐ Midstream or Downstream (non E&P) site

Will this equipment be operated in any NAAQS nonattainment area?	☐	Yes	☑	No
Are Flash Emissions anticipated from these storage tanks?	☑	Yes	☐	No
Are these storage tanks subject to Colorado Oil and Gas Conservation Commission (COGCC) 805 series rules? If so, submit Form APCD-105.	☐	Yes	☑	No
Are you requesting ≥ 6 ton/yr VOC emissions (per storage tank), or are uncontrolled actual emissions ≥ 6 ton/yr (per storage tank)?	☐	Yes	☑	No

Permit Number: 02CY0280 AIRS ID Number: 017 / 0005 / 009

[Leave blank unless APCD has already assigned a permit # and AIRS ID]

Section 4 - Storage Tank(s) Information

	Actual Annual Amount *(bbl/year)*	Requested Annual Permit Limit[5] *(bbl/year)*
Crude Oil Throughput:	60240.67	70000

From what year is the *actual annual* amount? 08/19 - 08/20

Average API gravity of sales oil: 39.9 degrees RVP of sales oil: 5.6

Tank design: ☑ Fixed roof ☐ Internal floating roof ☐ External floating roof

Storage Tank ID	# of Liquid Manifold Storage Vessels in Storage Tank	Total Volume of Storage Tank *(bbl)*	Installation Date of Most Recent Storage Vessel in Storage Tank *(month/year)*	Date of First Production *(month/year)*
001	4	1600	5/12	2/80

Wells Serviced by this Storage Tank or Tank Battery[6] (E&P Sites Only)		
API Number	**Name of Well**	**Newly Reported Well**
05 - 017 - 06249-00	MUSF #9	☐
05 - 017 - 06273-00	MUSF #10	☐
05 - 017 - 06257-00	MUSF #11	☐
05 - 017 - 06281-00	MUSF #12	☐
05 - 017 - 06283-00	MUSF #13	☐

[5] Requested values will become permit limitations or will be evaluated for exempt status, as applicable, and should consider future process growth. Requested values are required on all APENs, including APEN updates.

[6] The E&P Storage Tank APEN Addendum (Form APCD-212) should be completed and attached when additional space is needed to report all wells that are serviced by the equipment reported on this APEN form.

Section 5 - Geographical/Stack Information

Geographical Coordinates *(Latitude/Longitude or UTM)*
38.86339; -102.90130

☐ Check box if the following information is not applicable to the source because emissions will not be emitted from a stack. If this is the case, the rest of this section may remain blank.

Operator Stack ID No.	Discharge Height Above Ground Level *(Feet)*	Temp. *(°F)*	Flow Rate *(ACFM)*	Velocity *(ft/sec)*
001	20			

Indicate the direction of the stack outlet: *(check one)*

☑ Upward ☐ Downward ☐ Upward with obstructing raincap

☐ Horizontal ☐ Other *(describe)*:

Indicate the stack opening and size: *(check one)*

☑ Circular Interior stack diameter *(inches)*: 12

☐ Square/rectangle Interior stack width *(inches)*: Interior stack depth *(inches)*:

☐ Other *(describe)*:

Permit Number: 02CY0280 AIRS ID Number: 017 / 0005 / 009

[Leave blank unless APCD has already assigned a permit # and AIRS ID]

Section 6 - Control Device Information

☐ Check this box if no emission control equipment or practices are used to reduce emissions, and skip to the next section.

☑ Vapor Recovery Unit (VRU):

Pollutants Controlled: HAPS, VOC's

Size: 10hp Make/Model: Prod Sys/HGF10000

Requested Control Efficiency: 95 %

VRU Downtime or Bypassed (emissions vented): 5 %

☑ Combustion Device:

Pollutants Controlled: HAPS, VOC's

Rating: MMBtu/hr

Type: LEED Make/Model: HOC-24-21

Requested Control Efficiency: 95 %

Manufacturer Guaranteed Control Efficiency: 99 %

Minimum Temperature: UNK Waste Gas Heat Content: 1755 Btu/scf

Constant Pilot Light: ☑ Yes ☐ No Pilot Burner Rating: UNK MMBtu/hr

☐ Closed Loop System

Description of the closed loop system:

☐ Other:

Pollutants Controlled:

Description:

Control Efficiency Requested: %

Section 7 - Gas/Liquids Separation Technology Information (E&P Sites Only)

What is the pressure of the final separator vessel prior to discharge to the storage tank(s)? 22 psig

Describe the separation process between the well and the storage tanks:

3-Phase Separator

Permit Number: 02CY0280 AIRS ID Number: 017 / 0005 / 009

[Leave blank unless APCD has already assigned a permit # and AIRS ID]

Section 8 - Criteria Pollutant Emissions Information

Attach all emissions calculations and emission factor documentation to this APEN form[7].

Is any emission control equipment or practice used to reduce emissions? ☑ Yes ☐ No

If yes, describe the control equipment AND state the requested control efficiencies (report the overall, or combined, values if multiple emission control methods were identified in Section 6):

Pollutant	Control Equipment Description	Overall Requested Control Efficiency *(% reduction in emissions)*
VOC	ECD, VRU	95
NO_X		
CO		
HAPs	ECD, VRU	95
Other:		

From what year is the following reported *actual annual emissions* data? 08/19 - 08/20

Use the following table to report the criteria pollutant emissions from source:

Pollutant	Emission Factor[7]			Actual Annual Emissions		Requested Annual Permit Emission Limit(s)[5]	
	Uncontrolled Basis	Units	Source *(AP-42, Mfg., etc.)*	Uncontrolled Emissions *(tons/year)*	Controlled Emissions[8] *(tons/year)*	Uncontrolled Emissions *(tons/year)*	Controlled Emissions *(tons/year)*
VOC	0.05	#/bbl	Site Specific	1.5	0.1	1.8	0.1
NO_X	0.0980	lb/MMBtu	AP-42	0.1	0.1	0.1	0.1
CO	0.0824	lb/MMBtu	AP-42	0.1	0.1	0.1	0.1

[5] Requested values will become permit limitations or will be evaluated for exempt status, as applicable, and should consider future process growth. Requested values are required on all APENs, including APEN updates.

[7] Attach crude oil laboratory analysis, stack test results, and associated emissions calculations if you are requesting site specific emissions factors according to the guidance in PS Memo 14-03.

[8] Annual emission fees will be based on actual controlled emissions reported. If source has not yet started operating, provide projected emissions.

Section 9 - Non-Criteria Pollutant Emissions Information

Does the emissions source have any uncontrolled actual emissions of non-criteria pollutants (e.g. HAP - hazardous air pollutant) equal to or greater than 250 lbs/year? ☐ Yes ☑ No

If yes, use the following table to report the non-criteria pollutant (HAP) emissions from source:

Chemical Name	Chemical Abstract Service (CAS) Number	Emission Factor[7]			Actual Annual Emissions	
		Uncontrolled Basis	Units	Source *(AP-42, Mfg., etc.)*	Uncontrolled Emissions *(lbs/year)*	Controlled Emissions[8] *(lbs/year)*
Benzene	71432	0.0004	lb/bbl	Site Specific	24.1	1.2
Toluene	108883	0.0004	lb/bbl	Site Specific	18.1	0.9
Ethylbenzene	100414	0.00002	lb/bbl	Site Specific	1.2	0.1
Xylene	1330207	0.0001	lb/bbl	Site Specific	6.0	0.3
n-Hexane	110543	0.0041	lb/bbl	Site Specific	247.0	12.3
2,2,4-Trimethylpentane	540841	0.0001	lb/bbl	Site Specific	6.0	0.3

[7] Attach crude oil laboratory analysis, stack test results, and associated emissions calculations if you are requesting site specific emissions factors according to the guidance in PS Memo 14-03.

[8] Annual emission fees will be based on actual controlled emissions reported. If source has not yet started operating, provide projected emissions.

Permit Number: 02CY0280 AIRS ID Number: 017 / 0005 / 009

[Leave blank unless APCD has already assigned a permit # and AIRS ID]

Section 10 - Applicant Certification

I hereby certify that all information contained herein and information submitted with this application is complete, true, and correct. If this is a registration for coverage under General Permit GP08, I further certify that this source is and will be operated in full compliance with each condition of General Permit GP08.

Signature of Legally Authorized Person (not a vendor or consultant) Date

Name (print) Title

Check the appropriate box to request a copy of the:

☐ Draft permit prior to issuance
☐ Draft permit prior to public notice

(Checking any of these boxes may result in an increased fee and/or processing time)

This emission notice is valid for five (5) years. Submission of a revised APEN is required 30 days prior to expiration of the five-year term, or when a reportable change is made (significant emissions increase, increase production, new equipment, change in fuel type, etc.). See Regulation No. 3, Part A, II.C. for revised APEN requirements.

Send this form along with $216.00 and the General Permit registration fee of $353.13, if applicable, to:

Colorado Department of Public Health and Environment
Air Pollution Control Division
APCD-SS-B1
4300 Cherry Creek Drive South
Denver, CO 80246-1530

Make check payable to:

Colorado Department of Public Health and Environment

For more information or assistance call:

Small Business Assistance Program
(303) 692-3175
OR
(303) 692-3148

APCD Main Phone Number
(303) 692-3150

Crude Oil Storage Tank(s) Emissions Inventory

Section 01 - Administrative Information

Facility AIRs ID:	02CY0280		017-0005-009
	Cheyenne	Plant	Point

Section 02 - Equipment Description Details

Detailed Emissions Unit Description: Emissions From Tank Battery at MUSF#2

Emission Control Device Description: ECD, VRU

Requested Overall VOC & HAP Control Efficiency %: 95.0

Section 03 - Processing Rate Information for Emissions Estimates

Primary Emissions - Storage Tank(s)

Actual Throughput = 60240.7 Barrels (bbl) per year

Requested Permit Limit Throughput = 70000.0 Barrels (bbl) per year Requested Monthly Throughput = 5945.2 Barrels (bbl) per month

Potential to Emit (PTE) Throughput = 75000.0 Barrels (bbl) per year

Secondary Emissions - Combustion Device(s)

Heat content of waste gas = 1755.0 Btu/scf

Volume of waste gas emitted per BBL of liquids produced = 23.0 scf/bbl

Actual heat content of waste gas routed to combustion device = 2,431.6 MMBTU per year

Requested heat content of waste gas routed to combustion device = 2,825.6 MMBTU per year

Potential to Emit (PTE) heat content of waste gas routed to combustion device = 3,027.4 MMBTU per year

Control Device

Pilot Fuel Use Rate:		scfh	0.0 MMscf/yr
Pilot Fuel Gas Heating Value:		Btu/scf	0.0 MMBTU/yr

Section 04 - Emissions Factors & Methodologies

Will this storage tank emit flash emissions? Yes

Emission Factors	Crude Oil Tank		
Pollutant	Uncontrolled (lb/bbl) (Crude Oil Throughput)	Controlled (lb/bbl) (Crude Oil Throughput)	Emission Factor Source
VOC	0.0500	0.0025	Site Specific E.F. (includes flash)
Benzene	0.0004	0.0000	Site Specific E.F. (includes flash)
Toluene	0.0003	0.0000	Site Specific E.F. (includes flash)
Ethylbenzene	0.0000	0.0000	Site Specific E.F. (includes flash)
Xylene	0.0001	0.0000	Site Specific E.F. (includes flash)
n-Hexane	0.0041	0.0002	Site Specific E.F. (includes flash)
224 TMP	0.0001	0.0000	Site Specific E.F. (includes flash)
Pollutant	Control Device Uncontrolled (lb/MMBtu) (Waste Heat Combusted)	Uncontrolled (lb/bbl) (Crude Oil Throughput)	Emission Factor Source
PM10	0.0075	0.0003	AP-42 Table 1.4-2 (PM10/PM.2.5)
PM2.5	0.0075	0.0003	AP-42 Table 1.4-2 (PM10/PM.2.5)
NOx	0.0980	0.0040	AP-42 Table 1.4-1 (NOx)
CO	0.0824	0.0033	AP-42 Table 1.4-1 (CO)
Pollutant	Pilot Light Emissions Uncontrolled (lb/MMBtu) (Waste Heat Combusted)	Uncontrolled (lb/MMscf) (Pilot Gas Throughput)	Emission Factor Source
PM10	0.0075	0.0000	AP-42 Table 1.4-2 (PM10/PM.2.5)
PM2.5	0.0075	0.0000	AP-42 Table 1.4-2 (PM10/PM.2.5)
NOx	0.0980	0.0000	AP-42 Table 1.4-1 (NOx)
CO	0.0824	0.0000	AP-42 Table 1.4-1 (CO)

Crude Oil Storage Tank(s) Emissions Inventory

Section 05 - Emissions Inventory

Criteria Pollutants	Potential to Emit Uncontrolled (tons/year)	Actual Emissions Uncontrolled (tons/year)	Actual Emissions Controlled (tons/year)	Requested Permit Limits Uncontrolled (tons/year)	Requested Permit Limits Controlled (tons/year)	Requested Monthly Limits Controlled (lbs/month)
VOC	1.9	1.5	0.1	1.8	0.1	14.9
PM10	0.0	0.0	0.0	0.0	0.0	1.8
PM2.5	0.0	0.0	0.0	0.0	0.0	1.8
NOx	0.1	0.1	0.1	0.1	0.1	23.5
CO	0.1	0.1	0.1	0.1	0.1	19.8

Hazardous Air Pollutants	Potential to Emit Uncontrolled (lbs/year)	Actual Emissions Uncontrolled (lbs/year)	Actual Emissions Controlled (lbs/year)	Requested Permit Limits Uncontrolled (lbs/year)	Requested Permit Limits Controlled (lbs/year)
Benzene	30.0	24.1	1.2	28.0	1.4
Toluene	22.5	18.1	0.9	21.0	1.1
Ethylbenzene	1.5	1.2	0.1	1.4	0.1
Xylene	7.5	6.0	0.3	7.0	0.4
n-Hexane	307.5	247.0	12.3	287.0	14.4
224 TMP	7.5	6.0	0.3	7.0	0.4

Section 06 - Regulatory Summary Analysis

Regulation 3, Parts A,B	Facility attainment-area status has not been established yet
Regulation 7, Section XVII.B, C.1, C.3	Not enough information
Regulation 7, Section XVII.C.2	Not enough information
Regulation 6, Part A, NSPS Subpart Kb	Not enough information
Regulation 6, Part A, NSPS Subpart OOOO	Not enough information
NSPS Subpart OOOOa	Not enough information
Regulation 8, Part E, MACT Subpart HH	Not enough information

(See regulatory applicability worksheet for detailed analysis)

Section 07 - Initial and Periodic Sampling and Testing Requirements

Does the company use the state default emissions factors to estimate emissions?
If yes, are the uncontrolled actual or requested emissions estimated to be greater than or equal to 20 tons VOC per year?
If yes, the permit will contain an "Initial Compliance" testing requirement to develop a site specific emissions factor based on guidelines in PS Memo 14-03

Does the company use a site specific emissions factor to estimate emissions?

If yes and if there are flash emissions, are the emissions factors based on a pressurized liquid sample of crude oil drawn at the facility being permitted?
If no, the permit will contain an "Initial Compliance" testing requirement to develop a site specific emissions factor based on guidelines in PS Memo 14-03.

Does the company request a control device efficiency greater than 95% for a flare or combustion device?
If yes, the permit will contain and initial compliance test condition to demonstrate the destruction efficiency of the combustion device based on inlet and outlet concentration sampling

Section 08 - Technical Analysis Notes

Section 09 - Inventory SCC Coding and Emissions Factors

AIRS Point #	Process #	SCC Code
#REF!	01	

Pollutant	Uncontrolled Emissions Factor	Control %	Units
PM10	0.01	0	lb/1,000 gallons crude oil throughput
PM2.5	0.01	0	lb/1,000 gallons crude oil throughput
NOx	0.09	0	lb/1,000 gallons crude oil throughput
VOC	1.2	95	lb/1,000 gallons crude oil throughput
CO	0.08	0	lb/1,000 gallons crude oil throughput
Benzene	0.01	95	lb/1,000 gallons crude oil throughput
Toluene	0.01	95	lb/1,000 gallons crude oil throughput
Ethylbenzene	0.00	95	lb/1,000 gallons crude oil throughput
Xylene	0.00	95	lb/1,000 gallons crude oil throughput
n-Hexane	0.10	95	lb/1,000 gallons crude oil throughput
224 TMP	0.00	95	lb/1,000 gallons crude oil throughput

****
* Project Setup Information *
****

Project File : L:\Jay\Backup\Documents\MDC\MUSF T5 permit & Emission Data\EP Tanks for MUSF 2\09301
Flowsheet Selection : Oil Tank with Separator
Calculation Method : AP42
Control Efficiency : 95.0%
Known Separator Stream : Low Pressure Oil
Entering Air Composition : No

Well Name : MUSF #2 Tank Battery
Date : 2015.10.13

****
* Data Input *
****

Separator Pressure : 22.00[psig]
Separator Temperature : 128.00[F]
Ambient Pressure : 12.63[psia]
Ambient Temperature : 72.10[F]
C10+ SG : 0.7750
C10+ MW : 175.43

-- Low Pressure Oil ----------

No.	Component	mol %
1	H2S	0.0000
2	O2	0.0000
3	CO2	0.0270
4	N2	0.0791
5	C1	0.0240
6	C2	0.0771
7	C3	0.5698
8	i-C4	0.2684
9	n-C4	1.4750
10	i-C5	0.9390
11	n-C5	2.3721
12	C6	12.4807
13	C7	18.0049
14	C8	12.1203
15	C9	9.8129
16	C10+	31.5889
17	Benzene	0.6714
18	Toluene	1.5594
19	E-Benzene	0.1330
20	Xylenes	1.4061
21	n-C6	6.0816
22	224Trimethylp	0.3092

-- Sales Oil ----------
Production Rate : 251.1[bbl/day]
Days of Annual Operation : 365 [days/year]
API Gravity : 40.1
Reid Vapor Pressure : 5.60[psia]
Bulk Temperature : 112.00[F]

-- Tank and Shell Data ----------
Diameter : 12.00[ft]
Shell Height : 20.00[ft]
Cone Roof Slope : 0.03
Average Liquid Height : 3.00[ft]
Vent Pressure Range : 0.00[psi]
Solar Absorbance : 0.54

-- Meteorological Data ----------

City : Denver, CO
Ambient Pressure : 12.63[psia]
Ambient Temperature : 72.10[F]
Min Ambient Temperature : 37.20[F]
Max Ambient Temperature : 64.50[F]
Total Solar Insolation : 1501.00[Btu/ft^2*day]

****
* Calculation Results *
****

-- Emission Summary --

Item	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]	Controlled [ton/yr]	Controlled [lb/hr]
Total HAPs	0.230	0.053	0.011	0.003
Total HC	2.241	0.512	0.112	0.026
VOCs, C2+	2.180	0.498	0.109	0.025
VOCs, C3+	2.097	0.479	0.105	0.024

Uncontrolled Recovery Info.
Vapor 147.4500 x1E-3 [MSCFD]
HC Vapor 75.8500 x1E-3 [MSCFD]
GOR 0.59 [SCF/bbl]

-- Emission Composition --

No	Component	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]	Controlled [ton/yr]	Controlled [lb/hr]
1	H2S	0.000	0.000	0.000	0.000
2	O2	0.000	0.000	0.000	0.000
3	CO2	0.080	0.018	0.080	0.018
4	N2	0.915	0.209	0.915	0.209
5	C1	0.061	0.014	0.003	0.001
6	C2	0.083	0.019	0.004	0.001
7	C3	0.298	0.068	0.015	0.003
8	i-C4	0.079	0.018	0.004	0.001
9	n-C4	0.319	0.073	0.016	0.004
10	i-C5	0.106	0.024	0.005	0.001
11	n-C5	0.206	0.047	0.010	0.002
12	C6	0.459	0.105	0.023	0.005
13	C7	0.288	0.066	0.014	0.003
14	C8	0.080	0.018	0.004	0.001
15	C9	0.028	0.006	0.001	0.000
16	C10+	0.006	0.001	0.000	0.000
17	Benzene	0.017	0.004	0.001	0.000
18	Toluene	0.015	0.003	0.001	0.000
19	E-Benzene	0.001	0.000	0.000	0.000
20	Xylenes	0.005	0.001	0.000	0.000
21	n-C6	0.186	0.042	0.009	0.002
22	224Trimethylp	0.005	0.001	0.000	0.000
	Total	3.237	0.739	0.162	0.037

-- Stream Data --

No.	Component	MW	LP Oil mol %	Flash Oil mol %	Sale Oil mol %	Flash Gas mol %	W&S Gas mol %	Total Emissions mol %
1	H2S	34.80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	O2	32.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	CO2	44.01	0.0270	0.0270	0.0253	0.0000	2.5508	2.5508
4	N2	28.01	0.0791	0.0791	0.0481	0.0000	46.0100	46.0100
5	C1	16.04	0.0240	0.0240	0.0204	0.0000	5.3308	5.3308
6	C2	30.07	0.0771	0.0771	0.0745	0.0000	3.9025	3.9025
7	C3	44.10	0.5698	0.5698	0.5638	0.0000	9.5024	9.5024
8	i-C4	58.12	0.2684	0.2684	0.2673	0.0000	1.9249	1.9249
9	n-C4	58.12	1.4750	1.4750	1.4708	0.0000	7.7229	7.7229
10	i-C5	72.15	0.9390	0.9390	0.9382	0.0000	2.0657	2.0657
11	n-C5	72.15	2.3721	2.3721	2.3710	0.0000	4.0286	4.0286
12	C6	86.16	12.4807	12.4807	12.4839	0.0000	7.6982	7.6982
13	C7	100.20	18.0049	18.0049	18.0142	0.0000	4.1795	4.1795

14	C8	114.23	12.1203	12.1203	12.1278	0.0000	1.0107	1.0107
15	C9	128.28	9.8129	9.8129	9.8193	0.0000	0.3199	0.3199
16	C10+	175.43	31.5889	31.5889	31.6102	0.0000	0.0498	0.0498
17	Benzene	78.11	0.6714	0.6714	0.6716	0.0000	0.3054	0.3054
18	Toluene	92.13	1.5594	1.5594	1.5603	0.0000	0.2283	0.2283
19	E-Benzene	106.17	0.1330	0.1330	0.1331	0.0000	0.0072	0.0072
20	Xylenes	106.17	1.4061	1.4061	1.4070	0.0000	0.0677	0.0677
21	n-C6	86.18	6.0816	6.0816	6.0837	0.0000	3.0376	3.0376
22	224Trimethylp	114.24	0.3092	0.3092	0.3094	0.0000	0.0573	0.0573
	MW		121.66	121.66	121.66	0.00	45.57	45.57
	Stream Mole Ratio		1.0000	1.0000	0.9993	0.0000	0.0007	0.0007
	Heating Value	[BTU/SCF]				0.00	1755.05	1755.05
	Gas Gravity	[Gas/Air]				0.00	1.57	1.57
	Bubble Pt. @ 100F	[psia]	13.20	13.20	10.18			
	RVP @ 100F	[psia]	34.49	34.49	33.65			
	Spec. Gravity @ 100F		0.694	0.694	0.694			

EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

E & P TANK / GLYCALC INFORMATION

PROJECT NO. :	201511044	ANALYSIS NO. :	01
COMPANY NAME :	MULL DRILLING COMPANY INC	ANALYSIS DATE:	NOVEMBER 06, 2015 17:07
ACCOUNT NO. :		SAMPLE DATE :	NOVEMBER 02, 2015 11:45
PRODUCER :		CYLINDER NO. :	5041
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	MUSF #2 TB		EMPACT
FIELD DATA		SAMPLE TEMP. :	128.0
SAMPLE PRES. :	22.0	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE; REQUIRED BY CARL SMALLEY FOR POSSIBLE ANALYSIS CORRECTION		

COMPONENT	Mole %		Wt %		LV %	
CARBON DIOXIDE	0.0270		0.0097		0.0089	
NITROGEN (AIR)	0.0790		0.0180		0.0166	
METHANE	0.0240		0.0031		0.0077	
ETHANE	0.0770		0.0188		0.0394	
PROPANE	0.5690		0.2042		0.3009	
I-BUTANE	0.2680		0.1267		0.1682	
N-BUTANE	1.4730		0.6966		0.8913	
I-PENTANE	0.9377		0.5505		0.6590	
N-PENTANE	1.6430		0.9646		1.1420	
CYCLOPENTANE (N-C5)	0.7259		0.4142		0.4071	
N-HEXANE	6.0733		4.2594		4.7959	
CYCLOHEXANE (OTHER C6)	3.6890		2.5262		2.4093	
OTHER HEXANES	8.7748		6.1003		6.5641	
OTHER HEPTANES	12.1736		9.8734		10.4197	
METHYLCYCLOHEXANE (OTHER C7)	5.8069		4.6395		4.4748	
2,2,4 TRIMETHYLPENTANE	0.3088		0.2870		0.3067	
BENZENE	0.6705		0.4262		0.3607	
TOLUENE	1.5573		1.1676		0.9979	
ETHYLBENZENE	0.1328		0.1147		0.0980	
XYLENES	1.4042		1.2131		1.0375	
OTHER OCTANES	12.1039		11.1575		11.2686	
OCTANES PLUS	----	55.2953	----	67.9647	----	66.3024
NONANES	9.7996		10.1631		10.1912	
DECANES PLUS	31.5460		45.0293		43.4004	
SUB TOTAL	99.8643		99.9637		99.9659	
ALCOHOLS	0.1357		0.0363		0.0341	
TOTAL	100.0000		100.0000		100.0000	

API Gravity	=	57.77	60/60
Vapor Pressure	=	5.76	PSIA & 100 F
Average Molecular Weight of Decanes plus	=	175.43	
Average Specific Gravity of Decanes plus	=	0.7750	

CRUDE OIL ASSAY

PROJECT NO. :	201511044	ANALYSIS NO. :	02
COMPANY NAME :	MULL DRILLING COMPANY INC	ANALYSIS DATE:	NOV. 12, 2015
ACCOUNT NO. :		SAMPLE DATE :	NOV. 02, 2015 12:50
PRODUCER :		CYLINDER NO. :	1L GLASS
LEASE NO. :		SAMPLED BY :	JOHN MOSER EMPACT
NAME/DESCRIP :	MUSF #2 TB		
FIELD DATA		SAMPLE TEMP. :	112.0
SAMPLE PRES. :		AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	REQUIRED BY CARL SMALLEY FOR POSSIBLE ANALYSIS CORRECTION		

SPECIFICATION		TEST METHOD	UNITS	RESULTS
API GRAVITY			API 60/60	40.1
RVP @100 DEG F		D323	PSIG	5.6
TOTAL SULFUR		D2622	WT %	N/A
TOTAL CHLORIDE		D4929	ug/g	N/A
ORGANIC CHLORIDE		D4929	ug/g	N/A
FLASH POINT		D93	° F	N/A
HEATING VALUE		D4809	BTU/ LB	N/A
VISUAL APPEARANCE				BLACK
BS&W		D96		
Crude Oil			VOL %	N/A
Water			VOL %	N/A
Emulsion			VOL %	N/A
Sediment			VOL %	N/A
DISTILLATION:		D86		
INITIAL POINT			DEG F	N/A
50%			DEG F	N/A
90%			DEG F	N/A
END POINT			DEG F	N/A
DISTILLATION:	@TEMP	D445		
Average Centipoise	20°C			N/A
Average Centipoise	30°C			N/A
Average Centipoise	80°C			N/A
Kinetic Viscosity	20°C		cSt (mm2/s)	N/A
Kinetic Viscosity	30°C		cSt (mm2/s)	N/A
Kinetic Viscosity	80°C		cSt (mm2/s)	N/A

ND: NOT DETECTED

N/A: NO TEST PREFORMED FOR THIS PARAMETER

EMPACT

NATURAL GAS ANALYSIS

PRIMARY DB KEY:		NAME/DESCRIP :	MUSF 9
LEASE #:			CASING GAS
FIELD/ AREA:	MUSF		
PROJECT NO. :	201903031	ANALYSIS NO. :	01
COMPANY NAME :	MULL DRILLING COMPANY INC	ANALYSIS DATE:	MARCH 06, 2019 13:55
OFFICE / BRANCH:	CHEYENNE WELLS, CO	SAMPLE DATE :	FEBRUARY 26, 2019
CUSTOMER REF:		TO:	
PRODUCER :		EFFECTIVE DATE:	
FIELD DATA			
SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	14 psig	PROBE :	NO
FLOW PRES. :	psig	CYLINDER NO. :	1810
LAB PRES:	psig	SAMPLED BY :	BILL STUTZ
SAMPLE TEMP. :	50 °f	SAMPLING COMPANY:	MULL
AMBIENT TEMP.:	°f	H2S BY STAIN TUBE:	- ppm
H2O BY STAIN TUBE	- #/mmcf	CO2 BY STAIN TUBE:	- Mol %
FIELD COMMENTS:			
LAB COMMENTS:			

COMPONENTS	NORM. MOLE%	GPM @ 14.65	GPM @ 14.73
HELIUM	0.04	-	-
HYDROGEN	0.03	-	-
OXYGEN/ARGON	0.67	-	-
NITROGEN	89.70	-	-
CO2	1.39	-	-
METHANE	1.90	-	-
ETHANE	0.83	0.2205	0.2217
PROPANE	1.17	0.3212	0.3230
ISOBUTANE	0.25	0.0818	0.0822
N-BUTANE	1.05	0.3292	0.3310
ISOPENTANE	0.42	0.1526	0.1535
N-PENTANE	0.93	0.3352	0.3370
HEXANES+	1.62	0.6993	0.7031
TOTAL	100.00	2.1398	2.1515

BTU @ 60 DEG F	14.65		14.73	
GROSS DRY REAL =	242.5	/scf	243.8	/scf
GROSS SATURATED REAL =	238.3	/scf	239.6	/scf

RELATIVE DENSITY (AIR=1 @14.696 PSIA 60F)	1.0451
GRAVITY (LB/SCF)	0.07976
COMPRESSIBILITY FACTOR :	0.99928

NOTE: REFERENCE GPA 2261(ASTM D1945 & ASME-PTC), 2145, & 2172 CURRENT PUBLICATIONS

Reference: Per GPA 2172-14 sec 9

The C6+ is derived from the following ratios of C6, C7 & C8+ respectively: **60% 30% 10%**

EMPACT

NATURAL GAS ANALYSIS

PRIMARY DB KEY:		NAME/DESCRIP :	MUSF 10
LEASE #:			CASING GAS
FIELD/ AREA:	MUSF		
PROJECT NO. :	201903031	ANALYSIS NO. :	02
COMPANY NAME :	MULL DRILLING COMPANY INC	ANALYSIS DATE:	MARCH 06, 2019 14:20
OFFICE / BRANCH:	CHEYENNE WELLS, CO	SAMPLE DATE :	FEBRUARY 26, 2019
CUSTOMER REF:		TO:	
PRODUCER :		EFFECTIVE DATE:	
FIELD DATA			
SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	psig	PROBE :	NO
FLOW PRES. :	psig	CYLINDER NO. :	1097
LAB PRES:	psig	SAMPLED BY :	BILL STUTZ
SAMPLE TEMP. :	50 °f	SAMPLING COMPANY:	MULL
AMBIENT TEMP.:	°f	H2S BY STAIN TUBE:	- ppm
H2O BY STAIN TUBE	- #/mmcf	CO2 BY STAIN TUBE:	- Mol %
FIELD COMMENTS:			
LAB COMMENTS:			

COMPONENTS	NORM. MOLE%	GPM @ 14.65	GPM @ 14.73
HELIUM	0.15	-	-
HYDROGEN	0.01	-	-
OXYGEN/ARGON	0.49	-	-
NITROGEN	62.41	-	-
CO2	1.58	-	-
METHANE	7.83	-	-
ETHANE	4.87	1.2990	1.3061
PROPANE	8.48	2.3300	2.3427
ISOBUTANE	1.47	0.4800	0.4826
N-BUTANE	5.48	1.7230	1.7324
ISOPENTANE	1.59	0.5800	0.5832
N-PENTANE	2.23	0.8060	0.8104
HEXANES+	3.41	1.4760	1.4840
TOTAL	100.00	8.6940	8.7414

BTU @ 60 DEG F		14.65		14.73	
	GROSS DRY REAL =	933.3	/scf	938.4	/scf
	GROSS SATURATED REAL =	917.0	/scf	922.1	/scf

RELATIVE DENSITY (AIR=1 @14.696 PSIA 60F)	1.2007
GRAVITY (LB/SCF)	0.09164
COMPRESSIBILITY FACTOR :	0.99689

NOTE: REFERENCE GPA 2261(ASTM D1945 & ASME-PTC), 2145, & 2172 CURRENT PUBLICATIONS

Reference: Per GPA 2172-14 sec 9

The C6+ is derived from the following ratios of C6, C7 & C8+ respectively: **60% 30% 10%**

EMPACT

NATURAL GAS ANALYSIS

PRIMARY DB KEY:		NAME/DESCRIP :	MUSF 11
LEASE #:			CASING GAS
FIELD/ AREA:	MUSF		
PROJECT NO. :	201903031	ANALYSIS NO. :	04
COMPANY NAME :	MULL DRILLING COMPANY INC	ANALYSIS DATE:	MARCH 06, 2019 15:08
OFFICE / BRANCH:	CHEYENNE WELLS, CO	SAMPLE DATE :	FEBRUARY 26, 2019
CUSTOMER REF:		TO:	
PRODUCER :		EFFECTIVE DATE:	
FIELD DATA			
SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	20 psig	PROBE :	NO
FLOW PRES. :	psig	CYLINDER NO. :	1082
LAB PRES:	psig	SAMPLED BY :	BILL STUTZ
SAMPLE TEMP. :	50 °f	SAMPLING COMPANY:	MULL
AMBIENT TEMP.:	°f	H2S BY STAIN TUBE:	- ppm
H2O BY STAIN TUBE:	- #/mmcf	CO2 BY STAIN TUBE:	- Mol %
FIELD COMMENTS:			
LAB COMMENTS:			

COMPONENTS	NORM. MOLE%	GPM @ 14.65	GPM @ 14.73
HELIUM	0.03	-	-
HYDROGEN	0.02	-	-
OXYGEN/ARGON	0.67	-	-
NITROGEN	90.85	-	-
CO2	1.40	-	-
METHANE	1.56	-	-
ETHANE	0.77	0.2045	0.2056
PROPANE	0.91	0.2494	0.2507
ISOBUTANE	0.11	0.0359	0.0361
N-BUTANE	0.37	0.1157	0.1163
ISOPENTANE	0.14	0.0509	0.0511
N-PENTANE	0.25	0.0898	0.0903
HEXANES+	2.92	1.2608	1.2676
TOTAL	100.00	2.0070	2.0177

BTU @ 60 DEG F		14.65		14.73	
	GROSS DRY REAL =	232.9	/scf	234.2	/scf
	GROSS SATURATED REAL =	228.8	/scf	230.1	/scf

RELATIVE DENSITY (AIR=1 @14.696 PSIA 60F)	1.0512
GRAVITY (LB/SCF)	0.08023
COMPRESSIBILITY FACTOR :	0.99943

NOTE: REFERENCE GPA 2261(ASTM D1945 & ASME-PTC), 2145, & 2172 CURRENT PUBLICATIONS

Reference: Per GPA 2172-14 sec 9

The C6+ is derived from the following ratios of C6, C7 & C8+ respectively: **60% 30% 10%**

EMPACT

NATURAL GAS ANALYSIS

PRIMARY DB KEY:		NAME/DESCRIP :	MUSF 12
LEASE #:			CASING GAS
FIELD/ AREA:	MUSF		
PROJECT NO. :	201903031	ANALYSIS NO. :	09
COMPANY NAME :	MULL DRILLING COMPANY INC	ANALYSIS DATE:	MARCH 06, 2019 15:07
OFFICE / BRANCH:	CHEYENNE WELLS, CO	SAMPLE DATE :	FEBRUARY 26, 2019
CUSTOMER REF:		TO:	
PRODUCER :		EFFECTIVE DATE:	
FIELD DATA			
SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	30 psig	PROBE :	NO
FLOW PRES. :	psig	CYLINDER NO. :	1795
LAB PRES:	psig	SAMPLED BY :	BILL STUTZ
SAMPLE TEMP. :	50 °f	SAMPLING COMPANY:	MULL
AMBIENT TEMP.:	°f	H2S BY STAIN TUBE:	- ppm
H2O BY STAIN TUBE:	- #/mmcf	CO2 BY STAIN TUBE:	- Mol %
FIELD COMMENTS:			
LAB COMMENTS:			

COMPONENTS	NORM. MOLE%	GPM @ 14.65	GPM @ 14.73
HELIUM	0.11	-	-
HYDROGEN	0.00	-	-
OXYGEN/ARGON	0.61	-	-
NITROGEN	79.64	-	-
CO2	1.69	-	-
METHANE	6.18	-	-
ETHANE	3.07	0.8173	0.8218
PROPANE	3.78	1.0369	1.0425
ISOBUTANE	0.47	0.1527	0.1535
N-BUTANE	1.49	0.4680	0.4706
ISOPENTANE	0.29	0.1058	0.1064
N-PENTANE	0.36	0.1297	0.1304
HEXANES+	2.31	0.9979	1.0034
TOTAL	100.00	3.7083	3.7286

BTU @ 60 DEG F		14.65		14.73	
	GROSS DRY REAL =	419.2	/scf	421.5	/scf
	GROSS SATURATED REAL =	411.9	/scf	414.2	/scf

RELATIVE DENSITY (AIR=1 @14.696 PSIA 60F)	1.0564
GRAVITY (LB/SCF)	0.08062
COMPRESSIBILITY FACTOR :	0.99893

NOTE: REFERENCE GPA 2261(ASTM D1945 & ASME-PTC), 2145, & 2172 CURRENT PUBLICATIONS

Reference: Per GPA 2172-14 sec 9

The C6+ is derived from the following ratios of C6, C7 & C8+ respectively: **60% 30% 10%**

EMPACT

NATURAL GAS ANALYSIS

PRIMARY DB KEY:		NAME/DESCRIP :	MUSF 13 CASING GAS
LEASE #:			
FIELD/ AREA:	MUSF		
PROJECT NO. :	201903031	ANALYSIS NO. :	12
COMPANY NAME :	MULL DRILLING COMPANY INC	ANALYSIS DATE:	MARCH 06, 2019 13:55
OFFICE / BRANCH:	CHEYENNE WELLS, CO	SAMPLE DATE :	FEBRUARY 26, 2019
CUSTOMER REF:		TO:	
PRODUCER :		EFFECTIVE DATE:	
FIELD DATA			
SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	28 psig	PROBE :	NO
FLOW PRES. :	psig	CYLINDER NO. :	0897
LAB PRES:	psig	SAMPLED BY :	BILL STUTZ
SAMPLE TEMP. :	50 °f	SAMPLING COMPANY:	MULL
AMBIENT TEMP.:	°f	H2S BY STAIN TUBE:	- ppm
H2O BY STAIN TUBE:	- #/mmcf	CO2 BY STAIN TUBE:	- Mol %
FIELD COMMENTS:	*Well has not pumped for 10 days.*		
LAB COMMENTS:			

COMPONENTS	NORM. MOLE%	GPM @ 14.65	GPM @ 14.73
HELIUM	0.12	-	-
HYDROGEN	0.21	-	-
OXYGEN/ARGON	0.60	-	-
NITROGEN	77.54	-	-
CO2	1.69	-	-
METHANE	6.14	-	-
ETHANE	3.18	0.8465	0.8511
PROPANE	4.39	1.2038	1.2104
ISOBUTANE	0.65	0.2116	0.2128
N-BUTANE	2.26	0.7097	0.7136
ISOPENTANE	0.62	0.2256	0.2268
N-PENTANE	0.91	0.3284	0.3302
HEXANES+	1.69	0.7297	0.7337
TOTAL	100.00	4.2553	4.2786

BTU @ 60 DEG F		14.65		14.73	
	GROSS DRY REAL =	471.3	/scf	473.9	/scf
	GROSS SATURATED REAL =	463.1	/scf	465.7	/scf

RELATIVE DENSITY (AIR=1 @14.696 PSIA 60F)	1.0673
GRAVITY (LB/SCF)	0.08146
COMPRESSIBILITY FACTOR :	0.99867

NOTE: REFERENCE GPA 2261(ASTM D1945 & ASME-PTC), 2145, & 2172 CURRENT PUBLICATIONS

Reference: Per GPA 2172-14 sec 9 *The C6+ is derived from the following ratios of C6, C7 & C8+ respectively:* **60% 30% 10%**