



May 22, 2015

NSR Program Manager  
Attn: Oil and Gas Production Facilities  
Wyoming Department of Environmental Quality  
Air Quality Division  
Herschler Building 2-E  
122 W. 25th St.  
Cheyenne, Wyoming 82002



RE: MBU Hornbuckle E-28/21H Well Pad Facility Air Permit Application - Wyoming  
Department of Environmental Quality (WDEQ)  
Kleinfelder Project No.: 20154924.001A

On behalf of Helis Oil & Gas Company, LLC (Helis), please find the enclosed Chapter 6, Section 2 permit application and supporting documentation for the MBU Hornbuckle E-28/21H Well Pad located in Converse County, Wyoming. Upon approval of the construction permit, Helis requests a permit to operate be issued per WAQS&R Chapter 6, Section 2(a)(iii).

The facility also contains one (1) 302hp NG 11.1L pumping unit engine. The engine is fitted with a non-selective catalyst and air-fuel ratio controller. The engine is covered under waiver P0014889.

If you have any questions or require any additional information, please contact me at (719) 632-3593 or by email at [msteyskal@kleinfelder.com](mailto:msteyskal@kleinfelder.com). Thank you for your assistance in this matter.

Sincerely,  
**KLEINFELDER**

Michele Steyskal  
Air Quality Professional

enc: MBU Hornbuckle E-28/21H Air Permit Application

cc: Mark Hedstrom, Helis Oil & Gas Company, LLC

Reviewer HMB  
cc: \_\_\_\_\_  
Modeler \_\_\_\_\_  
D.E. \_\_\_\_\_  
File A000146  
IMP FID F026265

**Helis Oil & Gas Company, LLC**

**Chapter 6 Section 2 Application  
for MBU Hornbuckle E-28/21H Well Pad**

**Converse County, WY**

**May 2015**

**Prepared by:**



**1801 California Street, Suite 1100  
Denver, CO 80202  
(303) 237-6601  
Fax (303) 237-6602  
[www.kleinfelder.com](http://www.kleinfelder.com)**

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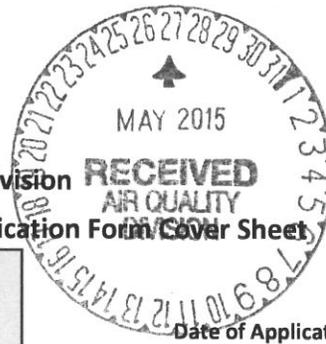
- A. Wyoming DEQ Forms**
- B. Emission Calculations**
- C. Process Description and Flow Diagram**
- D. Supporting Documentation**

**Wyoming DEQ Application Forms**



Air Quality Division

New Source Review Permit Application Form Cover Sheet



Is this a revision to an existing application?  
 Yes \_\_\_\_\_ No X  
 Previous Application #: \_\_\_\_\_  
 Other waivers on site: P0014889

Date of Application: 5/22/2015

COMPANY INFORMATION:

Company Name: Helis Oil and Gas Company, LLC  
 Address: P.O. Box 159  
 City: Billings State: Montana Zip Code: 59103-0159  
 Country: USA Phone Number: (406) 265-0942

FACILITY INFORMATION:

Facility Name: MBU Hornbuckle E-28/21H  
 New Facility or Existing Facility: New  
 Facility Description: Oil and Gas Well Site  
 Facility Class: Minor Operating Status: Operating  
 Facility Type: Production Site

For Oil & Gas Production Sites ONLY:

First Date of Production (FDOP)/Date of Modification: 3/13/2015  
 Single well or multiple well facility? Single Well  
 Does production at this facility contain H2S?\* Yes

\*If yes, contact the Division.

API Number(s): 49-009-29742

NAICS Code: 2111 Oil and Gas Extraction

FACILITY LOCATION:

\*Enter the facility location in either the latitude/longitude area or section/township/range area. Both are not required.

Physical Address: \_\_\_\_\_  
 City: \_\_\_\_\_ Zip Code: \_\_\_\_\_  
 State: WY County: \_\_\_\_\_

OR

Latitude: 43.14448 Longitude: -105.86475 County: Converse  
 Quarter: SW Quarter: SE  
 Section: 28 Township: 37 North Range: 75 West

For longitude and latitude, use NAD 83/WGS84 datum and 5 digits after the decimal (i.e. 41.12345, -107.56789)

CONTACT INFORMATION:

\*Note that an Environmental AND NSR Permitting Contact is required for your application to be deemed complete by the agency.

Title: Mr. First Name: Mark  
 Last Name: Hedstrom  
 Company Name: Helis Oil and Gas Company, LLC  
 Job Title: Field Supervisor  
 Address: P.O. Box 159  
 City: Billings State: Montana  
 Zip Code: \_\_\_\_\_  
 Primary Phone No.: (406) 265-0942 E-mail: mhedstrom@live.com  
 Mobile Phone No.: \_\_\_\_\_ Fax No.: \_\_\_\_\_  
 Contact Type: NSR Permitting contact Start Date: \_\_\_\_\_

\*Name of the contact to whom the permit will be issued: \_\_\_\_\_

Additional Contact Type (if needed):

Title:  First Name: \_\_\_\_\_ Same as above

Last Name: \_\_\_\_\_

Company Name: \_\_\_\_\_

Job Title: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State:

Zip Code: \_\_\_\_\_

Primary Phone No.: \_\_\_\_\_ E-mail: \_\_\_\_\_

Mobile Phone No.: \_\_\_\_\_ Fax No.: \_\_\_\_\_

Contact Type:  Start Date: \_\_\_\_\_

**FACILITY APPLICATION INFORMATION:**

**General Info:**

Has the facility changed location or is it a new/ greenfield facility?

Has a Land Use Planning document been included in this application?

Is the facility located in a sage grouse core area? \*

If the facility is in a sage grouse core area, what is the WER number? \_\_\_\_\_

*\* For questions about sage grouse core area, contact WY Game & Fish Department.*

**Federal Rules Applicability - Facility Level:**

Prevention of Significant Deterioration (PSD):

Non-Attainment New Source Review:

**Modeling Section:**

Has the Air Quality Division been contacted to determine if modeling is required?

Is a modeling analysis part of this application?

Is the proposed project subject to Prevention of Significant Deterioration (PSD) requirements?

Has the Air Quality Division been notified to schedule a pre-application meeting?

Has a modeling protocol been submitted to and approved by the Air Quality Division?

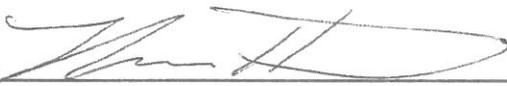
Has the Air Quality Division received a Q/D analysis to submit to the respective FLMS to determine the need for an AQRV analysis?

**Required Attachments:**

- Facility Map
- Process Flow Diagram
- Modeling Analysis (if applicable)
- Land Use Planning Document
- Detailed Project Description
- Emissions Calculations

I, Mark Hedstrom Area Supervisor  
 Responsible Official (Printed Name) Title

an Official Representative of the Company, state that I have knowledge of the facts herein set forth and that the same are true and correct to the best of my knowledge and belief. I further certify that the operational information provided and emission rates listed on this application reflect the anticipated emissions due to the operation of this facility. The facility will operate in compliance with all applicable Wyoming Air Quality Standards and Regulations.

Signature:   
 (ink)

Date: 5/22/2015

Specific Emission Unit Attributes:

Storage Tank/Silo

Company Equipment ID: TNK-1 through TNK-6
Company Equipment Description: Oil Tanks 1-6

Operating Status: Operating
Initial Construction Commencement Date: 2/1/2015
Initial Operation Commencement Date: 3/13/2015
Most Recent Construction/ Modification Commencement Date: N/A

Most Recent Operation Commencement Date: N/A

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: Construction (Greenfield/New Facility)

If reason is Reconstruction or Temporary Permit or Other, please explain below:

Material Type: Liquid
Description of Material Stored: Oil

Capacity: 400 Units: barrels
Maximum Throughput: 254.4 (total for 6 tanks) Units: barrels/day
Maximum Hourly Throughput: 1.77 each Units: barrels/hr
Operating Pressure (psig): 0
Vapor Pressure of Material Stored (psig): 2.9
Is Tank Heated?: No

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

4-04-003-12

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: 24
Hours/year: 8760

Control Equipment:

**If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.**

**Best Available Control Technology (BACT):** Was a BACT Analysis completed for this emission unit?

Yes  No

Pollutant: \_\_\_\_\_

Proposed BACT: \_\_\_\_\_

\*If yes, attach BACT Analysis with this application.

**Lowest Achievable Emission Rate (LAER):** Was a LAER Analysis completed for this emission unit?

Yes  No

Pollutant: \_\_\_\_\_

Proposed LAER: \_\_\_\_\_

\*If yes, attach LAER Analysis with this application.

**Federal and State Rule Applicability:**

New Source Performance Standards (NSPS):

*New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.*

NSPS Subpart: OOOO; below 6 tpy threshold

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61):

*National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).*

Part 61 NESHAP Subpart: \_\_\_\_\_

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63):

*National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63*

Part 63 NESHAP Subpart: \_\_\_\_\_

Prevention of Significant Deterioration (PSD):

*These rules are found under WAQSR Chapter 6, Section 4.*

Non-Attainment New Source Review:

*These rules are found under WAQSR Chapter 6, Section 13.*

Pollutant Emissions Form  
(submit one for each emission unit)

**Emissions Information-** The following tables request information needed to determine the applicable requirements and the compliance status of this emission unit with those requirements.

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

**Criteria Pollutants:**

1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)					
2.)	PM #10 microns in diameter (PE/PM10)					
3.)	PM #2.5 microns in diameter (PE/PM2.5)					
4.)	Sulfur dioxide (SO2)					
5.)	Nitrogen Oxides (NOx)					
6.)	Carbon monoxide (CO)					
7.)	Volatile organic compounds (VOC)	183.52		0.84	3.67	Tanks Program
8.)	Lead (Pb)					
9.)	Total Hazardous Air Pollutants (HAPs)	1.46		0.0066	0.029	Tanks Program
10.)	Fluoride (F)					
11.)	Hydrogen Sulfide (H2S)					
12.)	Mercury (Hg)					
13.)	Total Reduced Sulfur (TRS)					
14.)	Sulfuric Acid Mist (SAM)					

*\*Provide your calculations as an attachment and explain how all process variables and emissions factors were selected.*

**Hazardous Air Pollutants (HAPs) and Toxic Air Contaminants**

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

**Pollutants:**

1.)	Benzene	1.14E-01		5.25E-04	2.30E-03	Tanks Program
2.)	Toluene	1.16E-01		5.25E-04	2.30E-03	Tanks Program
3.)	Ethylbenzene	2.00E-03		9.13E-06	4.00E-05	Tanks Program
4.)	Xylenes	1.50E-02		6.85E-05	3.00E-04	Tanks Program
5.)	n-Hexane	1.19E+00		5.48E-03	2.40E-02	Tanks Program
6.)	2,2,4-Trimethylpentan	3.10E-02		1.42E-04	6.20E-04	Tanks Program
7.)						
8.)						

**Greenhouse Gases (GHGs)**

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

**Pollutants:**

1.)						
2.)						
3.)						
4.)						
5.)						
6.)						
7.)						
8.)						

**Specific Emission Unit Attributes:**

**Storage Tank/Silo**

Company Equipment ID: TNK-7 through TNK-8  
Company Equipment Description: Water Tanks 1 and 2

Operating Status:   
Initial Construction Commencement Date: 2/1/2015  
Initial Operation Commencement Date: 3/13/2015  
Most Recent Construction/ Modification Commencement Date: N/A  
Most Recent Operation Commencement Date: N/A

**Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):**

Reason:

If reason is **Reconstruction** or **Temporary Permit** or **Other**, please explain below:

Material Type:   
Description of Material Stored: Produced Water

Capacity: 400 Units:   
Maximum Throughput: 558.61 (total for both tanks) Units:   
Maximum Hourly Throughput: 11.64 each Units:   
Is Tank Heated?:

**SCC Codes:** List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

4-04-003-15

**Potential Operating Schedule:** Provide the operating schedule for this emission unit.  
Hours/day: 24  
Hours/year: 8760

Control Equipment:  Yes  No

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

Yes  No

Pollutant: \_\_\_\_\_

Proposed BACT: \_\_\_\_\_

\*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

Yes  No

Pollutant: \_\_\_\_\_

Proposed LAER: \_\_\_\_\_

\*If yes, attach LAER Analysis with this application.

**Federal and State Rule Applicability:**

New Source Performance Standards (NSPS):  Subject, but exempt

*New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.*

NSPS Subpart: 0000; below 6 tpy threshold

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61):  Not Effected

*National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).*

Part 61 NESHAP Subpart: \_\_\_\_\_

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63):  Not Effected

*National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63*

Part 63 NESHAP Subpart: \_\_\_\_\_

Prevention of Significant Deterioration (PSD):  Not Affected

*These rules are found under WAQSR Chapter 6, Section 4.*

Non-Attainment New Source Review:  Not Affected

*These rules are found under WAQSR Chapter 6, Section 13.*

Specific Emission Unit Attributes:

Separator/Treater

Company Equipment ID: SEP-1
Company Equipment Description: Three Phase Heated Separator

Operating Status: Operating
Initial Construction Commencement Date: 2/1/2015
Initial Operation Commencement Date: 3/13/2015
Most Recent Construction/ Modification Commencement Date: N/A

Most Recent Operation Commencement Date: N/A

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: Construction (Greenfield/New Facility)

If reason is Reconstruction or Temporary Permit or Other, please explain below:

Type of Vessel: 3-Phase Separator Is Vessel Heated? Yes
Operating Temperature (F): 110
Operating Pressure (psig): 85

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

3-10-001-29

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: 24
Hours/year: 8760

Control Equipment:

*If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.*

**Best Available Control Technology (BACT):** Was a BACT Analysis completed for this emission unit?

Yes  No

Pollutant: \_\_\_\_\_

Proposed BACT: \_\_\_\_\_

\*If yes, attach BACT Analysis with this application.

**Lowest Achievable Emission Rate (LAER):** Was a LAER Analysis completed for this emission unit?

Yes  No

Pollutant: \_\_\_\_\_

Proposed LAER: \_\_\_\_\_

\*If yes, attach LAER Analysis with this application.

**Federal and State Rule Applicability:**

New Source Performance Standards (NSPS):

*New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.*

NSPS Subpart: \_\_\_\_\_

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61):

*National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).*

Part 61 NESHAP Subpart: \_\_\_\_\_

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63):

*National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63*

Part 63 NESHAP Subpart: \_\_\_\_\_

Prevention of Significant Deterioration (PSD):

*These rules are found under WAQSR Chapter 6, Section 4.*

Non-Attainment New Source Review:

*These rules are found under WAQSR Chapter 6, Section 13.*

Specific Emission Unit Attributes:

### Heater/Chiller

Company Equipment ID: HET-1  
 Company Equipment Description: Heater Treater for 3 Phase Separator(0.5 MMBtu/hr burner)

Operating Status: Operating  
 Initial Construction Commencement Date: 2/1/2015  
 Initial Operation Commencement Date: 3/13/2015  
 Most Recent Construction/ Modification Commencement Date: N/A  
 Most Recent Operation Commencement Date: N/A

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: Construction (Greenfield/New Facility)

If reason is **Reconstruction** or **Temporary Permit** or **Other**, please explain below:

Firing Type: Direct  
 Heat Input Rating: 0.5 Units: MMBtu/hr  
 Primary Fuel Type: Field Gas  
 Secondary Fuel Type: None  
 Heat Content of Fuel: 1375 Units: BTU/scf  
 Fuel Sulfur Content: 2 Units: ppm

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

3-10-004-03

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: 24  
 Hours/year: 8760

Control Equipment:

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

Yes  No

Pollutant: \_\_\_\_\_

Proposed BACT: \_\_\_\_\_

\*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

Yes  No

Pollutant: \_\_\_\_\_

Proposed LAER: \_\_\_\_\_

\*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS):

New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.

NSPS Subpart: \_\_\_\_\_

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61):

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: \_\_\_\_\_

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63):

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: \_\_\_\_\_

Prevention of Significant Deterioration (PSD):

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review:

These rules are found under WAQSR Chapter 6, Section 13.

**Emissions Information-** The following tables request information needed to determine the applicable requirements and the compliance status of this emission unit with those requirements.

		Efficiency Standards					
Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination		
<b>Criteria Pollutants:</b>							
1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)	0.022	5.53E-03	lb/MMBtu	0.0050	0.022	AP-42
2.)	PM #10 microns in diameter (PE/PM10)	0.022	5.53E-03	lb/MMBtu	0.0050	0.022	AP-42
3.)	PM #2.5 microns in diameter (PE/PM2.5)	0.022	5.53E-03	lb/MMBtu	0.0050	0.022	AP-42
4.)	Sulfur dioxide (SO2)	0.0017	4.36E-04	lb/MMBtu	0.0004	0.0017	AP-42
5.)	Nitrogen Oxides (NOx)	0.29	7.27E-02	lb/MMBtu	0.066	0.29	AP-42
6.)	Carbon monoxide (CO)	0.24	6.11E-02	lb/MMBtu	0.055	0.24	AP-42
7.)	Volatile organic compounds (VOC)	0.016	4.00E-03	lb/MMBtu	0.004	0.016	AP-42
8.)	Lead (Pb)						
9.)	Total Hazardous Air Pollutants (HAPs)	0.0054	1.37E-03	lb/MMBtu	0.0012	0.0054	AP-42
10.)	Fluoride (F)						
11.)	Hydrogen Sulfide (H2S)						
12.)	Mercury (Hg)						
13.)	Total Reduced Sulfur (TRS)						
14.)	Sulfuric Acid Mist (SAM)						

*\*Provide your calculations as an attachment and explain how all process variables and emissions factors were selected.*

**Hazardous Air Pollutants (HAPs) and Toxic Air Contaminants**

		Efficiency Standards					
Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination		
<b>Pollutants:</b>							
1.)	Benzene	6.10E-06	1.53E-06	lb/MMBtu	1.3927E-06	6.10E-06	AP-42
2.)	Formaldehyde	2.20E-04	5.45E-05	lb/MMBtu	5.0228E-05	2.20E-04	AP-42
3.)	Toluene	1.00E-05	2.47E-06	lb/MMBtu	2.2831E-06	1.00E-05	AP-42

**Greenhouse Gases (GHGs)**

		Efficiency Standards				
Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination	
<b>Pollutants:</b>						
1.)						
2.)						
3.)						
4.)						
5.)						
6.)						
7.)						
8.)						

Specific Emission Unit Attributes:

Separator/Treater

Company Equipment ID: SEP-2
Company Equipment Description: Two Phase Separator

Operating Status: Operating
Initial Construction Commencement Date: 2/1/2015
Initial Operation Commencement Date: 3/13/2015
Most Recent Construction/ Modification Commencement Date: N/A

Most Recent Operation Commencement Date: N/A

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: Construction (Greenfield/New Facility)

If reason is Reconstruction or Temporary Permit or Other, please explain below:

Type of Vessel: 2-Phase Separator Is Vessel Heated? No
Operating Temperature (F): ambient
Operating Pressure (psig): 20

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

3-10-001-29

Potential Operating Schedule: Provide the operating schedule for this emission unit.
Hours/day: 24
Hours/year: 8760

Control Equipment:

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

Yes  No

Pollutant: \_\_\_\_\_

Proposed BACT: \_\_\_\_\_

\*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

Yes  No

Pollutant: \_\_\_\_\_

Proposed LAER: \_\_\_\_\_

\*If yes, attach LAER Analysis with this application.

**Federal and State Rule Applicability:**

New Source Performance Standards (NSPS):

*New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.*

NSPS Subpart: \_\_\_\_\_

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61):

*National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).*

Part 61 NESHAP Subpart: \_\_\_\_\_

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63):

*National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63*

Part 63 NESHAP Subpart: \_\_\_\_\_

Prevention of Significant Deterioration (PSD):

*These rules are found under WAQSR Chapter 6, Section 4.*

Non-Attainment New Source Review:

*These rules are found under WAQSR Chapter 6, Section 13.*

Specific Emission Unit Attributes:

Separator/Treater

Company Equipment ID: SEP-3

Company Equipment Description: Heater Treater

Operating Status: Operating

Initial Construction Commencement Date: 2/1/2015

Initial Operation Commencement Date: 3/13/2015

Most Recent Construction/ Modification Commencement Date: N/A

Most Recent Operation Commencement Date: N/A

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: Construction (Greenfield/New Facility)

If reason is Reconstruction or Temporary Permit or Other, please explain below:

Type of Vessel: Heater-Treater

Is Vessel Heated? Yes

Operating Temperature (F): 125

Operating Pressure (psig): 27

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

3-10-001-29

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: 24

Hours/year: 8760

Control Equipment:

*If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.*

**Best Available Control Technology (BACT):** Was a BACT Analysis completed for this emission unit?

Yes  No

Pollutant: \_\_\_\_\_

Proposed BACT: \_\_\_\_\_

\*If yes, attach BACT Analysis with this application.

**Lowest Achievable Emission Rate (LAER):** Was a LAER Analysis completed for this emission unit?

Yes  No

Pollutant: \_\_\_\_\_

Proposed LAER: \_\_\_\_\_

\*If yes, attach LAER Analysis with this application.

**Federal and State Rule Applicability:**

New Source Performance Standards (NSPS):

*New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.*

NSPS Subpart: \_\_\_\_\_

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61):

*National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).*

Part 61 NESHAP Subpart: \_\_\_\_\_

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63):

*National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63*

Part 63 NESHAP Subpart: \_\_\_\_\_

Prevention of Significant Deterioration (PSD):

*These rules are found under WAQSR Chapter 6, Section 4.*

Non-Attainment New Source Review:

*These rules are found under WAQSR Chapter 6, Section 13.*

**Specific Emission Unit Attributes:**

**Heater/Chiller**

Company Equipment ID: HET-2  
 Company Equipment Description: Heater for Heater Treater

Operating Status: Operating  
 Initial Construction Commencement Date: 2/1/2015  
 Initial Operation Commencement Date: 3/13/2015  
 Most Recent Construction/ Modification Commencement Date: N/A  
 Most Recent Operation Commencement Date: N/A

**Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):**

Reason: Construction (Greenfield/New Facility)

If reason is **Reconstruction** or **Temporary Permit** or **Other**, please explain below:

Firing Type: Direct  
 Heat Input Rating: 1 Units: MMBtu/hr  
 Primary Fuel Type: Field Gas  
 Secondary Fuel Type: None  
 Heat Content of Fuel: 1375 Units: BTU/scf  
 Fuel Sulfur Content: 2 Units: ppm

**SCC Codes:** List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

3-10-004-03

**Potential Operating Schedule:** Provide the operating schedule for this emission unit.

Hours/day: 24  
 Hours/year: 8760

Control Equipment:

*If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.*

**Best Available Control Technology (BACT):** Was a BACT Analysis completed for this emission unit?

Yes  No

Pollutant: \_\_\_\_\_

Proposed BACT: \_\_\_\_\_

\*If yes, attach BACT Analysis with this application.

**Lowest Achievable Emission Rate (LAER):** Was a LAER Analysis completed for this emission unit?

Yes  No

Pollutant: \_\_\_\_\_

Proposed LAER: \_\_\_\_\_

\*If yes, attach LAER Analysis with this application.

**Federal and State Rule Applicability:**

New Source Performance Standards (NSPS):

*New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.*

NSPS Subpart: \_\_\_\_\_

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61):

*National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).*

Part 61 NESHAP Subpart: \_\_\_\_\_

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63):

*National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63*

Part 63 NESHAP Subpart: \_\_\_\_\_

Prevention of Significant Deterioration (PSD):

*These rules are found under WAQSR Chapter 6, Section 4.*

Non-Attainment New Source Review:

*These rules are found under WAQSR Chapter 6, Section 13.*

Pollutant Emissions Form  
(submit one for each emission unit)

**Emissions Information-** The following tables request information needed to determine the applicable requirements and the compliance status of this emission unit with those requirements.

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)					

**Criteria Pollutants:**

1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)	0.044	5.53E-03	lb/MMBtu	0.0100	0.044	AP-42
2.)	PM #10 microns in diameter (PE/PM10)	0.044	5.53E-03	lb/MMBtu	0.0100	0.044	AP-42
3.)	PM #2.5 microns in diameter (PE/PM2.5)	0.044	5.53E-03	lb/MMBtu	0.0100	0.044	AP-42
4.)	Sulfur dioxide (SO2)	0.0035	4.36E-04	lb/MMBtu	0.00080	0.0035	AP-42
5.)	Nitrogen Oxides (NOx)	0.58	7.27E-02	lb/MMBtu	0.132	0.58	AP-42
6.)	Carbon monoxide (CO)	0.49	6.11E-02	lb/MMBtu	0.112	0.49	AP-42
7.)	Volatile organic compounds (VOC)	0.032	4.00E-03	lb/MMBtu	0.0073	0.032	AP-42
8.)	Lead (Pb)						
9.)	Total Hazardous Air Pollutants (HAPs)	0.011	1.37E-03	lb/MMBtu	0.0025	0.011	AP-42
10.)	Fluoride (F)						
11.)	Hydrogen Sulfide (H2S)						
12.)	Mercury (Hg)						
13.)	Total Reduced Sulfur (TRS)						
14.)	Sulfuric Acid Mist (SAM)						

*\*Provide your calculations as an attachment and explain how all process variables and emissions factors were selected.*

**Hazardous Air Pollutants (HAPs) and Toxic Air Contaminants**

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

**Pollutants:**

1.)	Benzene	1.20E-05	1.53E-06	lb/MMBtu	2.74E-06	1.20E-05	AP-42
2.)	Formaldehyde	4.30E-04	5.45E-05	lb/MMBtu	9.82E-05	4.30E-04	AP-42
3.)	Toluene	2.00E-05	2.47E-06	lb/MMBtu	4.57E-06	2.00E-05	AP-42
4.)							
5.)							
6.)							
7.)							
8.)							

**Greenhouse Gases (GHGs)**

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

**Pollutants:**

1.)							
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

**Specific Emission Unit Attributes:**

**Fugitives**

Company Equipment ID: FUG-1

Company Equipment Description: Fugitive component leaks

Operating Status: Operating

Initial Construction Commencement Date: 2/1/2015

Initial Operation Commencement Date: 3/13/2015

Most Recent Construction/ Modification Commencement Date: N/A

Most Recent Operation Commencement Date: N/A

**Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):**

Reason: Construction (Greenfield/New Facility)

If reason is **Reconstruction** or **Temporary Permit** or **Other**, please explain below:

Type of Fugitive Emission: Fugitive Leaks at O&G

**SCC Codes:** List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

3-10-001-01

**Potential Operating Schedule:** Provide the operating schedule for this emission unit.

Hours/day: 24

Hours/year: 8760

Control Equipment:

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

Yes  No

Pollutant: \_\_\_\_\_

Proposed BACT: \_\_\_\_\_

\*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

Yes  No

Pollutant: \_\_\_\_\_

Proposed LAER: \_\_\_\_\_

\*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS):

*New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.*

NSPS Subpart: \_\_\_\_\_

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61):

*National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).*

Part 61 NESHAP Subpart: \_\_\_\_\_

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63):

*National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63*

Part 63 NESHAP Subpart: \_\_\_\_\_

Prevention of Significant Deterioration (PSD):

*These rules are found under WAQSR Chapter 6, Section 4.*

Non-Attainment New Source Review:

*These rules are found under WAQSR Chapter 6, Section 13.*

Pollutant Emissions Form  
(submit one for each emission unit)

**Emissions Information-** The following tables request information needed to determine the applicable requirements and the compliance status of this emission unit with those requirements.

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

**Criteria Pollutants:**

1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)					
2.)	PM #10 microns in diameter (PE/PM10)					
3.)	PM #2.5 microns in diameter (PE/PM2.5)					
4.)	Sulfur dioxide (SO <sub>2</sub> )					
5.)	Nitrogen Oxides (NO <sub>x</sub> )					
6.)	Carbon monoxide (CO)					
7.)	Volatile organic compounds (VOC)	2.15		0.491	2.15	Other
8.)	Lead (Pb)					
9.)	Total Hazardous Air Pollutants (HAPs)	0.2		0.046	0.2	Other
10.)	Fluoride (F)					
11.)	Hydrogen Sulfide (H <sub>2</sub> S)	3.01E-05		6.87E-06	3.01E-05	Other
12.)	Mercury (Hg)					
13.)	Total Reduced Sulfur (TRS)					
14.)	Sulfuric Acid Mist (SAM)					

*\*Provide your calculations as an attachment and explain how all process variables and emissions factors were selected.*

**Hazardous Air Pollutants (HAPs) and Toxic Air Contaminants**

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

**Pollutants:**

1.)	Benzene	3.97E-03		9.07E-04	3.97E-03	Other
2.)	Toluene	8.54E-03		1.95E-03	8.54E-03	Other
3.)	Ethylbenzene	1.25E-03		2.85E-04	1.25E-03	Other
4.)	Xylenes	3.23E-03		7.36E-04	3.23E-03	Other
5.)	n-Hexane	1.84E-01		4.20E-02	1.84E-01	Other
6.)						
7.)						
8.)						

**Greenhouse Gases (GHGs)**

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

**Pollutants:**

1.)						
2.)						
3.)						
4.)						
5.)						
6.)						
7.)						
8.)						

Specific Emission Unit Attributes:

Flare

Company Equipment ID: FLR-1

Company Equipment Description: Flare for storage tank emissions and truck loading emissions control

Operating Status: Operating

Initial Construction Commencement Date: 2/1/2015

Initial Operation Commencement Date: 3/13/2015

Most Recent Construction/ Modification Commencement Date: N/A

Most Recent Operation Commencement Date: N/A

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: Construction (Greenfield/New Facility)

If reason is **Reconstruction** or **Temporary Permit** or **Other**, please explain below:

Maximum Design Capacity (MMSCF/hr): 0.046 (HP), 0.017 (LP)

Minimum Design Capacity (MMSCF/hr): 0.0044 (HP), 0.0013 (LP)

Pilot Gas Volume (scf/min): 0.18

Emergency Flare Only: No Ignition Device Type: Pilot

Btu Content (Btu/scf): 2,431 Smokeless Design: Yes

Assist Gas Utilized? No Continuously Monitored?\* Yes

\*If yes, describe continuous monitoring:

Thermocouple

Waste Gas Volume: 11,160 Units: scf/day

Installation Date: 2/1/2015

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

3-10-001-60

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: 24

Hours/year: 8760

Control Equipment:

*If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.*

**Best Available Control Technology (BACT):** Was a BACT Analysis completed for this emission unit?

Yes  No

Pollutant: \_\_\_\_\_

Proposed BACT: \_\_\_\_\_

\*If yes, attach BACT Analysis with this application.

**Lowest Achievable Emission Rate (LAER):** Was a LAER Analysis completed for this emission unit?

Yes  No

Pollutant: \_\_\_\_\_

Proposed LAER: \_\_\_\_\_

\*If yes, attach LAER Analysis with this application.

**Federal and State Rule Applicability:**

New Source Performance Standards (NSPS):

*New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.*

NSPS Subpart: \_\_\_\_\_

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61):

*National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).*

Part 61 NESHAP Subpart: \_\_\_\_\_

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63):

*National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63*

Part 63 NESHAP Subpart: \_\_\_\_\_

Prevention of Significant Deterioration (PSD):

*These rules are found under WAQSR Chapter 6, Section 4.*

Non-Attainment New Source Review:

*These rules are found under WAQSR Chapter 6, Section 13.*

Pollutant Emissions Form  
(submit one for each emission unit)

**Emissions Information-** The following tables request information needed to determine the applicable requirements and the compliance status of this emission unit with those requirements.

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

**Criteria Pollutants:**

1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)	0	5.53E-04	lb/MMBtu	8.45E-05	0.00037	AP-42
2.)	PM #10 microns in diameter (PE/PM10)	0	5.53E-04	lb/MMBtu	8.45E-05	0.00037	AP-42
3.)	PM #2.5 microns in diameter (PE/PM2.5)	0	5.53E-04	lb/MMBtu	8.45E-05	0.00037	AP-42
4.)	Sulfur dioxide (SO <sub>2</sub> )	0	4.36E-04	lb/MMBtu	6.62E-06	0.000029	AP-42
5.)	Nitrogen Oxides (NO <sub>x</sub> )	0	0.14	lb/MMBtu	1.62E-01	0.71	Other
6.)	Carbon monoxide (CO)	0	0.035	lb/MMBtu	4.11E-02	0.18	Other
7.)	Volatile organic compounds (VOC)	0	4.00E-03	lb/MMBtu	5.94E-05	0.00026	AP-42
8.)	Lead (Pb)						
9.)	Total Hazardous Air Pollutants (HAPs)	0	1.37E-03	lb/MMBtu	2.08E-05	0.000091	AP-42
10.)	Fluoride (F)						
11.)	Hydrogen Sulfide (H <sub>2</sub> S)						
12.)	Mercury (Hg)						
13.)	Total Reduced Sulfur (TRS)						
14.)	Sulfuric Acid Mist (SAM)						

*\*Provide your calculations as an attachment and explain how all process variables and emissions factors were selected.*

**Hazardous Air Pollutants (HAPs) and Toxic Air Contaminants**

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

Pollutants:

1.)	0	2.06E-06	lb/MMBtu	2.28E-08	1.00E-07	
2.)	0	7.35E-05	lb/MMBtu	8.22E-07	3.60E-06	
3.)	0	3.33E-06	lb/MMBtu	3.42E-08	1.50E-07	
4.)						
5.)						
6.)						
7.)						
8.)						

**Greenhouse Gases (GHGs)**

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

Pollutants:

1.)						
2.)						
3.)						
4.)						
5.)						
6.)						
7.)						
8.)						

**Control Equipment:**

**Flare/Combustor**

Manufacturer: Steffes Corp.  
Model Name and  
Number: TBD  
Company Control Equipment

Date Installed: 2/1/2015  
Company Control  
Equipment ID: FLR-1

Description: Flare to control emissions from storage tanks and truck loading.

Pollutant(s) Controlled:		<input type="checkbox"/> CO	<input type="checkbox"/> NOx	<input type="checkbox"/> Pb	<input type="checkbox"/> SO2	<input checked="" type="checkbox"/> VOC	<input type="checkbox"/> PM
<input type="checkbox"/> PM (FIL)	<input type="checkbox"/> PM Condensable	<input type="checkbox"/> PM 10 (FIL)	<input type="checkbox"/> PM 2.5 (FIL)	<input type="checkbox"/> PM 10	<input type="checkbox"/> PM 2.5		
<input checked="" type="checkbox"/> Other HAPS							

Design Control Efficiency (%): >98 Capture Efficiency (%): 100

Operating Control Efficiency (%): >98

Flare Type: Elevated- Open Elevated Flare Type: Non-Assisted

Ignition Device: Yes Flame Presence Sensor: Yes

Inlet Gas Temp (F): Variable/ambient Flame Presence Type: Thermocouple

Gas Flow Rate (acfm): 30.00 Outlet Gas Temp (F): 1835

This is the only control equipment on this air contaminant source

If not, this control equipment is:  Primary  Secondary  Parallel

List all other emission units that are also vented to this control equipment: TNK-1 through TNK-8 and LUD-1

List all release point IDs associated with this control equipment: FLR-1

**Specific Emission Unit Attributes:**

**Pneumatic Equipment (Pumps and Controllers)**

Company Equipment ID: PNE - 1 through 7  
 Company Equipment Description: Natural Gas powered pneumatic controllers for process

Operating Status: Operating  
 Initial Construction Commencement Date: 2/1/2015  
 Initial Operation Commencement Date: 3/13/2015  
 Most Recent Construction/ Modification Commencement Date: N/A  
 Most Recent Operation Commencement Date: N/A

**Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):**

Reason: Construction (Greenfield/New Facility)

If reason is **Reconstruction** or **Temporary Permit** or **Other**, please explain below:

Type of Equipment: Controller Bleed/Consumption Rate (cfh): 6  
 Controller Type: Intermittent  
 Motive Force: Field Gas VOC Content (%): 13.83  
 HAP Content (%): 0.21

**SCC Codes:** List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

3-10-001-02

**Potential Operating Schedule:** Provide the operating schedule for this emission unit.

Hours/day: 24  
 Hours/year: 8760

Control Equipment:

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

Yes  No

Pollutant: \_\_\_\_\_

Proposed BACT: \_\_\_\_\_

\*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

Yes  No

Pollutant: \_\_\_\_\_

Proposed LAER: \_\_\_\_\_

\*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS):

*New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.*

NSPS Subpart: OOOO, Only subject if controllers have a bleed rate greater than 6 scfh

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61):

*National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).*

Part 61 NESHAP Subpart: \_\_\_\_\_

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63):

*National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63*

Part 63 NESHAP Subpart: \_\_\_\_\_

Prevention of Significant Deterioration (PSD):

*These rules are found under WAQSR Chapter 6, Section 4.*

Non-Attainment New Source Review:

*These rules are found under WAQSR Chapter 6, Section 13.*

Pollutant Emissions Form  
(submit one for each emission unit)

**Emissions Information-** The following tables request information needed to determine the applicable requirements and the compliance status of this emission unit with those requirements.

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

**Criteria Pollutants:**

1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)					
2.)	PM #10 microns in diameter (PE/PM10)					
3.)	PM #2.5 microns in diameter (PE/PM2.5)					
4.)	Sulfur dioxide (SO2)					
5.)	Nitrogen Oxides (NOx)					
6.)	Carbon monoxide (CO)					
7.)	Volatile organic compounds (VOC)	3.56		0.81	3.56	Other
8.)	Lead (Pb)					
9.)	Total Hazardous Air Pollutants (HAPs)	0.102		0.020	0.089	Other
10.)	Fluoride (F)					
11.)	Hydrogen Sulfide (H2S)	0.000005		1.14E-06	0.000005	Other
12.)	Mercury (Hg)					
13.)	Total Reduced Sulfur (TRS)					
14.)	Sulfuric Acid Mist (SAM)					

*\*Provide your calculations as an attachment and explain how all process variables and emissions factors were selected.*

**Hazardous Air Pollutants (HAPs) and Toxic Air Contaminants**

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

**Pollutants:**

1.)	Benzene	9.43E-03		2.15E-03	9.43E-03	
2.)	Toluene	1.26E-02		2.87E-03	1.26E-02	
3.)	Ethylbenzene	1.18E-03		2.70E-04	1.18E-03	
4.)	Xylenes	6.64E-03		1.52E-03	6.64E-03	
5.)	n-Hexane	5.93E-02		1.35E-02	5.93E-02	
6.)						
7.)						
8.)						

**Greenhouse Gases (GHGs)**

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

**Pollutants:**

1.)						
2.)						
3.)						
4.)						
5.)						
6.)						
7.)						
8.)						

**Specific Emission Unit Attributes:**

**Loading/Unloading/Dump**

Company Equipment ID: LUD-1  
 Company Equipment Description: Oil Truck Loading

Operating Status: Operating  
 Initial Construction Commencement Date: 2/1/2015  
 Initial Operation Commencement Date: 3/13/2015  
 Most Recent Construction/ Modification Commencement Date: N/A

Most Recent Operation Commencement Date: N/A

**Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):**

Reason: Construction (Greenfield/New Facility)

If reason is **Reconstruction** or **Temporary Permit** or **Other**, please explain below:

Type of Material: Liquid  
 Material Description: Oil

Maximum Annual Throughput:	<u>92,856</u>	Units:	<u>barrels/yr</u>
Maximum Hourly Throughput:	<u>180</u>	Units:	<u>barrels/hr</u>

Detailed Description of Loading/Unloading/Dump Source: When needed, oil is transported offsite by way of tanker trucks. Source results in VOC emissions from loading oil into tanker trucks.

**SCC Codes:** List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

4-06-001-42

**Potential Operating Schedule:** Provide the operating schedule for this emission unit.

Hours/day: Variable  
 Hours/year: Variable

Control Equipment:

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

Yes  No

Pollutant: \_\_\_\_\_

Proposed BACT: \_\_\_\_\_

\*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

Yes  No

Pollutant: \_\_\_\_\_

Proposed LAER: \_\_\_\_\_

\*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS):

*New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.*

NSPS Subpart: \_\_\_\_\_

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61):

*National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).*

Part 61 NESHAP Subpart: \_\_\_\_\_

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63):

*National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63*

Part 63 NESHAP Subpart: \_\_\_\_\_

Prevention of Significant Deterioration (PSD):

*These rules are found under WAQSR Chapter 6, Section 4.*

Non-Attainment New Source Review:

*These rules are found under WAQSR Chapter 6, Section 13.*



Specific Emission Unit Attributes:

**Loading/Unloading/Dump**

Company Equipment ID: LUD-2

Company Equipment Description: Water Truck Loading

Operating Status: Operating

Initial Construction Commencement Date: 2/1/2015

Initial Operation Commencement Date: 3/13/2015

Most Recent Construction/ Modification Commencement Date: N/A

Most Recent Operation Commencement Date: N/A

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: Construction (Greenfield/New Facility)

If reason is **Reconstruction** or **Temporary Permit** or **Other**, please explain below:

Type of Material: Liquid

Material Description: Produced Water

Maximum Annual Throughput: 203,894 Units: barrels/yr

Maximum Hourly Throughput: 180 Units: barrels/hr

Detailed Description of Loading/Unloading/Dump Source: When needed, produced water is transported offsite by way of tanker trucks.

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

4-06-001-42

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: Variable

Hours/year: Variable

Control Equipment:

*If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.*

**Best Available Control Technology (BACT):** Was a BACT Analysis completed for this emission unit?

Yes  No

Pollutant: \_\_\_\_\_

Proposed BACT: \_\_\_\_\_

\*If yes, attach BACT Analysis with this application.

**Lowest Achievable Emission Rate (LAER):** Was a LAER Analysis completed for this emission unit?

Yes  No

Pollutant: \_\_\_\_\_

Proposed LAER: \_\_\_\_\_

\*If yes, attach LAER Analysis with this application.

**Federal and State Rule Applicability:**

New Source Performance Standards (NSPS):

*New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.*

NSPS Subpart: \_\_\_\_\_

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61):

*National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).*

Part 61 NESHAP Subpart: \_\_\_\_\_

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63):

*National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63*

Part 63 NESHAP Subpart: \_\_\_\_\_

Prevention of Significant Deterioration (PSD):

*These rules are found under WAQSR Chapter 6, Section 4.*

Non-Attainment New Source Review:

*These rules are found under WAQSR Chapter 6, Section 13.*

**Release Point Information:**

Complete the table below for *each* release point. Please include release point information for each emission unit. Multiple attachments may be necessary. A release point is a point at which emissions from an emission unit are released into the ambient (outside)air. List each individual release point on a separate pair of lines (release point ID and description). *For longitude and latitude, use NAD 83/WGS84 datum and 5 digits after the decimal (i.e. 41.12345, -107.56789)*

Stack Release Point Information	
Company Release Point ID: <b>SEP-1/HET-1</b>	Release Point Type: <input type="text" value="Vertical"/> Release Point Latitude: <u>43.14448</u> Release Point Longitude: <u>-105.86475</u>
Company Release Point Description: <b>Stack for 3-Phase Separator Heater</b>	Base Elevation (ft): <u>5558</u> Stack Height (ft): <u>12</u> Stack Diameter (ft): <u>1.5</u> Exit Gas Velocity (ft/s): <u>20</u> Exit Gas Temp (F): <u>~350</u> Exit Gas Flow Rate (acfm): <u>530</u>
Company Release Point ID: <b>SEP-3/HET-2</b>	Release Point Type: <input type="text" value="Vertical"/> Release Point Latitude: <u>43.14448</u> Release Point Longitude: <u>-105.86475</u>
Company Release Point Description: <b>Stack for Heater Treater Heater</b>	Base Elevation (ft): <u>5558</u> Stack Height (ft): <u>12</u> Stack Diameter (ft): <u>1.5</u> Exit Gas Velocity (ft/s): <u>20</u> Exit Gas Temp (F): <u>~350</u> Exit Gas Flow Rate (acfm): <u>530</u>
Company Release Point ID: <b>FLR-1</b>	Release Point Type: <input type="text" value="Vertical"/> Release Point Latitude: <u>43.14448</u> Release Point Longitude: <u>-105.86475</u>
Company Release Point Description: <b>Stack for Flare</b>	Base Elevation (ft): <u>5558</u> Stack Height (ft): <u>~20</u> Stack Diameter (ft): <u>~0.5</u> Exit Gas Velocity (ft/s): <u>6.096</u> Exit Gas Temp (F): <u>1835</u> Exit Gas Flow Rate (acfm): <u>30</u>
Company Release Point ID:	Release Point Type: <input type="text"/>
	Release Point Latitude: _____ Release Point Longitude: _____
Company Release Point Description:	Base Elevation (ft): _____ Stack Height (ft): _____ Stack Diameter (ft): _____ Exit Gas Velocity (ft/s): _____ Exit Gas Temp (F): _____ Exit Gas Flow Rate (acfm): _____

Complete the table below for each fugitive (area, volume, line) release point. List each individual release point on a separate line.

Fugitive Release Point Information	
Company Release Point ID:	Release Point Latitude: <u>43.14448</u>
<b>FUG-1</b>	Release Point Longitude: <u>-105.86475</u>
Company Release Point Description:	Release Height (ft): <u>0-10 feet above grade</u>
<b>Fugitive emissions from component leaks.</b>	
Company Release Point ID:	Release Point Latitude: <u>43.14448</u>
<b>PNE-1</b>	Release Point Longitude: <u>-105.86475</u>
Company Release Point Description:	Release Height (ft): <u>0-10 feet above grade</u>
<b>Pneumatic Devices (7)</b>	
Company Release Point ID:	Release Point Latitude: _____
	Release Point Longitude: _____
Company Release Point Description:	Release Height (ft): _____
Company Release Point ID:	Release Point Latitude: _____
	Release Point Longitude: _____
Company Release Point Description:	Release Height (ft): _____

## Emission Calculations

# Emissions Summary

Company: Helix Oil & Gas Company LLC  
 Facility Name: MBU Hornbuckle E-28/21H  
 Location: Converse County, WY

### Uncontrolled Potential to Emit

Source	NOx		CO		VOC		PM-10		PM-2.5		SO2		Total HAPs	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Truck Loading Emissions	-	-	-	-	-	4.01	-	-	-	-	-	-	-	0.032
Fugitive Emissions	-	-	-	-	0.49	2.15	-	-	-	-	-	-	-	0.20
Heaters Emissions	0.20	0.87	0.17	0.73	0.011	0.048	0.015	0.066	0.015	0.066	0.001	0.003	0.004	0.016
Oil Tank Emissions	-	-	-	-	41.90	183.52	-	-	-	-	-	-	0.33	1.46
Pneumatic Controller Emissions	-	-	-	-	0.81	3.56	-	-	-	-	-	-	0.020	0.089
Combustor Emissions	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Totals</b>	<b>0.20</b>	<b>0.87</b>	<b>0.17</b>	<b>0.73</b>	<b>43.21</b>	<b>193.29</b>	<b>0.02</b>	<b>0.07</b>	<b>0.02</b>	<b>0.07</b>	<b>0.001</b>	<b>0.003</b>	<b>0.40</b>	<b>1.80</b>

### Controlled Potential to Emit

Source	NOx		CO		VOC		PM-10		PM-2.5		SO2		Total HAPs	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr								
Truck Loading Emissions	-	-	-	-	-	0.080	-	-	-	-	-	-	-	0.0006
Fugitive Emissions	-	-	-	-	0.49	2.15	-	-	-	-	-	-	-	0.20
Heaters Emissions	0.20	0.87	0.17	0.73	0.011	0.048	0.015	0.066	0.015	0.066	0.001	0.003	0.004	0.016
Oil Tank Emissions	-	-	-	-	0.84	3.67	-	-	-	-	-	-	0.007	0.029
Pneumatic Controller Emissions	-	-	-	-	0.81	3.56	-	-	-	-	-	-	0.020	0.089
Combustor Emissions	0.16	0.71	0.041	0.18	0.0001	0.0003	0.0001	0.0004	0.0001	0.0004	0.00001	0.00003	0.00002	0.0001
<b>Totals</b>	<b>0.36</b>	<b>1.58</b>	<b>0.21</b>	<b>0.91</b>	<b>2.15</b>	<b>9.51</b>	<b>0.02</b>	<b>0.07</b>	<b>0.02</b>	<b>0.07</b>	<b>0.001</b>	<b>0.004</b>	<b>0.08</b>	<b>0.34</b>

VOC emissions from tanks and truck loading are controlled by 98% by means of a smokeless combustor.

# Annual Truck Loading Emissions

**Company: Helis Oil & Gas Company LLC**  
**Facility Name: MBU Hornbuckle E-28/21H**  
**Location: Converse County, WY**

**AP - 42, Chapter 5.2**       $L_L = 12.46 \times S \times P \times M / T$

$L_L$  = Loading Loss Emission Factor (lbs VOC/1000 gal loaded)  
 S = Saturation Factor  
 P = True Vapor Pressure of the Loaded Liquid (psia)  
 M = Vapor Molecular Weight of the Loaded Liquid (lbs/lbmol)  
 T = Temperature of Loaded Liquid (°R)

**VOC Emissions (tpy) =** 
$$\frac{L_L (\text{lbs VOC}/1000 \text{ gal}) * 42 \text{ gal}/\text{bbl} * 365 \text{ days}/\text{year} * \text{production (bbl}/\text{day})}{1000 \text{ gal} * 2000 \text{ lbs}/\text{ton}}$$

Location	Factors	S	TVP (psi) <sup>1</sup>	M <sup>1</sup>	T (°R)	L <sub>L</sub>	Production	Uncontrolled VOC	Controlled VOC
						lb/1000 gal	bpd	tpy	tpy
Truck Loading	12.46	0.6	2.80	50	510	2.054	254.4	4.01	0.080

Notes:

- 1) Vapor molecular weight and True Vapor Pressure (TVP) of the loaded liquid from AP-42 Chapter 7, Table 7.1-2, assuming the properties of Crude Oil RVP 5.
- 2) Truck loading emissions will be controlled by an flare with a destruction efficiency of 98%.

Hazardous Air Pollutant	Uncontrolled tpy	Controlled tpy
Benzene	2.49E-03	4.98E-05
Toluene	2.53E-03	5.06E-05
Ethylbenzene	4.36E-05	8.73E-07
Xylenes	3.27E-04	6.55E-06
n-Hexane	2.59E-02	5.18E-04
2,2,4-Trimethylpentane	6.77E-04	1.35E-05
Total HAPs	3.19E-02	6.37E-04

- 3) Hazardous air pollutants are calculated using weight percents of individual HAPs and VOC from tank emissions.

# Fugitive VOC Emissions

Company: Helis Oil & Gas Company LLC  
 Facility Name: MBU Hornbuckle E-28/21H  
 Location: Converse County, WY

Equipment Type and Service	No. of Units	Hours of Operation (hrs/yr)	VOC Weight Fraction <sup>1</sup>	Emission Factor <sup>2</sup> (lb/day-unit)	Emission Factor (lb/hr-unit)	VOC Emissions (tons/yr)
Valves - Gas	97	8,760	0.035	0.24	0.01	0.15
Valves - Light Oil	82	8,760	0.292	0.13	0.005	0.57
Valves - Heavy Oil	0	8,760	0.03	0.00044	0.00002	0.00
Valves - Water/Lt. Oil	19	8,760	0.292	0.0052	0.0002	0.005
Connectors - Gas	415	8,760	0.035	0.011	0.0005	0.029
Connectors - Light Oil	168	8,760	0.292	0.011	0.0005	0.10
Connectors - Heavy Oil	0	8,760	0.03	0.0004	0.00002	0.00
Connectors - Water/ Lt. Oil	32	8,760	0.292	0.0058	0.0002	0.01
Open-Ended Lines - Gas	0	8,760	0.035	0.11	0.005	0.000
Open-Ended Lines - Light Oil	0	8,760	0.292	0.074	0.003	0.000
Open-Ended Lines - Heavy Oil	0	8,760	0.03	0.0074	0.0003	0.00
Open-Ended Lines - Water/Lt. Oil	0	8760	0.292	0.013	0.0005	0.000
Flanges - Gas	38	8,760	0.035	0.021	0.0009	0.005
Flanges - Light Oil	54	8,760	0.292	0.0058	0.0002	0.017
Flanges - Heavy Oil	0	8,760	0.03	0.000021	0.000001	0.00
Flanges - Water/Lt. Oil	15	8,760	0.292	0.00015	0.00001	0.00012
Other - Gas	56	8,760	0.035	0.47	0.02	0.168
Other - Light Oil	37	8,760	0.292	0.4	0.02	0.79
Other - Heavy Oil	0	8,760	0.03	0.0017	0.00007	0.00
Other - Water/Lt. Oil	8	8,760	0.292	0.74	0.03	0.32
<b>TOTAL VOC EMISSIONS (tons/yr)</b>						<b>2.15</b>

<sup>1</sup>VOC weight fraction from Appendix B of the WYDEQ C6 S2 Production Facilities Permitting Guidance, September 2013

<sup>2</sup>Emission Factors from Appendix B of the WYDEQ C6 S2 Production Facilities Permitting Guidance, September 2013

$$\text{VOC Emissions (tons/yr)} = \frac{\text{Emission Factor (lb/hr)} * \text{Number of Units} * \text{Hours of Operation (hrs/yr)} * \text{VOC Wt. Fraction}}{2,000 \text{ lbs/ton}}$$

Heavy Oil < 20 API Gravity, Light Oil >= 20 API Gravity

Other equipment may include compressors, diaphragms, drains, dump arms, hatches, instruments, meters, pressure relief valves, polished rods, and vents.

Number of components estimated from actual count at a similar, representative facility.

# Fugitive HAP Emissions

Company: Heils Oil & Gas Company LLC  
 Facility Name: MBU Hornbuckle E-28/21H  
 Location: Converse County, WY

Equipment Type and Service	No. of Units	Hours of Operation (hrs/yr)	Benzene Weight Fraction	Toluene Weight Fraction	Ethylbenzene Weight Fraction	Xylenes Weight Fraction	n-Hexane Weight Fraction <sup>1</sup>	Emission Factor <sup>2</sup> (lb/day-unit)	HAP Emissions (tons/yr)
Valves - Gas	97	8,760	0.00023	0.00039	0.00002	0.00010	0.00338	0.24	1.8E-02
Valves - Light Oil	82	8,760	0.00027	0.00075	0.00017	0.00036	0.02430	0.13	5.0E-02
Valves - Heavy Oil	0	8,760	0.00935	0.00344	0.00051	0.00372	0.00752	0.00044	0.0E+00
Valves - Water/Lt. Oil	19	8,760	0.00027	0.00075	0.00017	0.00036	0.02430	0.0052	4.7E-04
Connectors - Gas	415	8,760	0.00023	0.00039	0.00002	0.00010	0.00338	0.011	3.4E-03
Connectors - Light Oil	168	8,760	0.00027	0.00075	0.00017	0.00036	0.02430	0.011	8.7E-03
Connectors - Heavy Oil	0	8,760	0.00935	0.00344	0.00051	0.00372	0.00752	0.0004	0.0E+00
Connectors - Water/Lt. Oil	32	8,760	0.00027	0.00075	0.00017	0.00036	0.02430	0.0058	8.8E-04
Open-Ended Lines - Gas	0	8,760	0.00023	0.00039	0.00002	0.00010	0.00338	0.11	0.0E+00
Open-Ended Lines - Light Oil	0	8,760	0.00027	0.00075	0.00017	0.00036	0.02430	0.074	0.0E+00
Open-Ended Lines - Heavy Oil	0	8,760	0.00935	0.00344	0.00051	0.00372	0.00752	0.0074	0.0E+00
Open-Ended Lines - Water/Lt. Oil	0	8,760	0.00027	0.00075	0.00017	0.00036	0.02430	0.013	0.0E+00
Flanges - Gas	38	8,760	0.00023	0.00039	0.00002	0.00010	0.00338	0.021	6.0E-04
Flanges - Light Oil	54	8,760	0.00027	0.00075	0.00017	0.00036	0.02430	0.0058	1.5E-03
Flanges - Heavy Oil	0	8,760	0.00935	0.00344	0.00051	0.00372	0.00752	0.00021	0.0E+00
Flanges - Water/Lt. Oil	15	8,760	0.00027	0.00075	0.00017	0.00036	0.02430	0.00015	1.1E-05
Other - Gas	56	8,760	0.00023	0.00039	0.00002	0.00010	0.00338	0.47	2.0E-02
Other - Light Oil	37	8,760	0.00027	0.00075	0.00017	0.00036	0.02430	0.4	7.0E-02
Other - Heavy Oil	0	8,760	0.00935	0.00344	0.00051	0.00372	0.00752	0.0017	0.0E+00
Other - Water/Lt. Oil	8	8,760	0.00027	0.00075	0.00017	0.00036	0.02430	0.74	2.8E-02
<b>TOTAL HAP EMISSIONS (tons/yr)</b>									<b>0.20</b>

<sup>1</sup>HAP weight fraction from Appendix B of the WYDEQ C6 S2 Production Facilities Permitting Guidance, September 2013  
<sup>2</sup> Emission Factors from Appendix B of the WYDEQ C6 S2 Production Facilities Permitting Guidance, September 2013

$$\text{HAP Emissions (tons/yr)} = \frac{\text{Emission Factor (lb/hr)} * \text{Number of Units} * \text{Hours of Operation (hrs/yr)} * \text{HAP Wt. Fraction}}{2,000 \text{ lbs/ton}}$$

Hazardous Air Pollutant	lb/hr	tpy
Benzene	9.07E-04	3.97E-03
Toluene	1.95E-03	8.54E-03
Ethylbenzene	2.85E-04	1.25E-03
Xylenes	7.36E-04	3.23E-03
n-Hexane	4.20E-02	1.84E-01

Heavy Oil < 20 API Gravity, Light Oil >= 20 API Gravity

Other equipment may include compressors, diaphragms, drains, dump arms, hatches, instruments, meters, pressure relief valves, polished rods, and vents.

Number of components estimated from actual count at a similar, representative facility.

# Fugitive H2S Emissions

Company: Helis Oil & Gas Company LLC  
 Facility Name: MBU Hornbuckle E-28/21H  
 Location: Converse County, WY

Equipment Type and Service	No. of Units	Hours of Operation (hrs/yr)	H <sub>2</sub> S Weight Fraction <sup>1</sup>	Emission Factor <sup>2</sup> (lb/day-unit)	Emission Factor (lb/hr-unit)	H <sub>2</sub> S Emissions (tons/yr)
Valves - Gas	97	8,760	0.000003	0.24	0.01	1.27E-05
Valves - Light Oil	82	8,760	0.0	0.13	0.005	0.0
Valves - Heavy Oil	0	8,760	0.0	0.00044	0.00002	0.0
Valves - Water/Lt. Oil	19	8,760	0.0	0.0052	0.0002	0.0
Connectors - Gas	415	8,760	0.000003	0.011	0.0005	2.50E-06
Connectors - Light Oil	168	8,760	0.0	0.011	0.0005	0.0
Connectors - Heavy Oil	0	8,760	0.0	0.0004	0.00002	0.0
Connectors - Water/ Lt. Oil	32	8,760	0.0	0.0058	0.0002	0.0
Open-Ended Lines - Gas	0	8,760	0.000003	0.11	0.005	0.0
Open-Ended Lines - Light Oil	0	8,760	0.0	0.074	0.003	0.0
Open-Ended Lines - Heavy Oil	0	8,760	0.0	0.0074	0.0003	0.0
Open-Ended Lines - Water/Lt. Oil	0	8760	0.0	0.013	0.0005	0.0
Flanges - Gas	38	8,760	0.000003	0.021	0.0009	4.37E-07
Flanges - Light Oil	54	8,760	0.0	0.0058	0.0002	0.0
Flanges - Heavy Oil	0	8,760	0.0	0.000021	0.000001	0.0
Flanges - Water/Lt. Oil	15	8,760	0.0	0.00015	0.00001	0.0
Other - Gas	56	8,760	0.000003	0.47	0.02	1.44E-05
Other - Light Oil	37	8,760	0.0	0.4	0.02	0.0
Other - Heavy Oil	0.000	8,760	0.0	0.0017	0.00007	0.0
Other - Water/Lt. Oil	8	8,760	0.0	0.74	0.03	0.0
<b>TOTAL H<sub>2</sub>S EMISSIONS (tons/yr)</b>						<b>3.01E-05</b>

<sup>1</sup>H<sub>2</sub>S weight fraction from site-specific analysis

<sup>2</sup>Emission Factors from Appendix B of the WYDEQ C6 S2 Production Facilities Permitting Guidance, September 2013

$$\text{VOC Emissions (tons/yr)} = \frac{\text{Emission Factor (lb/hr)} * \text{Number of Units} * \text{Hours of Operation (hrs/yr)} * \text{VOC Wt. Fraction}}{2,000 \text{ lbs/ton}}$$

Heavy Oil < 20 API Gravity, Light Oil >= 20 API Gravity

Other equipment may include compressors, diaphragms, drains, dump arms, hatches, instruments, meters, pressure relief valves, polished rods, and vents.

Number of components estimated from actual count at a similar, representative facility.

# Natural Gas Fired Separator Emissions

Company: Helis Oil & Gas Company LLC  
 Facility: MBU Hornbuckle E-28/21H  
 Location: Converse County, WY

Heated 3-Phase Separator      500,000      Btu/hr  
 Fuel Heat Value:                    1,375      Btu/scf  
 Annual Operating Rate:            8,760      hrs/yr

## Calculated Fuel Usage

Annual Fuel Usage:                    3.19      MMscf/yr

## Calculated Pollutant Emissions

Pollutant	AP-42 Emission Factor (lbs/MMscf)	Emission Rate (lb/hr)	Emission Rate (tons/yr)
VOC	5.5	0.0036	0.016
NO <sub>x</sub>	100	0.066	0.29
CO	84	0.056	0.24
SO <sub>2</sub>	0.6	0.00040	0.0017
PM	7.6	0.0050	0.022
Benzene	2.10E-03	0.0000014	0.0000061
Formaldehyde	7.50E-02	0.000050	0.00022
Toluene	3.40E-03	0.0000022	0.000010
Total HAPs	1.88	0.0012	0.0054

### Emission Calculation Equation:

$$\text{tons/yr} = [\text{Emission Rate (lbs/hr)} \times \text{Actual Operation (hr/yr)}] / 2,000 \text{ (lbs/ton)}$$

Emission factors were obtained from AP-42, 5th Edition, Section 1.4, Tables 1.4-1, 1.4-2, and 1.4-3, Rev. 7/98

### Additional Notes/Assumptions:

The average gross heating value of natural gas is approximately 1,020 British thermal units per standard cubic foot (Btu/scf). Reference: AP-42, 5th Edition, Section 1.4.1

# Natural Gas Fired Heater Emissions

Company: Helis Oil & Gas Company LLC

Facility: MBU Hornbuckle E-28/21H

Location: Converse County, WY

Heater Treater 1 Heater Rating      1,000,000      Btu/hr

Fuel Heat Value:      1,375      Btu/scf

Annual Operating Rate:      8,760      hrs/yr

## Calculated Fuel Usage

Annual Fuel Usage:      6.37      MMscf/yr

## Calculated Pollutant Emissions

Pollutant	AP-42 Emission Factor (lbs/MMscf)	Emission Rate (lb/hr)	Emission Rate (tons/yr)
VOC	5.5	0.0073	0.032
NO <sub>x</sub>	100	0.13	0.58
CO	84	0.11	0.49
SO <sub>2</sub>	0.6	0.00079	0.0035
PM	7.6	0.010	0.044
Benzene	2.10E-03	0.0000028	0.000012
Formaldehyde	7.50E-02	0.000099	0.00043
Toluene	3.40E-03	0.0000045	0.000020
Total HAPs	1.88	0.0025	0.011

## Emission Calculation Equation:

tons/yr = [Emission Rate (lbs/hr) x Actual Operation (hr/yr)] / 2,000 (lbs/ton)

Emission factors were obtained from AP-42, 5th Edition, Section 1.4, Tables 1.4-1, 1.4-2, and 1.4-3, Rev. 7/98

## Additional Notes/Assumptions:

The average gross heating value of natural gas is approximately 1,020 British thermal units per standard cubic foot (Btu/scf). Reference: AP-42, 5th Edition, Section 1.4.1

# Oil Tank Flashing, Working, and Breathing Emissions

Company: Helis Oil & Gas Company LLC  
 Facility: MBU Hornbuckle E-28/21H  
 Location: Converse County, WY

## Uncontrolled Emissions

Tank Description	VOC (tons/yr)	Benzene (tons/yr)	Toluene (tons/yr)	Ethyl Benzene (tons/yr)	Xylenes (tons/yr)	n-Hexane (tons/yr)	2,2,4 TMP (tons/yr)	Total HAPS (tons/yr)
6-400 bbl Oil tanks	183.521	0.114	0.116	0.002	0.015	1.186	0.031	1.460
<b>Total</b>	<b>183.521</b>	<b>0.114</b>	<b>0.116</b>	<b>0.002</b>	<b>0.015</b>	<b>1.186</b>	<b>0.031</b>	<b>1.460</b>

## Controlled Emissions

Tank Description	VOC (tons/yr)	Benzene (tons/yr)	Toluene (tons/yr)	Ethyl Benzene (tons/yr)	Xylenes (tons/yr)	n-Hexane (tons/yr)	2,2,4 TMP (tons/yr)	Total HAPS (tons/yr)
6-400 bbl Oil tanks	3.67	0.002	0.002	0.00004	0.0003	0.024	0.001	0.029
<b>Total</b>	<b>3.67</b>	<b>0.002</b>	<b>0.002</b>	<b>0.000</b>	<b>0.000</b>	<b>0.024</b>	<b>0.001</b>	<b>0.029</b>

Total Facility Production 254.4 bbl/day (First 30 days of production with 0.6 decline factor)  
 Control Efficiency: 98%

Tank Emissions Calculated Using E&P Tanks 2.0

# Pneumatic Controller Emissions

Company: Helis Oil & Gas Company LLC

Facility: MBU Hornbuckle E-28/21H

Location: Converse County, WY

Number of Controllers: 7  
 Maximum Vent Rate<sup>1</sup>: 6 scfh

Component	Mole Percent	Component Mole Weight (lb/lb-mole)	Component Volume Flow Rate (scfh)	Component Mass Flow Rate (lb/hr)	Component Mass Flow Rate (ton/yr)
Methane	70.5936	16.04	4.24	0.18	0.78
Ethane	14.1240	30.07	0.85	0.067	0.29
Propane	8.3273	44.10	0.50	0.058	0.25
i-Butane	1.0608	58.12	0.064	0.010	0.043
n-Butane	2.4024	58.12	0.144	0.022	0.10
i-Pentane	0.6378	72.15	0.038	0.0073	0.032
n-Pentane	0.5629	72.15	0.034	0.0064	0.028
Hexanes	0.2609	86.18	0.016	0.0036	0.016
Heptanes	0.2676	100.20	0.016	0.0042	0.019
Octanes	0.0973	114.23	0.0058	0.0018	0.0077
Benzene	0.0249	78.11	0.00149	0.00031	0.0013
Toluene	0.0281	92.14	0.00169	0.000409	0.00179
Ethylbenzene	0.0023	106.17	0.0001	0.00004	0.0002
Xylenes	0.0129	106.17	0.0008	0.00022	0.0009
n-Hexane	0.142	86.18	0.00851	0.001933	0.00847
Nitrogen	0.5439	28.01	0.03263	0.002409	0.01055
Carbon Dioxide	0.9111	44.01	0.055	0.0063	0.028
Hydrogen Sulfide	0.0002	34.08	0.00001	0.000001	0.000005
<b>Total VOC per Controller</b>				<b>0.12</b>	<b>0.51</b>
<b>Total HAPs per Controller</b>				<b>0.0029</b>	<b>0.013</b>
<b>Total VOC for all Controllers</b>				<b>0.81</b>	<b>3.56</b>
<b>Total HAPs for all Controllers</b>				<b>0.020</b>	<b>0.089</b>

Notes:

1. Controllers will likely vent less than 6 scfh based on calculations as venting is based on production; however, the maximum allowed vent rate was used to determine potential emissions.

HAPs	lb/hr	tpy
Benzene	2.15E-03	9.43E-03
Toluene	2.87E-03	1.26E-02
Ethylbenzene	2.70E-04	1.18E-03
Xylenes	1.52E-03	6.64E-03
n-Hexane	1.35E-02	5.93E-02

# Emissions Control Unit Emissions

Company: Helis Oil & Gas Company LLC  
 Facility: MBU Hornbuckle E-28/21H  
 Location: Converse County, WY

### Combustor Emissions for Storage Tanks

Truck Loading Flared Gas	0.17	Mscf/day
Storage Tanks Flared Gas	11.16	Mscf/day (Estimated from E&P Tanks V2.0)
Total Flared Gas	11.33	Mscf/day (Estimated from E&P Tanks V2.0)
Storage Tanks Heating Value	2,431	Btu/Scf (Estimated from E&P Tanks V2.0)
Storage Tanks Heat Input Capacity	1.15	MMBtu/hr
Operating Time:	8,760	hr/yr

Pollutant	Emission Factor <sup>1</sup> (lb/MMBtu)	Potential Emission Rate (lbs/hr)	Potential Emission Rate (tons/year)
Particulate Matter (PM)	Negligible, Smokeless Design		
Particulate Matter (PM <sub>10</sub> )	Negligible, Smokeless Design		
Nitrogen Oxides (NO <sub>x</sub> )	0.14	0.16	0.70
Sulfur Oxides (SO <sub>x</sub> )	Negligible - no H2S shown in tank analysis		
Carbon Monoxide (CO)	0.035	0.040	0.18

<sup>1</sup>Emission Factors from Appendix B of the WYDEQ C6 S2 Production Facilities Permitting Guidance, September 2013

### Pilot Emissions

Heating Value:	1375	Btu/scf
Operating Time:	8,760	hr/yr
Total Natural Gas Usage <sup>2</sup> :	0.000011	MMscf/hr

<sup>2</sup> Steffes Flare Pilot light fuel use = 11 scf/hr per combustor

Pollutant	Emission Factor (lb/MMscf)	Potential Emission Rate (lbs/hr)	Potential Emission Rate (tons/year)
Particulate Matter (PM <sub>10</sub> ) <sup>3</sup>	7.6	8.36E-05	0.00037
Particulate Matter (PM <sub>2.5</sub> ) <sup>3</sup>	7.6	8.36E-05	0.00037
Nitrogen Oxides (NO <sub>x</sub> ) <sup>4</sup>	193	2.12E-03	0.0093
Sulfur Dioxide (SO <sub>2</sub> ) <sup>3</sup>	0.6	6.60E-06	0.000029
Carbon Monoxide (CO) <sup>4</sup>	48	5.29E-04	0.0023
Volatile Organic Compounds (VOC) <sup>3</sup>	5.5	6.05E-05	0.00026
Benzene	2.10E-03	2.31E-08	0.0000001
Formaldehyde	7.50E-02	8.25E-07	0.0000036
Toluene	3.40E-03	3.74E-08	0.0000002
HAPs <sup>3</sup>	1.88	2.07E-05	0.000091

<sup>3</sup>Emission Factors from AP-42 Tables 1.4-1, 1.4-2, 1.4-3, and 1.4-4 (7/98).

<sup>4</sup>Emission Factors from Appendix B of the WYDEQ C6 S2 Production Facilities Permitting Guidance, September 2013. NOTE: the emission factors are converted to lb/MMscf by multiplying the WYDEQ emission factor (lb/MMBtu) by the fuel heating value (Btu/scf).

### Total Flare Emissions

Pollutant	Total Potential Emission Rate (pounds/hour)	Total Potential Emission Rate (tons/year)
Particulate Matter (PM <sub>10</sub> )	0.000084	0.00037
Particulate Matter (PM <sub>2.5</sub> )	0.000084	0.00037
Nitrogen Oxides (NO <sub>x</sub> )	0.16	0.71
Sulfur Dioxide (SO <sub>2</sub> )	0.0000066	0.000029
Carbon Monoxide (CO)	0.041	0.18
Volatile Organic Compounds (VOC)	0.000061	0.00026

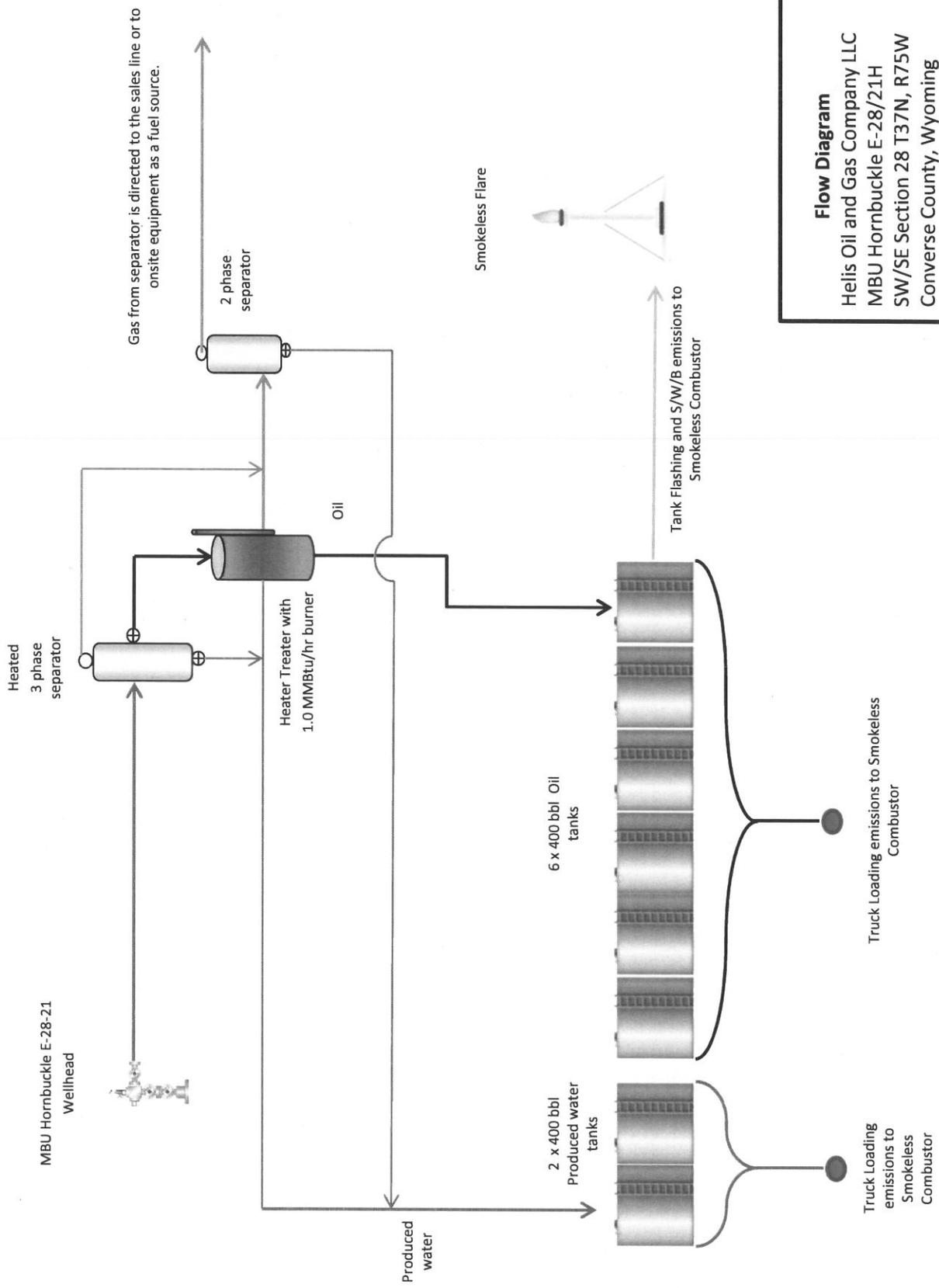
## **Process Description and Flow Diagram**

## Process Description – MBU Hornbuckle E-28/21H

The well site contains an oil well, one (1) three-phase separator with a 0.5 MMBtu/hr burner, one (1) two-phase separator, one (1) heater treater with a 1.0 MMBtu/hr burner, six (6) 400-bbl oil storage tanks, two (2) 400-bbl produced water tanks, one (1) 302 hp natural gas engine, and a flare for emission control.

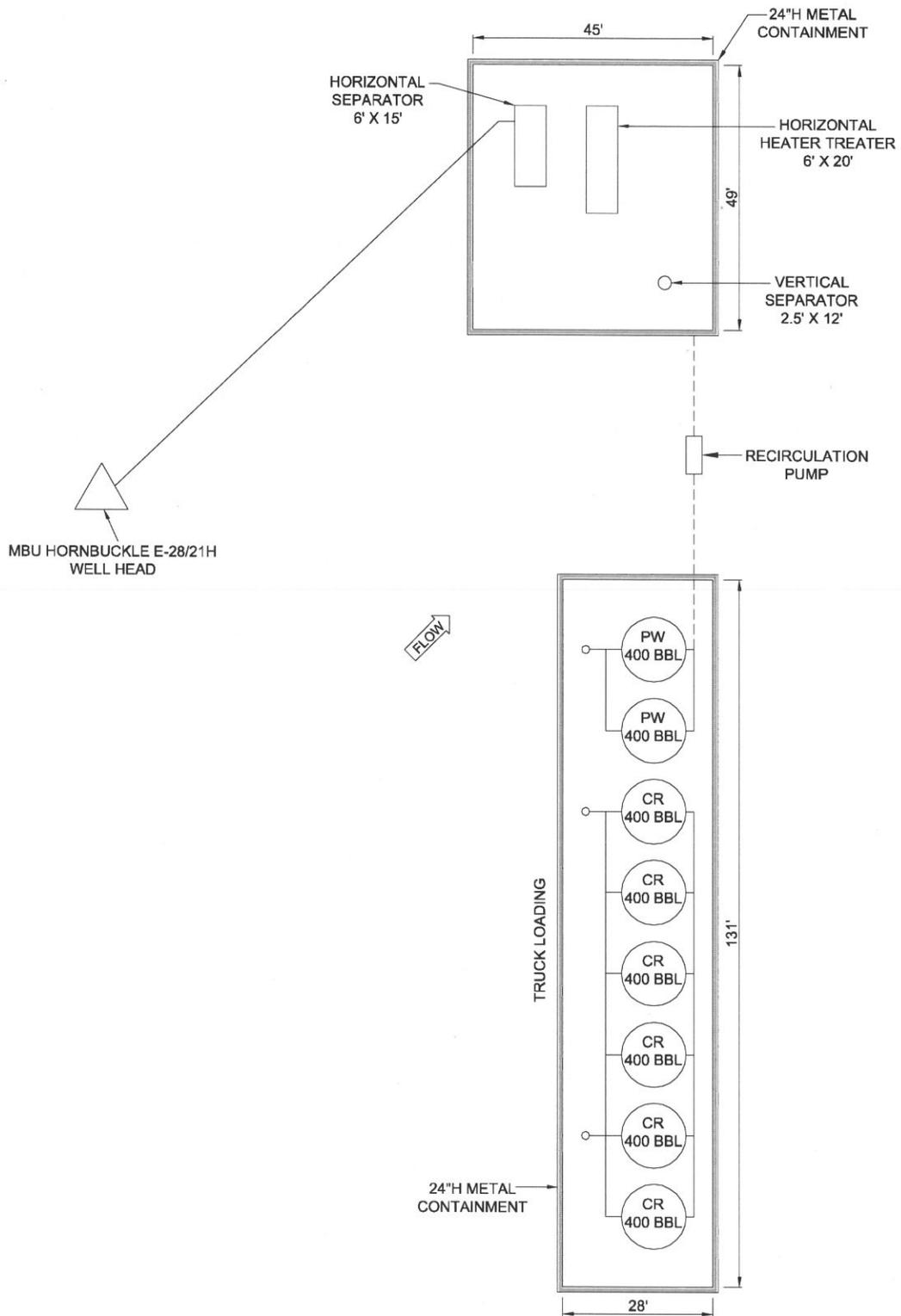
Extracted fluids and gas are initially sent to the three-phase separator and then the heater/treater for separation of oil, water, and gas. The extracted gas is sent through the two phase separator prior to the sales pipeline. Produced water is sent to two (2) 400-bbl produced water tanks. Oil is sent to six (6) 400-bbl storage tanks. As needed, fluids are transported offsite by truck. The 302 hp engine is used to power the pumping unit.

Vent gas from the storage tanks and from truck loading operations are routed to the smokeless flare with 98% control efficiency. The flare may also be used for emergency purposes.



**Flow Diagram**

Helis Oil and Gas Company LLC  
 MBU Hornbuckle E-28/21H  
 SW/SE Section 28 T37N, R75W  
 Converse County, Wyoming



**LEGEND:**

- ABOVE GROUND LINES
- BURIED LINES

	<b>MBU HORNBUCKLE E-28/21H</b>
	Helis Oil and Gas Company, L.L.C. Sec. 28, T37N, R75W Converse County, WY
N.T.S.	
M.G.	
MAR 2015	
REVISED:	

## **Supporting Documentation**

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

\*\*\*\*\*  
 Project File : W:\Helis Oil & Gas - 650\Air Permitting\WY Air Permitting\MBU Hornbuckle E-28-21\Fac  
 Flowsheet Selection : Oil Tank with Separator  
 Calculation Method : RVP Distillation  
 Control Efficiency : 98.0%  
 Known Separator Stream : Low Pressure Oil  
 Entering Air Composition : No  
  
 Well Name : MBU Hornbuckle E-28-21  
 Date : 2015.05.12

\*\*\*\*\*  
 \* Data Input \*

Separator Pressure : 29.00[psig]  
 Separator Temperature : 99.00[F]  
 Ambient Pressure : 12.14[psia]  
 Ambient Temperature : 45.05[F]  
 C10+ SG : 0.81566  
 C10+ MW : 229.52

-- Low Pressure Oil -----

No.	Component	mol %
1	H2S	0.0000
2	O2	0.0000
3	CO2	0.0208
4	N2	0.0023
5	C1	0.5867
6	C2	1.7195
7	C3	4.3467
8	i-C4	1.3851
9	n-C4	4.9224
10	i-C5	3.2607
11	n-C5	3.5918
12	C6	3.1981
13	C7	5.4170
14	C8	1.7424
15	C9	0.2367
16	C10+	65.5038
17	Benzene	0.2580
18	Toluene	0.8870
19	E-Benzene	0.0425
20	Xylenes	0.3850
21	n-C6	2.3438
22	224Trimethylp	0.1497

-- Sales Oil -----

Production Rate : 254.4[bbbl/day]  
 Days of Annual Operation : 365 [days/year]  
 API Gravity : 43.5  
 Reid Vapor Pressure : 6.65[psia]

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

-- Emission Summary -----

Item	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]	Controlled [ton/yr]	Controlled [lb/hr]
Total HAPs	1.460	0.333	0.029	0.007
Total HC	228.543	52.179	4.571	1.044

VOCs, C2+	221.594	50.592	4.432	1.012
VOCs, C3+	183.521	41.900	3.670	0.838

Uncontrolled Recovery Info.

Vapor	11.1600	[MSCFD]
HC Vapor	11.1300	[MSCFD]
GOR	43.86	[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	0.676	0.154	0.676	0.154
4	N2	0.048	0.011	0.048	0.011
5	C1	6.949	1.587	0.139	0.032
6	C2	38.073	8.692	0.761	0.174
7	C3	108.155	24.693	2.163	0.494
8	i-C4	15.572	3.555	0.311	0.071
9	n-C4	36.640	8.365	0.733	0.167
10	i-C5	10.175	2.323	0.204	0.046
11	n-C5	8.073	1.843	0.161	0.037
12	C6	2.079	0.475	0.042	0.009
13	C7	1.227	0.280	0.025	0.006
14	C8	0.129	0.029	0.003	0.001
15	C9	0.006	0.001	0.000	0.000
16	C10+	0.001	0.000	0.000	0.000
17	Benzene	0.114	0.026	0.002	0.001
18	Toluene	0.116	0.026	0.002	0.001
19	E-Benzene	0.002	0.000	0.000	0.000
20	Xylenes	0.015	0.003	0.000	0.000
21	n-C6	1.186	0.271	0.024	0.005
22	224Trimethylp	0.031	0.007	0.001	0.000
	Total	229.267	52.344	4.585	1.047

-- 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	0.0208	0.0075	0.0000	0.4580	0.1674	0.2856
4	N2	28.01	0.0023	0.0001	0.0000	0.0743	0.0023	0.0316
5	C1	16.04	0.5867	0.0814	0.0000	17.1392	1.8285	8.0572
6	C2	30.07	1.7195	0.8652	0.0048	29.7046	19.3342	23.5531
7	C3	44.10	4.3467	3.4971	1.1049	32.1766	54.8480	45.6248
8	i-C4	58.12	1.3851	1.2972	1.1025	4.2628	5.4781	4.9837
9	n-C4	58.12	4.9224	4.7475	4.3880	10.6508	12.4640	11.7263
10	i-C5	72.15	3.2607	3.2831	3.3107	2.5258	2.6903	2.6234
11	n-C5	72.15	3.5918	3.6400	3.7104	2.0117	2.1294	2.0815
12	C6	86.16	3.1981	3.2821	3.4131	0.4450	0.4709	0.4604
13	C7	100.20	5.4170	5.5755	5.8240	0.2262	0.2414	0.2352
14	C8	114.23	1.7424	1.7950	1.8775	0.0206	0.0222	0.0215
15	C9	128.28	0.2367	0.2439	0.2552	0.0009	0.0010	0.0010
16	C10+	229.52	65.5038	67.5035	70.6482	0.0001	0.0001	0.0001
17	Benzene	78.11	0.2580	0.2651	0.2761	0.0262	0.0278	0.0271
18	Toluene	92.13	0.8870	0.9134	0.9548	0.0225	0.0241	0.0235
19	E-Benzene	106.17	0.0425	0.0438	0.0458	0.0003	0.0003	0.0003
20	Xylenes	106.17	0.3850	0.3967	0.4150	0.0025	0.0027	0.0026
21	n-C6	86.18	2.3438	2.4078	2.5078	0.2471	0.2621	0.2560
22	224Trimethylp	114.24	0.1497	0.1541	0.1611	0.0049	0.0052	0.0051
	MW		175.64	179.81	186.08	38.92	45.21	42.65
	Stream Mole Ratio		1.0000	0.9704	0.9272	0.0296	0.0432	0.0728
	Heating Value	[BTU/SCF]				2225.48	2571.47	2430.72
	Gas Gravity	[Gas/Air]				1.34	1.56	1.47
	Bubble Pt. @ 100F	[psia]	47.59	22.93	8.59			
	RVP @ 100F	[psia]	18.82	13.32	6.98			
	Spec. Gravity @ 100F		0.718	0.720	0.723			



GAS MEASUREMENT EMISSIONS TESTING LABORATORY  
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 www.precision-labs.com

**Client:** HELIS **Analysis Date:** 4/22/2015  
**Sample ID:** HORNBUCKLE E-28-21H **Date Sampled:** 4/22/2015  
**Unique #:** N/A **Purpose:** SPECIAL REQ  
**Sample Temperature:** 94 DEG F **Sample Pressure:** 92 PSI  
**Sampled By:** JACOB MCKERCHIE **Type Sample:** ON SITE  
**County:** CONVERSE

Components	Mole %	Weight %	Liq. Vol. %
Carbon Dioxide.....	0.9111	1.7094	0.7717
Hydrogen Sulfide.....	0.0002	0.0003	0.0001
Nitrogen.....	0.5439	0.6496	0.2970
Methane.....	70.5936	48.2807	59.3980
Ethane.....	14.1240	18.1056	18.7473
Propane.....	8.3273	15.6543	11.3864
iso-Butane.....	1.0608	2.6285	1.7229
n-Butane.....	2.4024	5.9529	3.7591
iso-Pentane.....	0.6378	1.9618	1.1577
n-Pentane.....	0.5629	1.7314	1.0127
Cyclopentane.....	0.0396	0.1185	0.0583
n-Hexane.....	0.1419	0.5213	0.2896
Cyclohexane.....	0.0175	0.0628	0.0295
Other Hexanes .....	0.2038	0.7486	0.4159
Heptanes.....	0.2108	0.9005	0.4827
Methylcyclohexane.....	0.0568	0.2378	0.1133
2,2,4-Trimethylpentane...	0.0010	0.0049	0.0026
Benzene.....	0.0249	0.0829	0.0346
Toluene.....	0.0281	0.1104	0.0467
Ethylbenzene.....	0.0023	0.0104	0.0044
Xylenes.....	0.0129	0.0584	0.0248
C8+ Heavies.....	0.0963	0.4690	0.2449
<b>Totals .....</b>	<b>100.0000</b>	<b>100.0000</b>	<b>100.0000</b>

**ADDITIONAL BETX DATA**

<u>Components</u>	<u>Mole %</u>	<u>Weight %</u>	<u>Liq. Vol. %</u>
Cyclopentane	0.0396	0.1185	0.0583
Cyclohexane	0.0175	0.0628	0.0295
2-Methylpentane	0.1283	0.4712	0.2618
3-Methylpentane	0.0755	0.2774	0.1541
n-Hexane	0.1419	0.5213	0.2896
Methylcyclohexane	0.0568	0.2378	0.1133
2,2,4-Trimethylpentane	0.0010	0.0049	0.0026
Benzene	0.0249	0.0829	0.0346
Toluene	0.0281	0.1104	0.0467
Ethylbenzene	0.0023	0.0104	0.0044
m-Xylene	0.0020	0.0093	0.0039
p-Xylene	0.0087	0.0395	0.0168
o-Xylene	0.0021	0.0096	0.0041

<b>SPECIFIC GRAVITY @ 60/60 F, calculated.....</b>	<b>0.8099</b>
<b>TOTAL GPM (Ethane Inclusive).....</b>	<b>7.944</b>
<b>CALCULATED BTU / REAL CF @ 14.73 PSIA, dry basis.....</b>	<b>1384.095</b>
<b>CALCULATED BTU / REAL CF @ 14.73 PSIA, wet basis.....</b>	<b>1360.753</b>
<b>AVERAGE MOLECULAR WEIGHT.....</b>	<b>23.457</b>
<b>MOLAR MASS RATIO.....</b>	<b>0.8099</b>
<b>RELATIVE DENSITY ( G x Z (Air) / Z ), calculated.....</b>	<b>0.8136</b>
<b>IDEAL GROSS HEATING VALUE, BTU / IDEAL CF @ 14.696 PSIA.....</b>	<b>1374.542</b>
<b>COMPRESSIBILITY FACTOR (Z).....</b>	<b>0.99538</b>
<b>PROPANE GPM .....</b>	<b>2.2883</b>
<b>BUTANE GPM .....</b>	<b>1.1017</b>
<b>GASOLINE GPM (PENTANE AND HEAVIER) .....</b>	<b>0.7866</b>
<b>TOTAL ACID GAS MOLE %.....</b>	<b>0.9113</b>
<b>H2S MOLE % .....</b>	<b>0.0002</b>
<b>H2S PPM .....</b>	<b>2</b>
<b>VOC WEIGHT FRACTION .....</b>	<b>0.313</b>

NOTATION: ALL CALCULATIONS PERFORMED USING PHYSICAL CONSTANTS FROM GPA 2145-09, THE TABLES OF PHYSICAL CONSTANTS FOR HYDROCARBONS AND OTHER COMPOUNDS OF INTEREST TO THE NATURAL GAS INDUSTRY.



**EXTENDED HYDROCARBON LIQUID STUDY  
 CERTIFICATE OF ANALYSIS**

Company: **Helis Oil and Gas** Sample Name: **MBU Hornbuckle E-28/21H**

Date Sampled: 04/22/2015 Sample Number: 15042224-02  
 Sample Location: Wyoming Date Tested: 04/27/2015  
 Sample Pressure: 29 PSI Test Method: GPA 2186M  
 Sample Temperature: 99 DEG F  
 County: Converse Date Reported: 04/27/2015

Sampling Method: GPA-2174 Note: Due to the nature of H2S, the values of  
 Type Sample: SPOT H2S reported may be lower than actual.

Components	Mole %	Weight %	Liq. Vol. %
Hydrogen Sulfide	0.0000	0.000	0.000
Oxygen	0.0000	0.000	0.000
Carbon Dioxide	0.0208	0.005	0.005
Nitrogen	0.0023	0.000	0.000
Methane	0.5867	0.054	0.140
Ethane	1.7195	0.294	0.647
Propane	4.3467	1.091	1.685
iso-Butane	1.3851	0.458	0.638
n-Butane	4.9224	1.629	2.183
iso-Pentane	3.2607	1.339	1.678
n-Pentane	3.5918	1.475	1.832
Hexanes	3.1981	1.569	1.850
Heptanes	5.4170	3.090	3.516
Octanes	1.7424	1.133	1.256
Nonanes	0.2367	0.173	0.187
Decanes+	65.5038	85.601	82.166
Benzene	0.2580	0.115	0.101
Toluene	0.8870	0.465	0.418
Ethylbenzene	0.0425	0.026	0.023
Xylenes	0.3850	0.233	0.210
n-Hexane	2.3438	1.150	1.356
2,2,4-Trimethylpentane	0.1497	0.097	0.109
Totals	100.000	100.000	100.000

### ADDITIONAL BTEX DATA

Components	Mole %	Weight %	Liq. Vol. %
2-Methylpentane	2.287	1.122	1.323
3-Methylpentane	0.911	0.447	0.527
n-Hexane	2.344	1.150	1.356
2,2,4-Trimethylpentane	0.150	0.097	0.109
Benzene	0.258	0.115	0.101
Toluene	0.887	0.465	0.418
Ethylbenzene	0.043	0.026	0.023
m-Xylene	0.044	0.027	0.024
p-Xylene	0.275	0.166	0.150
o-Xylene	0.065	0.040	0.036

RELATIVE SPECIFIC GRAVITY OF DECANES+ (C10+) FRACTION, calculated	<b>0.81566</b>
AVERAGE MOLECULAR WEIGHT	<b>175.633</b>
AVERAGE MOLECULAR WEIGHT OF DECANES+ (C10+) FRACTION, calculated	<b>229.520</b>
TRUE VAPOR PRESSURE AT 100 F, PSIA, calculated	<b>56.492</b>
AVERAGE BOILING POINT, F, calculated	<b>387.646</b>
CUBIC FEET OF GAS / GALLON OF LIQUID, as Ideal Gas, calculated	<b>18.286</b>
BTU / GALLON OF LIQUID AT 14.73 PSIA, calculated	<b>123,768.29</b>
LBS / GALLON OF LIQUID, calculated	<b>6.528</b>

NOTATION: ALL CALCULATIONS PERFORMED USING PHYSICAL CONSTANTS FROM GPA 2145-09, THE TABLES OF PHYSICAL CONSTANTS FOR HYDROCARBONS AND OTHER COMPOUNDS OF INTEREST TO THE NATURAL GAS INDUSTRY.

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**FLASHED CRUDE OIL LIQUID STUDIES  
CERTIFICATE OF ANALYSIS**

Sample Name: **MBU Hornbuckle E-28/21H**  
Sample Number: 15042224-02

<b>TEST PERFORMED</b>	<b>RESULTS</b>	<b>DATE TESTED</b>
<b>API GRAVITY AT 60/60 F, (ASTM D-7777), calculated from SG</b>	43.5	04/27/2015
<b>REID VAPOR PRESSURE (ASTM D5191), PSI AT 100 F, measured</b>	6.65	04/27/2015