



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

January 8, 2022

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

**RE:**

***Form 4 Sundry Submittal  
Braukmann Farms C#1 Gas Capture Plan  
API# 05-073-06106 – COGCC ID# 218121  
COGCC DocNum #402920996***

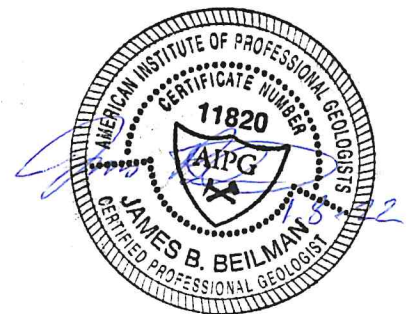
To whom it may concern:

In this ***Form 4 Sundry*** Submittal you will find the Gas Capture Plan from Mull Drilling Company, Inc. (Mull) for the Braukmann Farms Crude Oil Tank Battery and associated equipment (API# 05-073-06106 – COGCC ID# 218121). 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,

A handwritten signature in black ink that reads "James Beilman".

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



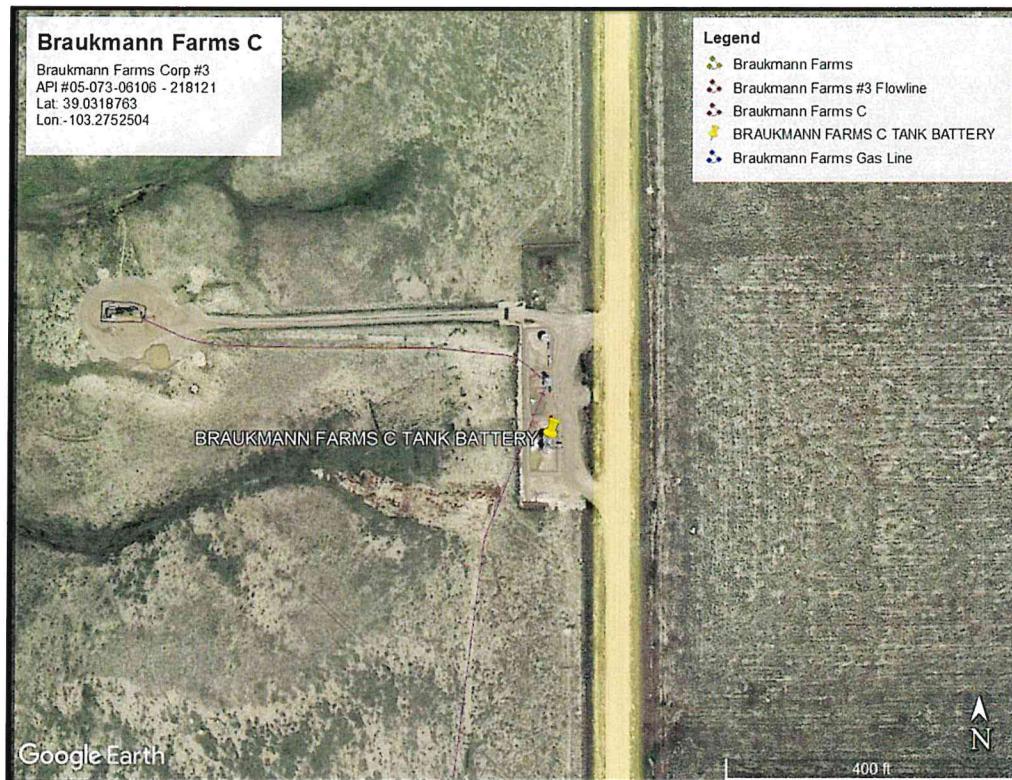


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**Braukmann Farms C Crude Oil Tank Battery**  
**05-073-06106 - 218121**  
**CDPHE Permit Number 12LI1869 AIRS ID 073-0089-001**  
**SEWS1, T12S, R53W**  
**Lincoln County, Colorado**

***GAS CAPTURE PLAN***

**Site Map**

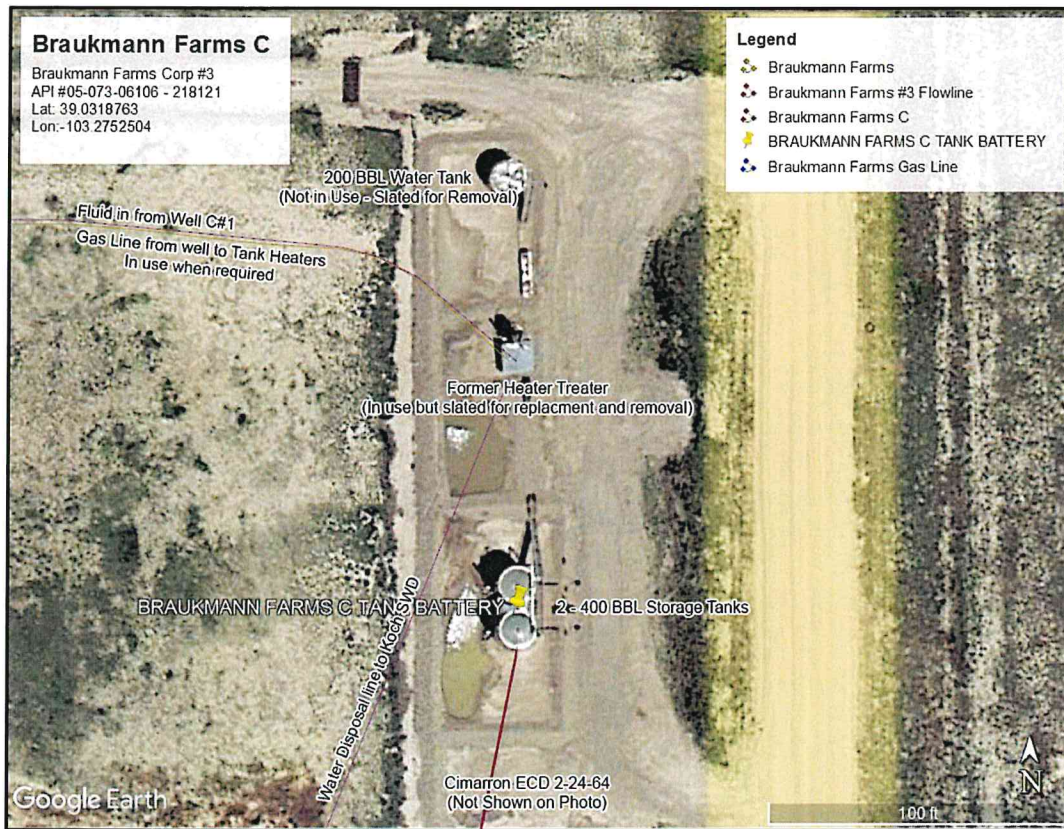


Mull Drilling Company., Inc. (Mull) has drafted this plan to comply with Rules 903.d and 903.e.(1).B. The Braukmann Farms C#1 Tank Battery and Braukmann Farms Corp. C#1 well were constructed in 1983. They consist of the consolidated production facilities for 1 - operated well; the location contains a, 2 (400 bbl – Total 800 bbl total) oil storage tanks, 1 200 bbl produced water tank (Slated for Removal), 1 Heater Treater, and 1 Cimarron ECD 2-24-64 ECD. Produced water is disposed to the Koch SWD.

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The Heater Treater is currently only functioning as a water knockout with no supplied gas for heating purposes: it is slated for replacement with a traditional water knockout. The well is powered via an electrical motor. This is not a request to Vent or Flare.

### Flow Diagram



<p><b>903.d:</b> Emissions During Production</p>	<p>Gas at this facility has dropped off significantly during its production. Currently, any available gas is piped to the tanks and burned for beneficial reuse if available, which is not the case at this time. Otherwise the gas is currently routed to the ECD for final combustion.</p>
<p><b>903.e.(1).B.i:</b> Description of the Closest Gas Gathering System</p>	<p>No Gas available to sell after beneficial reuse/use on lease.</p>

<p><b>903. e.(1).B.ii:</b>          Company operating the closest Gas Gathering System</p>	<p>NA</p>
<p><b>903. e.(1).B.iv:</b>          Production Test Plans</p>	<p>The Original Production Test and analytical are supplied. 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.</p>
<p><b>903. e.(1).B.v:</b>          Safety Risks</p>	<p>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.</p>
<p><b>903. e.(1).B.vi:</b>          Operational BMPs</p>	<p>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:</p> <p>During maintenance activities, Mull will have appropriate gas control equipment on location to minimize all Venting.</p> <p>All facilities maintain a rigorous LDAR Program. In this case, The Meteor Unit TB is checked semi-annually for leaks and verified (when necessary) with a PID/FID approved by the CDPHE and the COGCC.</p> <p>All tanks have sight glasses for visual inspection of fluids during daily gauging events.</p> <p>All Wells have pressure/trip Murphy switches that will shutdown the well in the event of a leak.</p> <p>Flowback controls have been installed for all liquids unloading events.</p>
<p><b>903. e.(1).B.vii:</b>          Procedures to reduce well liquids unloading events</p>	<p>Mull anticipates Well Liquid Unloading events as required for sales. Flowback controls have been installed at this location to send emitted gases to the tanks and then the combustor.</p>
<p><b>903. e.(1).B.viii:</b>          Anticipated volumes of liquids and gas production</p>	<p>Current well production displays negligible gas production. As displayed by Mulls latest APEN, Liquids production is anticipated to not exceed 6000 bbl per year. The 12 month rolling total from October 2021 is 5038 bbl (flash gas of approximately 4.00 tpy VOC's) As stated, flow back controls are installed on this tank battery.</p>



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A red ink stamp consisting of a blue folder icon to the left of the word "COPY" in a bold, sans-serif font.

February 16<sup>th</sup>, 2021

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

**RE:**

*Braukmann Farms C Crude Oil Tank Battery*

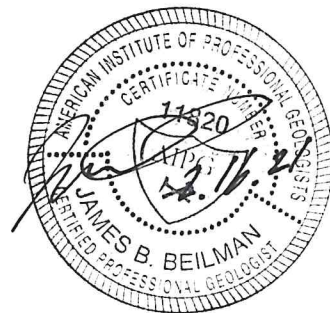
To whom it may concern:

Enclosed you will find the submittal for the Braukmann Farms C Crude Oil Tank Battery. Rolling- Emissions are at 3.37 tpy. Installation of a Cimarron CEI-1-24 is pending this month. For calculations we utilized the APCD workbook and E&P Tank v.3.0 but used the former when filling out the forms. Copies of workbooks are supplied in regards to this model.

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

A handwritten signature in black ink, appearing to read "James Beilman", with a long horizontal flourish extending to the right.

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



 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: 12LI1869

AIRS ID Number: 073 / 0089 / 001

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

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## Section 1 - Administrative Information

Company Name<sup>1</sup>: Mull Drilling Company

Site Name: Braukmann Farms C Crude Oil Tank Battery

Site Location: SENE S1, T12S, R53W

Site Location  
County: Lincoln

NAICS or SIC Code: 1311

Mailing Address:  
(Include Zip Code) 1700 N Waterfront Parkway, Building 1200  
Wichita, KS 67206

Contact Person: James Beilman

Phone Number: 316-264-6366

E-Mail Address<sup>2</sup>: jbeilman@mulldrilling.com

<sup>1</sup> 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.

<sup>2</sup> Permits, exemption letters, and any processing invoices will be issued by the APCD via e-mail to the address provided.

Permit Number: 12L11869

AIRS ID Number: 073 / 0089 / 001

[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<sup>3</sup>
  - Change permit limit                       Transfer of ownership<sup>4</sup>                       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: Addition of Air Pollution Control Equipment.

12-Month Rolling average is at 3.37 tpy. Installation of Cimarron CEI-1-24

<sup>3</sup> For company name change, a completed Company Name Change Certification Form (Form APCD-106) must be submitted.

<sup>4</sup> 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): 2/15/83

For existing sources, operation began on: \_\_\_\_\_

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?	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
Are Flash Emissions anticipated from these storage tanks?	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No
Are these storage tanks subject to Colorado Oil and Gas Conservation Commission (COGCC) 805 series rules? If so, submit Form APCD-105.	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
Are you requesting ≥ 6 ton/yr VOC emissions (per storage tank), or are uncontrolled actual emissions ≥ 6 ton/yr (per storage tank)?	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No

Permit Number: **12L11869**

AIRS ID Number: **073 / 0089 / 001**

[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 <sup>5</sup> (bbl/year)
Crude Oil Throughput:	5604.99	6000

From what year is the *actual annual* amount? Nov 2019 - Nov 2020

Average API gravity of sales oil: 37.36 degrees RVP of sales oil: 3.60

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	2	400	10/5/07	2/15/83

Wells Serviced by this Storage Tank or Tank Battery <sup>6</sup> (E&P Sites Only)		
API Number	Name of Well	Newly Reported Well
05 - 0730 - 06160	Braukmann Farms C #1	<input type="checkbox"/>
- -		<input type="checkbox"/>
- -		<input type="checkbox"/>
- -		<input type="checkbox"/>
- -		<input type="checkbox"/>

<sup>5</sup> 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.

<sup>6</sup> 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)
39.0318763; -103.2752504

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	10			

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): 24"  
 Square/rectangle Interior stack width (inches): \_\_\_\_\_ Interior stack depth (inches): \_\_\_\_\_  
 Other (describe): \_\_\_\_\_

Permit Number: 12L1869

AIRS ID Number: 073 / 0089 / 001

[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.

Pollutants Controlled: _____	
<input type="checkbox"/> Vapor Recovery Unit (VRU):	Size: _____ Make/Model: _____
	Requested Control Efficiency: _____ %
	VRU Downtime or Bypassed (emissions vented): _____ %

Pollutants Controlled: <u>VOC's, HAPS</u>	
Rating: <u>1.6</u> MMBtu/hr	
Type: <u>Cimarron</u> Make/Model: <u>Cimarron CEI-1-24</u>	
<input checked="" type="checkbox"/> Combustion Device:	Requested Control Efficiency: <u>95</u> %
	Manufacturer Guaranteed Control Efficiency: <u>99</u> %
Minimum Temperature: <u>ukn</u>	Waste Gas Heat Content: <u>2300</u> Btu/scf
Constant Pilot Light: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Pilot Burner Rating: <u>ukn</u> MMBtu/hr

Description of the closed loop system: _____	
<input type="checkbox"/> Closed Loop System	_____
	_____
	_____

Pollutants Controlled: _____	
<input type="checkbox"/> Other:	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)? 56 psig

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

Two Phase Separator

Permit Number: **12L11869**

AIRS ID Number: **073 / 0089 / 001**

[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<sup>7</sup>.

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	95%
NO <sub>x</sub>		
CO		
HAPs	ECD	95%
Other:		

From what year is the following reported *actual annual emissions* data? Nov 2019 - Nov 2020

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

Pollutant	Emission Factor <sup>7</sup>			Actual Annual Emissions		Requested Annual Permit Emission Limit(s) <sup>5</sup>	
	Uncontrolled Basis	Units	Source (AP-42, Mfg., etc.)	Uncontrolled Emissions (tons/year)	Controlled Emissions <sup>8</sup> (tons/year)	Uncontrolled Emissions (tons/year)	Controlled Emissions (tons/year)
VOC	1.2035	lbs/bbl	Site Specific	3.4	0.2	3.6	0.2
NO <sub>x</sub>	0.0980	lb/MMBtu	AP-42 APCD	0.0	0.0	0.0	0.0
CO	0.0824	lb7MMBtu	AP-42 APCD	0.0	0.0	0.0	0.0

<sup>5</sup> 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.

<sup>7</sup> 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.

<sup>8</sup> 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 <sup>7</sup>			Actual Annual Emissions	
		Uncontrolled Basis	Units	Source (AP-42, Mfg., etc.)	Uncontrolled Emissions (lbs/year)	Controlled Emissions <sup>8</sup> (lbs/year)
Benzene	71432	0.0114	lb/bbl	Site Specific	64.0	3.2
Toluene	108883	0.0057	lb/bbl	Site Specific	31.9	1.6
Ethylbenzene	100414	0.0004	lb/bbl	Site Specific	2.0	0.1
Xylene	1330207	0.0029	lb/bbl	Site Specific	16.0	0.8
n-Hexane	110543	0.1399	lb/bbl	Site Specific	784.0	39.2
2,2,4-Trimethylpentane	540841	0.0096	lb/bbl	Site Specific	54.0	2.7

<sup>7</sup> 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.

<sup>8</sup> Annual emission fees will be based on actual controlled emissions reported. If source has not yet started operating, provide projected emissions.

Permit Number: 12L11869

AIRS ID Number: 073 /0089/001

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



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**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.

*Jennifer Mull*

*2/16/21*

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

Date

*Jennifer Mull*

*CEO*

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

For more information or assistance call:

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

APCD Main Phone Number  
(303) 692-3150

Make check payable to:

Colorado Department of Public Health and Environment

Crude Oil Storage Tank(s) Emissions Inventory



Section 01 - Administrative Information

Facility AIRs ID:	09CY1360.XP	017-0254-002
	Cheyenne	NWAU #3 Point

Section 02 - Equipment Description Details

Detailed Emissions Unit Description: Braukmann Farms C Tank Battery

Emission Control Device Description: Install of Cimarron CEI\_24 Combustor

Requested Overall VOC & HAP Control Efficiency %: 95.0

Section 03 - Processing Rate Information for Emissions Estimates

Primary Emissions - Storage Tank(s)

Actual Throughput =	5605.0 Barrels (bbl) per year		
Requested Permit Limit Throughput =	6000.0 Barrels (bbl) per year	Requested Monthly Throughput =	509.6 Barrels (bbl) per month

Potential to Emit (PTE) Throughput = 6500.0 Barrels (bbl) per year

Secondary Emissions - Combustion Device(s)

Heat content of waste gas = 2300.0 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 = 295.5 MMBTU per year  
 Requested heat content of waste gas routed to combustion device = 317.4 MMBTU per year  
 Potential to Emit (PTE) heat content of waste gas routed to combustion device = 343.9 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		Emission Factor Source
	Uncontrolled	Controlled	
	(lb/bbl) (Crude Oil Throughput)	(lb/bbl) (Crude Oil Throughput)	
VOC	1.2035	0.0602	Site Specific E.F. (Includes flash)
Benzene	0.0114	0.0006	Site Specific E.F. (Includes flash)
Toluene	0.0057	0.0003	Site Specific E.F. (Includes flash)
Ethylbenzene	0.0004	0.0000	Site Specific E.F. (Includes flash)
Xylene	0.0029	0.0001	Site Specific E.F. (Includes flash)
n-Hexane	0.1399	0.0070	Site Specific E.F. (Includes flash)
224 TMP	0.0096	0.0005	Site Specific E.F. (Includes flash)
Emission Factors	Control Device		Emission Factor Source
	Uncontrolled	Uncontrolled	
	(lb/MMBtu) (Waste Heat Combusted)	(lb/bbl) (Crude Oil Throughput)	
PM10	0.0075	0.0004	AP-42 Table 1.4-2 (PM10/PM2.5)
PM2.5	0.0075	0.0004	AP-42 Table 1.4-2 (PM10/PM2.5)
NOx	0.0980	0.0052	AP-42 Table 1.4-1 (NOx)
CO	0.0824	0.0044	AP-42 Table 1.4-1 (CO)
Emission Factors	Pilot Light Emissions		Emission Factor Source
	Uncontrolled	Uncontrolled	
	(lb/MMBtu) (Waste Heat Combusted)	(lb/MMscf) (Pilot Gas Throughput)	
PM10	0.0075	0.0000	AP-42 Table 1.4-2 (PM10/PM2.5)
PM2.5	0.0075	0.0000	AP-42 Table 1.4-2 (PM10/PM2.5)
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 (tons/year)		Requested Permit Limits (tons/year)		Requested Monthly Limits Controlled (lbs/month)
		Uncontrolled	Controlled	Uncontrolled	Controlled	
VOC	3.3	3.4	0.2	3.6	0.2	30.7
PM10	0.0	0.0	0.0	0.0	0.0	0.2
PM2.5	0.0	0.0	0.0	0.0	0.0	0.2
NOx	0.0	0.0	0.0	0.0	0.0	2.6
CO	0.0	0.0	0.0	0.0	0.0	2.2
Hazardous Air Pollutants	Potential to Emit Uncontrolled (lbs/year)	Actual Emissions (lbs/year)		Requested Permit Limits (lbs/year)		
		Uncontrolled	Controlled	Uncontrolled	Controlled	
Benzene	74.2	64.0	3.2	68.5	3.4	
Toluene	37.1	31.9	1.6	34.2	1.7	
Ethylbenzene	2.3	2.0	0.1	2.1	0.1	
Xylene	18.5	16.0	0.3	17.1	0.9	
n-Hexane	909.2	784.0	39.2	839.2	42.0	
224 TMP	62.6	54.0	2.7	57.8	2.9	

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? **Yes** CO & Nox  
 If yes, are the uncontrolled actual or requested emissions estimated to be greater than or equal to 20 tons VOC per year? **No**  
 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? **Yes**  
 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? **Yes**  
 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? **No**  
 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	Pollutant	Uncontrolled Emissions		
				Factor	Control %	Units
0	01		PM10	0.01	0	lb/1,000 gallons crude oil throughput
			PM2.5	0.01	0	lb/1,000 gallons crude oil throughput
			NOx	0.12	0	lb/1,000 gallons crude oil throughput
			VOC	23.7	95	lb/1,000 gallons crude oil throughput
			CO	0.10	0	lb/1,000 gallons crude oil throughput
			Benzene	0.27	95	lb/1,000 gallons crude oil throughput
			Toluene	0.14	95	lb/1,000 gallons crude oil throughput
			Ethylbenzene	0.01	95	lb/1,000 gallons crude oil throughput
			Xylene	0.07	95	lb/1,000 gallons crude oil throughput
			n-Hexane	3.33	95	lb/1,000 gallons crude oil throughput
			224 TMP	0.23	95	lb/1,000 gallons crude oil throughput



City : Denver, CO  
 Min Ambient Temperature (F) : 37.2  
 Max Ambient Temperature (F) : 64.5  
 Total Solar Insolation (F) : 1501.00  
 Ambient Pressure (psia) : 12.63  
 Ambient Temperature (F) : 140.0

\*\*\*\*\*  
 \* Calculation Results \*  
 \*\*\*\*\*

-- Emission Summary ----- *5804.99 bbl*

	Uncontrolled ton	Controlled ton	
Total HAPs	0.4760	0.0238	
Total HC	3.3730	0.1687	<i>1.2035 VOC lbs/bbl</i>
VOCs, C2+	3.2990	0.1649	
VOCs, C3+	3.1080	0.1554	
CO2	0.0800		
CH4	0.0750		

Uncontrolled Recovery Information:

Vapor (mscfd) : 0.1202  
 HC Vapor (mscfd) : 0.1159  
 CO2 (mscfd) : 0.0000  
 CH4 (mscfd) : 0.0100  
 GOR (SCF/STB) : 7.8326

-- Emission Composition -----

NoComponent	Uncontrolled ton	Controlled ton	
1 H2S	0.0000	0.0000	
2 O2	0.0000	0.0000	
3 CO2	0.0800	0.0800	<i>0.02854 CO2 lbs/bbl</i>
4 N2	0.0080	0.0080	
5 C1	0.0750	0.0037	
6 C2	0.1910	0.0095	
7 C3	0.5280	0.0264	
8 i-C4	0.1180	0.0059	
9 n-C4	0.4090	0.0204	
10 i-C5	0.1070	0.0054	
11 n-C5	0.2340	0.0117	
12 C6	0.6810	0.0340	
13 Benzene	0.0320	0.0016	<i>0.011418 lbs benzene lbs/bbl</i>
14 Toluene	0.0160	0.0008	<i>0.00570 Toluene lbs/bbl</i>
15 E-Benzene	0.0010	0.0000	<i>0.000356 E-Benzene lbs/bbl</i>
16 Xylenes	0.0080	0.0004	<i>0.00285 Xylenes lbs/bbl</i>
17 n-C6	0.3920	0.0196	<i>0.13957 n-C6 lbs/bbl</i>
18 224Trimethylp	0.0270	0.0014	<i>0.009634 224 TriMethyl lbs/bbl</i>
19 Pseudo Comp1	0.3770	0.0189	
20 Pseudo Comp2	0.1520	0.0076	
21 Pseudo Comp3	0.0180	0.0009	
22 Pseudo Comp4	0.0080	0.0004	
23 Pseudo Comp5	0.0000	0.0000	
24 Total	3.4620	0.1731	

-- Stream Data -----

NoComponent	MW lb/lbmol	LP Oil mole %	Flash Oil mole %	Sales Oil mole %	Flash Gas mole %	W&S Gas mole %	Total Emission mole %
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	0.0580	0.0354	0.0051	4.6108	0.9083	3.1454
4 N2	28.01	0.0050	0.0010	0.0000	0.8091	0.0002	0.4889
5 C1	16.04	0.1170	0.0515	0.0000	13.3283	0.0001	8.0531
6 C2	30.07	0.2800	0.2184	0.0895	12.7113	8.3178	10.9724
7 C3	44.10	1.0440	0.9550	0.7069	19.0016	23.2881	20.6982

8 i-C4	58.12	0.3380	0.3248	0.2851	3.0006	4.2663	3.5016
9 n-C4	58.12	1.5690	1.5257	1.3942	10.3139	14.9285	12.1403
10 i-C5	72.15	0.7338	0.7266	0.7041	2.1772	3.1780	2.5733
11 n-C5	72.15	2.0220	2.0084	1.9650	4.7608	6.8664	5.5942
12 C6	84.00	13.8594	13.8675	13.8647	12.2209	16.7020	13.9945
13 Benzene	78.11	0.8054	0.8064	0.8076	0.6097	0.8296	0.6967
14 Toluene	92.14	1.0366	1.0404	1.0488	0.2732	0.3439	0.3011
15 E-Benzene	106.17	0.1882	0.1890	0.1910	0.0198	0.0232	0.0211
16 Xylenes	106.17	1.3842	1.3904	1.4046	0.1294	0.1500	0.1375
17 n-C6	86.18	7.8437	7.8486	7.8480	6.8555	9.3601	7.8468
18 224Trimethylp	114.23	1.0306	1.0339	1.0411	0.3602	0.4699	0.4036
19 Pseudo Comp1	96.00	20.8748	20.9473	21.1113	6.2644	7.5827	6.7862
20 Pseudo Comp2	113.17	22.3261	22.4258	22.6551	2.2222	2.4611	2.3167
21 Pseudo Comp3	134.00	7.7923	7.8297	7.9157	0.2326	0.2337	0.2330
22 Pseudo Comp4	152.68	8.9340	8.9778	9.0781	0.0948	0.0876	0.0919
23 Pseudo Comp5	207.17	7.7579	7.7963	7.8842	0.0038	0.0027	0.0033
		LP Oil	Flash Oil	Sales Oil	Flash Gas	W&S Gas	Total Emission
MW (lb/lbmol):		111.98	112.26	112.69	55.80	65.87	59.79
Stream Mole Ratio:		1.0000	0.9951	0.9918	0.0049	0.0032	0.0082
Stream Weight Ratio:		111.98	111.70	111.77	0.28	0.21	0.49
Total Emission (ton):					1.952	1.509	3.462
Heating Value (BTU/scf):					2970.84	3598.63	3219.31
Gas Gravity (Gas/Air):					1.93	2.27	2.06
Bubble Pt. @100F (psia):		11.15	7.94	4.64			
RVP @100F (psia):		41.04	36.71	28.36			
Spec. Gravity @100F:		0.70	0.70	0.70			

\*\*\*\*\*

\* Project Setup Information \*

\*\*\*\*\*

Project File : E:\APEN.Emissions Tracking\ef Modeling.Analyticals\Model files\Braukmann Farms C.ept  
 Flowsheet Selection : Oil Tank with Separator  
 Calculation Method : AP42  
 Control Efficiency : 95.00%  
 Known Separator Stream : Low Pressure Oil  
 Entering Air Composition : No  
 Component Group : C10+

Filed Name : Mull Drilling Company  
 Well Name : Braukmann Farms C  
 Date : 2014.09.08

\*\*\*\*\*

\* Data Input \*

\*\*\*\*\*

Separator Pressure (psia) : 56.00  
 Separator Temperature (F) : 140.0  
 C10+ SG : 0.78  
 C10+ MW(lb/lbmol) : 164.47

-- Low Pressure Oil -----

No.	Component	Mole%	Wt%
1	H2S	0.0000	0.0000
2	O2	0.0000	0.0000
3	CO2	0.0580	0.0222
4	N2	0.0050	0.0012
5	C1	0.1170	0.0163
6	C2	0.2800	0.0733
7	C3	1.0440	0.4007
8	i-C4	0.3380	0.1710
9	n-C4	1.5690	0.7937
10	i-C5	0.7338	0.4608
11	n-C5	2.0220	1.2698
12	C6	13.8594	10.3937
13	C7	20.8748	18.2057
14	C8	12.4886	12.4169
15	C9	9.8375	10.9841
16	C10+	24.4841	35.0502
17	Benzene	0.8054	0.5476
18	Toluene	1.0366	0.8312
19	E-Benzene	0.1882	0.1739
20	Xylenes	1.3842	1.2792
21	n-C6	7.8437	5.8836
22	224Trimethylp	1.0306	1.0248

-- Sales Oil -----

Production Rate (bbl/day) : 15.35  
 Days of Annual Operation : 365  
 API Gravity : 37.36  
 Reid Vapor Pressure (psia) : 3.60  
 Bulk Temperature : 113.0

-- Tank and Shell Data -----

Diameter (ft) : 12.00  
 Shell Height (ft) : 20.00  
 Cone Roof Slope : 0.06  
 Average Liquid Height (ft) : 10.00  
 Vent Pressure Range (psia) : 0.25  
 Solar Absorbance : 0.68

-- Meteorological Data -----



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**EXTENDED NATURAL GAS LIQUID ANALYSIS (\*DHA)**

**MAIN PAGE**

PROJECT NO. :	201408038	ANALYSIS NO. :	03
COMPANY NAME :	MULL DRILLING	ANALYSIS DATE:	AUGUST 8, 2014
ACCOUNT NO. :		SAMPLE DATE :	AUGUST 6, 2014
PRODUCER :		CYLINDER NO. :	27842
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	OIL TREATER 8:40 BRAUKMANN FARMS C		EMPACT
<b>***FIELD DATA***</b>			
SAMPLE PRES. :	56	SAMPLE TEMP. :	140
VAPOR PRES. :		AMBIENT TEMP.:	
COMMENTS :	SPOT; NO PROBE; SOME WATER IN SAMPLE - EMPACT		

<u>COMPONENT</u>	<u>MOLE %</u>	<u>MASS %</u>	<u>VOL %</u>
ALCOHOLS	0.0013	0.0008	0.0007
NITROGEN (AIR)	0.0050	0.0012	0.0011
CARBON DIOXIDE	0.0580	0.0223	0.0202
METHANE	0.1170	0.0164	0.0405
ETHANE	0.2800	0.0737	0.1530
PROPANE	1.0440	0.4029	0.5877
I-BUTANE	0.3380	0.1719	0.2259
N-BUTANE	1.5690	0.7981	1.0107
I-PENTANE	0.7338	0.4634	0.5494
N-PENTANE	1.2330	0.7786	0.9124
HEXANES PLUS	94.6209	97.2707	96.4984
<b>TOTALS</b>	<b>100.0000</b>	<b>100.0000</b>	<b>100.0000</b>

<u>BTEX COMPONENTS</u>	<u>MOLE%</u>	<u>MASS%</u>
BENZENE	0.8054	0.5506
TOLUENE	1.0366	0.8359
ETHYLBENZENE	0.1882	0.1749
XYLENE	1.3842	1.2862
<b>TOTAL BTEX</b>	<b>3.4144</b>	<b>2.8476</b>

(CALC: GPA STD 2145-94 & TP-17 @14.696 & 60 F)

	<u>TOTAL</u>	<u>C6+</u>
	<u>SAMPLE</u>	<u>FRACTION</u>
Specific Gravity (H2O=1) =	0.7396	0.7446 60/60
API Gravity =	59.82	58.53 60/60
Molecular Weight =	114.26	117.867
Absolute Density =	6.17	6.22 LBS/GAL
Heating Value Liq. Idl Gas=	125761	126815 BTU/GAL
Vapor/Liquid =	20.58	20.14 CUFT/GAL
Vapor Pressure =	13.16	1.78 PSIA @100 F

*\*(DETAILED HYDROCARBON ANALYSIS/NJ 1993) ; ASTM D6730*

*THIS DATA HAS BEEN ACQUIRED THROUGH APPLICATION OF CURRENT STATE-OF-THE-ART ANALYTICAL TECHNIQUES. THE USE OF THIS INFORMATION IS THE RESPONSIBILITY OF THE USER. EMPACT ANALYTICAL SYSTEMS, ASSUMES NO RESPONSIBILITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF ITS APPLICATION.*



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**EXTENDED NATURAL GAS LIQUID ANALYSIS (\*DHA)**

**E & P TANK / GLYCALC INFORMATION**

PROJECT NO. :	201408038	ANALYSIS NO. :	03
COMPANY NAME :	MULL DRILLING	ANALYSIS DATE:	AUGUST 8, 2014
ACCOUNT NO. :		SAMPLE DATE :	AUGUST 6, 2014
PRODUCER :		CYLINDER NO. :	27842
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	OIL TREATER 8:40 BRAUKMANN FARMS C		EMPACT
***FIELD DATA***		SAMPLE TEMP. :	140
SAMPLE PRES. :	56	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE; SOME WATER IN SAMPLE - EMPACT		

<u>COMPONENT</u>	<u>Mole %</u>	<u>Wt %</u>	<u>LV %</u>			
CARBON DIOXIDE	0.0580	0.0223	0.0202			
NITROGEN (AIR)	0.0050	0.0012	0.0011			
METHANE	0.1170	0.0164	0.0405			
ETHANE	0.2800	0.0737	0.1530			
PROPANE	1.0440	0.4029	0.5877			
I-BUTANE	0.3380	0.1719	0.2259			
N-BUTANE	1.5690	0.7981	1.0107			
I-PENTANE	0.7338	0.4634	0.5494			
N-PENTANE	1.2330	0.7786	0.9124			
CYCLOPENTANE (N-C5)	0.7890	0.4843	0.4712			
N-HEXANE	7.8436	5.9153	6.5909			
CYCLOHEXANE (OTHER C6)	3.8099	2.8062	2.6491			
OTHER HEXANES	10.0493	7.5172	8.0422			
OTHER HEPTANES	15.0540	13.1150	13.6768			
METHYLCYCLOHEXANE (OTHER C7)	5.8205	5.0019	4.7752			
2,2,4 TRIMETHYLPENTANE	1.0306	0.8857	0.8694			
BENZENE	0.8054	0.5506	0.4612			
TOLUENE	1.0366	0.8359	0.7071			
ETHYLBENZENE	0.1882	0.1749	0.1479			
XYLENES	1.3842	1.2862	1.0898			
OTHER OCTANES	12.4884	12.5235	12.5789			
OCTANES PLUS	----	49.4126	----	61.0443	----	59.1247
NONANES	9.8374	10.9311	10.7329			
DECANES PLUS	24.4838	35.2429	33.7058			
<u>SUB TOTAL</u>	<u>99.9987</u>	<u>99.9992</u>	<u>99.9993</u>			
<u>ALCOHOLS</u>	<u>0.0013</u>	<u>0.0008</u>	<u>0.0007</u>			
<u>TOTAL</u>	<u>100.0000</u>	<u>100.0000</u>	<u>100.0000</u>			

API Gravity	=	59.82	60/60
Vapor Pressure	=	13.16	PSIA & 100 F
Average Molecular Weight of Decanes plus	=	164.47	
Average Specific Gravity of Decanes plus	=	0.7780	

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**EXTENDED NATURAL GAS LIQUID ANALYSIS (\*DHA)**  
**BY CARBON NUMBER**

PROJECT NO. :	201408038	ANALYSIS NO. :	03
COMPANY NAME :	MULL DRILLING	ANALYSIS DATE:	AUGUST 8, 2014
ACCOUNT NO. :		SAMPLE DATE :	AUGUST 6, 2014
PRODUCER :		CYLINDER NO. :	27842
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	OIL TREATER 8:40 BRAUKMANN FARMS C		EMPACT
***FIELD DATA***		SAMPLE TEMP. :	140
SAMPLE PRES. :	56	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE; SOME WATER IN SAMPLE - EMPACT		

<u>COMPONENT / CARBON NUMBER</u>	<u>MOLE%</u>	<u>MASS %</u>	<u>VOLUME %</u>
ALCOHOLS	0.0013	0.0008	0.0007
NITROGEN	0.0050	0.0012	0.0011
CARBON DIOXIDE	0.0580	0.0223	0.0202
C1	0.1170	0.0164	0.0405
C2	0.2800	0.0737	0.1530
C3	1.0440	0.4029	0.5877
C4	1.9070	0.9700	1.2366
C5	2.7558	1.7263	1.9330
C6	22.5082	16.7893	17.7434
C7	21.9111	18.9528	19.1591
C8	15.0914	14.8703	14.6860
C9	9.8374	10.9311	10.7329
C10	8.7217	10.4698	10.0732
C11	4.6295	6.0575	5.6930
C12	2.9379	4.1169	3.9377
C13	2.5883	4.0555	3.8951
C14	2.1108	3.6650	3.5511
C15	1.5814	2.9400	2.8160
C16	1.1108	2.2014	2.0949
C17	0.4820	1.0144	0.9623
C18	0.2684	0.5978	0.5654
C19	0.0530	0.1246	0.1171
C20	0.0000	0.0000	0.0000
C21	0.0000	0.0000	0.0000
C22	0.0000	0.0000	0.0000
C23	0.0000	0.0000	0.0000
C24	0.0000	0.0000	0.0000
C25	0.0000	0.0000	0.0000
C26	0.0000	0.0000	0.0000
C27	0.0000	0.0000	0.0000
C28	0.0000	0.0000	0.0000
C29	0.0000	0.0000	0.0000
C30+	0.0000	0.0000	0.0000
<b>Total</b>	<b>100.0000</b>	<b>100.0000</b>	<b>100.0000</b>

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303-637-0150

**EXTENDED NATURAL GAS LIQUID ANALYSIS (\*DHA)**

**DHA COMPONENT LIST**

PROJECT NO. :	201408038	ANALYSIS NO. :	03
COMPANY NAME :	MULL DRILLING	ANALYSIS DATE:	AUGUST 8, 2014
ACCOUNT NO. :		SAMPLE DATE :	AUGUST 6, 2014
PRODUCER :		CYLINDER NO. :	27842
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	OIL TREATER 8:40 BRAUKMANN FARMS C		EMPACT
***FIELD DATA***		SAMPLE TEMP. :	140
SAMPLE PRES. :	56	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE; SOME WATER IN SAMPLE - EMPACT		

<u>COMPONENT</u>	<u>PIANO #</u>	<u>MOLE %</u>	<u>MASS %</u>	<u>VOL %</u>
Nitrogen	NHC	0.0050	0.0012	0.0011
Carbon Dioxide	NHC	0.0580	0.0223	0.0202
Methane	P1	0.1170	0.0164	0.0405
Ethane	P2	0.2800	0.0737	0.1530
Propane	P3	1.0440	0.4029	0.5877
i-Butane	I4	0.3380	0.1719	0.2259
n-Butane	P4	1.5690	0.7981	1.0107
2,2-Dimethylpropane	I5	0.0218	0.0138	0.0171
i-Pentane	I5	0.7120	0.4496	0.5323
n-Pentane	P5	1.2330	0.7786	0.9124
t-Butanol	X4	0.0013	0.0008	0.0007
2,2-Dimethylbutane	I6	0.0663	0.0500	0.0566
Cyclopentane	N5	0.7890	0.4843	0.4712
2,3-Dimethylbutane	I6	0.3977	0.3000	0.3327
2-Methylpentane	I6	3.7532	2.8308	3.1830
3-Methylpentane	I6	2.2972	1.7327	1.9158
n-Hexane	P6	7.8436	5.9153	6.5909
2,2-Dimethylpentane	I7	0.0371	0.0325	0.0352
Methylcyclopentane	N6	3.5349	2.6037	2.5541
2,4-Dimethylpentane	I7	0.2044	0.1792	0.1960
2,2,3-Trimethylbutane	I7	0.0326	0.0286	0.0304
Benzene	A6	0.8054	0.5506	0.4612
3,3-Dimethylpentane	I7	0.0219	0.0192	0.0204
Cyclohexane	N6	3.8099	2.8062	2.6491
2-Methylhexane	I7	1.2080	1.0594	1.1483
2,3-Dimethylpentane	I7	0.5190	0.4551	0.4792
1,1-Dimethylcyclopentane	N7	0.5894	0.5065	0.4934
3-Methylhexane	I7	1.8407	1.6142	1.7233
1c,3-Dimethylcyclopentane	N7	1.0837	0.9313	0.9190
1t,3-Dimethylcyclopentane	N7	1.0306	0.8857	0.8694
3-Ethylpentane	I7	0.1119	0.0981	0.1030
1t,2-Dimethylcyclopentane	N7	1.8021	1.5486	1.5148
2,2,4-Trimethylpentane	I8	0.0914	0.0914	0.0967
n-Heptane	P7	6.0253	5.2839	5.6783
1c,2-Dimethylcyclopentane	N7	0.1406	0.1208	0.1150
Methylcyclohexane	N7	5.8205	5.0019	4.7752
2,2-Dimethylhexane	I8	0.9143	0.9141	0.9657
Ethylcyclopentane	N7	0.2730	0.2346	0.2250
2,5-Dimethylhexane	I8	0.0806	0.0806	0.0854
2,2,3-Trimethylpentane	I8	0.0418	0.0418	0.0429
2,4-Dimethylhexane	I8	0.1824	0.1824	0.1923
1c,2t,4-Trimethylcyclopentane	N8	0.5610	0.5509	0.5305

3,3-Dimethylhexane	I8	0.0771	0.0771	0.0798
2,3,4-Trimethylpentane	I8	0.0226	0.0226	0.0231
2,3,3-Trimethylpentane	I8	0.0016	0.0016	0.0016
Toluene	A7	1.0366	0.8359	0.7071
2,3-Dimethylhexane	I8	0.2526	0.2525	0.2608
2-Methyl-3-ethylpentane	I8	0.0699	0.0699	0.0714
1,1,2-Trimethylcyclopentane	N8	0.0076	0.0075	0.0071
2-Methylheptane	I8	1.3955	1.3951	1.4665
4-Methylheptane	I8	0.3644	0.3643	0.3737
3-Methyl-3-ethylpentane	I8	0.1177	0.1177	0.1190
3,4-Dimethylhexane	I8	0.0835	0.0835	0.0853
1c,2c,4-Trimethylcyclopentane	N8	0.0432	0.0424	0.0404
1c,3-Dimethylcyclohexane	N8	0.0453	0.0445	0.0427
3-Methylheptane	I8	0.4735	0.4734	0.4933
1c,2t,3-Trimethylcyclopentane	N8	1.3479	1.3237	1.2633
3-Ethylhexane	I8	0.3239	0.3238	0.3339
1t,4-Dimethylcyclohexane	N8	0.6554	0.6436	0.6206
1,1-Dimethylcyclohexane	N8	0.1525	0.1498	0.1411
3c-Ethylmethylcyclopentane	N8	0.0058	0.0057	0.0055
3t-Ethylmethylcyclopentane	N8	0.1036	0.1017	0.0975
2t-Ethylmethylcyclopentane	N8	0.0829	0.0814	0.0778
1,1-Methylethylcyclopentane	N8	0.2512	0.2467	0.2323
2,2,4-Trimethylhexane	I9	0.0373	0.0419	0.0431
1t,2-Dimethylcyclohexane	N8	0.6512	0.6395	0.6062
1t,3-Dimethylcyclohexane	N8	0.0109	0.0107	0.0100
UnknownC7s	U7	0.1337	0.1173	0.1261
n-Octane	P8	2.9482	2.9474	3.0836
1c,4-Dimethylcyclohexane	N8	1.2517	1.2292	1.1547
i-Propylcyclopentane	I8	0.0775	0.0761	0.0721
2,4,4-Trimethylhexane	I9	0.0307	0.0345	0.0351
2,2,3,4-Tetramethylpentane	I9	0.0168	0.0189	0.0193
2,3,4-Trimethylhexane	I9	0.0277	0.0311	0.0317
1c,2-Dimethylcyclohexane	N8	0.0629	0.0618	0.0571
2,3,5-Trimethylhexane	I9	0.1179	0.1323	0.1348
2,2-Dimethylheptane	I9	0.0185	0.0208	0.0215
1,1,4-Trimethylcyclohexane	N9	0.9288	1.0262	0.9778
2,2,3-Trimethylhexane	I9	0.4093	0.4595	0.4633
2,4-Dimethylheptane	I9	0.0101	0.0113	0.0116
4,4-Dimethylheptane	I9	0.0602	0.0676	0.0695
Ethylcyclohexane	N8	0.5067	0.4976	0.4646
n-Propylcyclopentane	N8	0.1978	0.1943	0.1840
1c,3c,5-Trimethylcyclohexane	N9	0.0292	0.0323	0.0308
2,5-Dimethylheptane	I9	0.0548	0.0615	0.0631
3,3-Dimethylheptane	I9	0.0772	0.0867	0.0889
3,5-Dimethylheptane	I9	0.0387	0.0434	0.0445
2,6-Dimethylheptane	I9	0.0519	0.0583	0.0605
1,1,3-Trimethylcyclohexane	N9	0.0960	0.1061	0.1011
Ethylbenzene	A8	0.1882	0.1749	0.1479
1c,2t,4t-Trimethylcyclohexane	N9	0.3124	0.3452	0.3226
2,3-Dimethylheptane	I9	0.0518	0.0581	0.0589
1,3-Dimethylbenzene (m-Xylene)	A8	0.5989	0.5565	0.4734
1,4-Dimethylbenzene (p-Xylene)	A8	0.3958	0.3678	0.3139
3,4-Dimethylheptane	I9	0.0390	0.0438	0.0440
3,4-Dimethylheptane (2)	I9	0.1064	0.1194	0.1201
4-Ethylheptane	I9	0.0292	0.0328	0.0337
4-Methyloctane	I9	0.2261	0.2538	0.2590
2-Methyloctane	I9	0.3250	0.3648	0.3759
1c,2t,4c-Trimethylcyclohexane	I9	0.0710	0.0797	0.0808
3-Ethylheptane	I9	0.0636	0.0714	0.0723
3-Methyloctane	I9	0.4744	0.5325	0.5433
3,3-Diethylpentane	I9	0.0572	0.0642	0.0626
1c,2t,3-Trimethylcyclohexane	N9	0.0320	0.0354	0.0331
1,1,2-Trimethylcyclohexane	N9	0.0376	0.0415	0.0388
1,2-Dimethylbenzene (o-Xylene)	A8	0.3895	0.3619	0.3025
i-Butylcyclopentane	N9	0.2219	0.2452	0.2309
UnknownC8s	U8	0.0629	0.0629	0.0658
n-Nonane	P9	2.1012	2.3587	2.4168
1,1-Methylethylcyclohexane	N9	0.6453	0.7244	0.7445
i-Propylbenzene	A9	0.1897	0.1995	0.1699
i-Propylcyclohexane	N9	0.0986	0.1089	0.0999
2,2-Dimethyloctane	I10	0.0479	0.0596	0.0593
2,4-Dimethyloctane	I10	0.0573	0.0714	0.0710
2,6-Dimethyloctane	I10	0.0090	0.0112	0.0115
2,5-Dimethyloctane	I10	0.0358	0.0446	0.0444

n-Butylcyclopentane	N9	0.2009	0.2466	0.2270
3,3-Dimethyloctane	I10	0.0577	0.0719	0.0716
n-Propylbenzene	A9	0.3196	0.3362	0.2864
3,6-Dimethyloctane	I10	0.0934	0.1163	0.1157
3-Methyl-5-ethylheptane	I10	0.1489	0.1671	0.1693
1,3-Methylethylbenzene	A9	0.1365	0.1436	0.1213
1,4-Methylethylbenzene	A9	0.1636	0.1721	0.1454
1,3,5-Trimethylbenzene	A9	0.1758	0.1849	0.1573
2,3-Dimethyloctane	I10	0.0648	0.0807	0.0803
5-Methylnonane	I10	0.2419	0.3012	0.3024
1,2-Methylethylbenzene	A9	0.2512	0.2642	0.2220
2-Methylnonane	I10	0.0569	0.0709	0.0718
3-Ethylcyclohexane	I10	0.0642	0.0799	0.0795
3-Methylnonane	I10	0.1908	0.2376	0.2383
1,2,4-Trimethylbenzene	A9	0.0302	0.0318	0.0267
t-Butylbenzene	A10	0.2040	0.2396	0.2035
i-Butylcyclohexane	N10	0.1417	0.1740	0.1577
1t-Methyl-2-n-propylcyclohexane	I10	0.0577	0.0648	0.0657
i-Butylbenzene	A10	0.0713	0.0838	0.0723
sec-Butylbenzene	A10	0.0231	0.0271	0.0231
UnknownC9s	U9	1.2961	1.4549	1.4907
n-Decane	P10	1.9576	2.4377	2.4557
1,2,3-Trimethylbenzene	A9	0.1760	0.1851	0.1524
1,3-Methyl-i-propylbenzene	A10	0.0523	0.0550	0.0462
1,4-Methyl-i-propylbenzene	A10	0.0616	0.0648	0.0544
Sec-Butylcyclohexane	N10	0.3935	0.4831	0.4372
1,2-Methyl-i-propylbenzene	A10	0.2195	0.2579	0.2165
3-Ethylnonane	I10	0.0284	0.0354	0.0358
1,3-Diethylbenzene	A10	0.1044	0.1226	0.1044
1,3-Methyl-n-propylbenzene	A10	0.0654	0.0768	0.0656
1,4-Diethylbenzene	A10	0.0843	0.0990	0.0845
1,4-Methyl-n-propylbenzene	A10	0.0912	0.1071	0.0918
n-Butylbenzene	A10	0.0451	0.0530	0.0453
1,3-Dimethyl-5-ethylbenzene	A10	0.0413	0.0485	0.0413
1,2-Diethylbenzene	A10	0.1643	0.1930	0.1615
1,2-Methyl-n-propylbenzene	A10	0.1044	0.1226	0.1033
1,4-Dimethyl-2-ethylbenzene	A10	0.1033	0.1213	0.1018
1,3-Dimethyl-4-ethylbenzene	A10	0.0496	0.0583	0.0490
1,2-Dimethyl-4-ethylbenzene	A10	0.2184	0.2566	0.2159
1,3-Dimethyl-2-ethylbenzene	A10	0.0348	0.0409	0.0338
1t,2c,4-Trimethylcyclopentane	A10	0.7372	0.7240	0.7122
1,2-Dimethyl-3-ethylbenzene	A10	0.0291	0.0342	0.0282
1,2-Ethyl-i-propylbenzene	A10	0.0418	0.0491	0.0412
1,4-Methyl-t-butylbenzene	A11	0.2122	0.2493	0.2093
UnknownC10s	U10	2.3193	2.8881	2.9095
n-Undecane	P11	1.5781	2.1589	2.1447
1,4-Ethyl-i-propylbenzene	A11	0.0577	0.0678	0.0569
1,2,4,5-Tetramethylbenzene	A11	0.0566	0.0665	0.0552
1,2-Methyl-n-butylbenzene	A11	0.0628	0.0738	0.0620
1,2,3,5-Tetramethylbenzene	A11	0.0501	0.0588	0.0486
1,2-Methyl-t-butylbenzene	A11	0.0997	0.1171	0.0983
5-Methylindan	A11	0.0190	0.0283	0.0278
4-Methylindan	A11	0.0114	0.0170	0.0167
1,2-Ethyl-n-propylbenzene	A11	0.1477	0.1735	0.1457
2-Methylindan	A11	0.0375	0.0559	0.0549
1,3-Methyl-n-butylbenzene	A11	0.0593	0.0697	0.0585
1,3-Di-i-propylbenzene	A11	0.0181	0.0213	0.0179
sec-Pentylbenzene	A11	0.1367	0.1606	0.1348
n-Pentylbenzene	A11	0.0617	0.0801	0.0687
1t-M-2-(4MP)cyclopentane	P12	0.0093	0.0139	0.0137
1,2-Di-n-propylbenzene	A11	0.0687	0.0807	0.0677
1,4-Di-i-propylbenzene	A11	0.2223	0.2611	0.2192
Tetrahydronaphthalene	A10	0.0206	0.0242	0.0203
t-Decahydronaphthalene	A10	0.0783	0.0920	0.0772
Naphthalene	A10	0.1096	0.1229	0.1032
1-t-Butyl-3,5-dimethylbenzene	A12	0.0326	0.0383	0.0322
1,4-Ethyl-t-butylbenzene	A11	0.0387	0.0455	0.0382
UnknownC11s	U11	1.3510	1.8482	1.8361
n-Dodecane	P12	1.3158	1.9616	1.9273
1,3-Di-n-propylbenzene	A12	0.0529	0.0621	0.0521
1,3,5-Triethylbenzene	A12	0.0274	0.0288	0.0245
1,2,4-Triethylbenzene	A12	0.4582	0.4820	0.4048
1,4-Methyl-n-pentylbenzene	A12	0.0586	0.0688	0.0578
n-Hexylbenzene	A12	0.0593	0.0842	0.0722

1,2,3,4,5-Pentamethylbenzene	A13	0.2750	0.3230	0.2712
2-Methylnaphthalene	A11	0.1789	0.2227	0.1870
1-Methylnaphthalene	A11	0.1613	0.2007	0.1448
UnknownC12s	U12	0.9238	1.3772	1.3531
n-Tridecane	P13	1.1615	1.8741	1.8196
UnknownC13s	U13	1.1518	1.8584	1.8043
n-Tetradecane	P14	0.8412	1.4606	1.4152
UnknownC14s	U14	1.2696	2.2044	2.1359
n-Pentadecane	P15	0.4020	0.7474	0.7159
UnknownC15s	U15	1.1794	2.1926	2.1001
n-Hexadecane	P16	0.2932	0.5811	0.5530
UnknownC16s	U16	0.8176	1.6203	1.5419
n-Heptadecane	P17	0.2108	0.4436	0.4208
UnknownC17s	U17	0.2712	0.5708	0.5415
n-Octadecane	P18	0.0677	0.1508	0.1426
UnknownC18s	U18	0.2007	0.4470	0.4228
UnknownC19s	U19	0.0530	0.1246	0.1171
<u>TOTAL</u>		<u>100.0000</u>	<u>100.0000</u>	<u>100.0000</u>

THE DATA PRESENTED HEREIN HAS BEEN ACQUIRED THROUGH JUDICIOUS APPLICATION OF CURRENT STATE-OF-THE ART ANALYTICAL TECHNIQUES. THE APPLICATIONS OF THIS INFORMATION IS THE RESPONSIBILITY OF THE USER. EMPACT ANALYTICAL SYSTEMS, INC. ASSUMES NO RESPONSIBILITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF IT'S APPLICATION.



**COPY**

**CRUDE OIL ASSAY**

PROJECT NO. :	201408038	ANALYSIS NO. :	04
COMPANY NAME :	MULL DRILLING	ANALYSIS DATE:	AUGUST 11, 2014
ACCOUNT NO. :		SAMPLE DATE :	AUGUST 6, 2014
PRODUCER :		CYLINDER NO. :	1L GLASS JAR
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	PRODUCTION TANK 8:50 BRAUKMANN FARMS C		EMPACT
***FIELD DATA***		SAMPLE TEMP. :	113
SAMPLE PRES. :		AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT		

<u>SPECIFICATION</u>	<u>TEST METHOD</u>	<u>UNITS</u>	<u>RESULTS</u>
API GRAVITY		API 60/60	34.4
RVP @100 DEG F	D323	PSIG	3.6
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, THICK
<u>BS&amp;W</u>	D96		
Crude Oil		VOL %	N/A
Water		VOL %	N/A
Emulsion		VOL %	N/A
Sediment		VOL %	N/A
<u>DISTILLATION:</u>	D86		
INITIAL POINT		DEG F	N/A
50%		DEG F	N/A
90%		DEG F	N/A
END POINT		DEG F	N/A
<u>DISTILLATION:</u>	<u>@TEMP</u>	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**

*The data presented herein has been acquired by means of current analytical techniques and represents the judicious conclusion EMPACT Analytical Systems, Inc. Results of the analysis can be affected by the sampling conditions, therefore, are only warranted through proper lab protocol. EMPACT assumes no responsibility for interpretation or any consequences from application of the reported information and is the sole liability of the user. The reproduction in any media of this reported information may not be made, in portion or as a whole, without the written permission of EMPACT Analytical Systems, Inc.*

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Page 2 of 14

File No. DF268

Well 1-C Braukmann Farms

Hydrocarbon Analyses of Separator Products and Calculated Well Stream

COMPONENT	SEPARATOR LIQUID		SEPARATOR GAS		WELL STREAM	
	MOL %	LIQ. VOL. %	MOL %	GPM	MOL %	GPM
Hydrogen Sulfide	0.00	0.00	0.00		0.00	
Carbon Dioxide	0.04	0.08	1.85		0.74	
Nitrogen	0.03	0.01	13.95		5.41	
Methane	0.60	0.12	48.12		18.98	
Ethane	0.82	0.25	15.58		6.53	
Propane	1.57	0.50	10.23	2.82	4.92	1.35
iso-Butane	0.42	0.16	1.38	0.45	0.79	0.26
N-Butane	1.76	0.64	4.31	1.36	2.75	0.87
iso-Pentane	0.83	0.35	0.96	0.35	0.88	0.32
N-Pentane	1.60	0.67	1.44	0.52	1.54	0.56
Hexanes	10.00	4.73	0.46	0.19	6.31	2.60
Heptanes plus	82.33	92.58	1.72	0.79	51.15	50.09
TOTAL	100.00	100.00	100.00	6.485	100.00	56.05

Calculated Gas Gravity (AIR = 1.000) 0.9941

PROPERTIES OF HEPTANE PLUS

API Gravity = 29.75  
 Specific Gravity = 0.8775  
 Molecular Weight = 271

BASIS OF RECOMBINATION

Stock Tank Liquid per MMSCF Separator gas = 3289 Bbls  
 Shrinkage Factor = 0.9800  
 Separator Liquid per MMSCF Separator gas = 3356 Bbls