



September 16, 2016

Oil and Gas Stationary Sources Permitting
Colorado Department of Public Health and Environment
APCD-SS-B1
4300 Cherry Creek Drive South
Denver, CO 80246-1530

**RE: Air Permit Application
Callaway 3-33 Pad (Oil and Gas Production Well Pad)
Mustang Creek Operating LLC, Elbert County**

To Whom it May Concern:

On behalf of Mustang Creek Operating LLC (Mustang Creek), LT Environmental, Inc. (LTE) is submitting the attached permit application for emission sources at the Callaway 3-33 Pad. The Callaway 3-33 Pad is owned and operated by Mustang Creek and is located in the NWSE of Section 3, Township 13 South, Range 58 West in Elbert County, Colorado. The well was completed and began producing on May 13, 2016.

Produced gas at this location is routed to a natural gas pumping unit on location. Engine horsepower (hp) is limited by a governor to 49hp. Any natural gas not used as fuel is burned by an enclosed flare on location and is controlled by 95 percent. As the natural gas engine is below 50hp, this engine is permit exempt and APEN required.

The enclosed produced gas flare is conservatively estimated to be APEN and Permit applicable, therefore Mustang Creek requests issuance of an individual permit for this source.

Condensate and produced water tanks are controlled by an enclosed VOC combustor. Emissions were estimated using site-specific emission factors for the condensate tank and State approved emission factors for the produced water tank. These sources are both APEN and Permit applicable, therefore Mustang Creek is requesting issuance of GP08 permits for both the condensate tank and produced water tank.

Hydrocarbon liquid loadout emissions were estimated using State approved emission factors. Emissions associated with loadout are estimated to be lower than the threshold for an APEN or a Permit; this source is therefore APEN and Permit exempt.

There are other APEN and Permit exempt emission sources at this location; calculations for these sources are included in the permit application, and are accounted for on form APCD-102.



Included with this submittal is a check in the amount of \$1,111.60 for the four APEN filing fees (4 x 152.90) and two storage tank general permit fees (2 x \$250). Please find attached all necessary calculations and forms. We request that the Division provide the AIRS ID numbers and verification of the status of each source, by return mail to the listed Permit Contact. If you have any questions or need additional information, please contact me at (303) 962-5559, or by email at cdimarco@ltenv.com.

Sincerely,
LT ENVIRONMENTAL, INC.

A handwritten signature in black ink, appearing to read "Chris DiMarco", is written over a light gray rectangular background.

Christopher A. DiMarco
Project Air Quality Scientist

Cc: Jim Halvatzis, Mustang Creek



Oil & Gas Industry Construction Permit Application Completeness Checklist

Ver. November 29, 2012

Company Name: Mustang Creek Operating LLC

Source Name: Callaway 3-33

Date: 9/16/2016

Are you requesting a facility wide permit for multiple emissions points? Yes ☐ No ☒

In order to have a complete application, the following attachments must be provided, unless stated otherwise. If application is incomplete, it will be returned to sender and filing fees will not be refunded.

Attachment	Application Element	Applicant	APCD
A	APEN Filing Fees	<input checked="" type="checkbox"/>	<input type="checkbox"/>
B	Air Pollutant Emission Notice(s) (APENs) & Application(s) for Construction Permit(s) – APCD Form Series 200	<input checked="" type="checkbox"/>	<input type="checkbox"/>
C	Emissions Calculations and Supporting Documentation	<input checked="" type="checkbox"/>	<input type="checkbox"/>
D	Company Contact Information - Form APCD-101	<input checked="" type="checkbox"/>	<input type="checkbox"/>
E	Ambient Air Impact Analysis <input type="checkbox"/> Check here if source emits only VOC (Attachment E not required)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
F	Facility Emissions Inventory – Form APCD-102 <input type="checkbox"/> Check here if single emissions point source (Attachment F not required)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
G	Process description, flow diagram and plot plan of emissions unit and/or facility <input type="checkbox"/> Check here if single emissions point source (Attachment G not required)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
H	Operating & Maintenance (O&M) Plan – APCD Form Series 300 <input type="checkbox"/> Check here if true minor emissions source or application is for a general permit (Attachment H not required)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
I	Regulatory Analysis <input checked="" type="checkbox"/> Check here to request APCD to complete regulatory analysis (Attachment I not required)	<input type="checkbox"/>	<input type="checkbox"/>
J	Colorado Oil and Gas Conservation Commission (COGCC) 805 Series Rule Requirements– Form APCD-105 <input checked="" type="checkbox"/> Check here if source is not subject to COGCC 805 Series requirements (Attachment J not required)	<input type="checkbox"/>	<input type="checkbox"/>

Send **Complete** Application to: **Colorado Department of Public Health & Environment**
APCD-SS-B1
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

Check box if facility is an existing Title V source: ☐ Send an additional application copyCheck box if refined modeling analysis included: ☐ Send an additional application copyCheck box if application is for major NA NSR or PSD permit: ☐ Send eight (8) total application copies

**Company Contact Information Form**

Ver. September 10, 2008

Company Name: Mustang Creek Operating LLC**Source Name:** Callaway 3-33

Permit Contact¹:	Jim Halvatzis			
Address:	5251 DTC Parkway, Suite 800			
	Street			
	Greenwood Village	CO	80111	
	City	State	Zip	
Phone Number:	(303) 923-2447			
Fax Number:	N/A			
E-mail:	jhalvatzis@nexgenoilandgas.com			

Compliance Contact²:	Jim Halvatzis			
Address:	5251 DTC Parkway, Suite 800			
	Street			
	Greenwood Village	CO	80111	
	City	State	Zip	
Phone Number:	(303) 923-2447			
Fax Number:	N/A			
E-mail:	jhalvatzis@nexgenoilandgas.com			

Billing Contact: (Permit Fees)³	Jim Halvatzis			
Address:	5251 DTC Parkway, Suite 800			
	Street			
	Greenwood Village	CO	80111	
	City	State	Zip	
Phone Number:	(303) 923-2447			
Fax Number:	N/A			
E-mail:	jhalvatzis@nexgenoilandgas.com			

Billing Contact: (Annual Fees)⁴	Jim Halvatzis			
Address:	5251 DTC Parkway, Suite 800			
	Street			
	Greenwood Village	CO	80111	
	City	State	Zip	
Phone Number:	(303) 923-2447			
Fax Number:	N/A			
E-mail:	jhalvatzis@nexgenoilandgas.com			

Check how would you like to receive your permit fee invoice?

Mail: ☒E-mail: ☐Fax: ☐Footnotes:¹ The permit contact should be the point of contact for technical information contained in the permit application. This may be a company representative or a consultant.² The compliance contact should be the point of contact for discussing inspection and compliance at the permitted facility.³ The billing contact (Permit fees) should be the point of contact that should receive the invoice for fees associated with processing the permit application & issuing the permit. (Reg. 3, Part A, Section VI.B)⁴ The billing contact (Annual fees) should be the point of contact that should receive the invoices issued on an annual basis for fees associated with actual emissions reported on APENs for the facility. (Reg. 3, Part A, Section VI.C)

**NOTICE OF START-UP**

Ver. October 6, 2010

NOTICE REQUIRED WITHIN 15 DAYS FOLLOWING STARTUP OF ALL NEW SOURCES

Per Colorado Regulation 3, Part B, Section III.G.1 operators of air pollution emissions sources who obtain a construction permit which authorizes submittal of a "Notice of Startup" within 15 calendar days of commencement of operation shall file this form with the Air Pollution Control Division. It is a violation of your permit if you do not report the start-up date of a new emission source within 15 calendar days of commencement of operation. If multiple pieces of equipment (i.e. "emissions points") covered by a single permit (i.e. "facility-wide permit") will have different start-up dates, you must file a separate Notice of Start-up for each emissions point.

Notification of start-up may be accomplished by completing the form below and returning it to:

Colorado Department of Public Health & Environment
APCD-SS-B1
4300 Cherry Creek Drive South
Denver, CO 80246-1530

Please contact the Division immediately at (303) 692-3150 if you have any questions or problems concerning this requirement.

PERMIT NUMBER: Pending
 ADDRESS OR LOCATION: Callaway 3-33 (Temporary Facility)
NWSE Sec 3 T13S R58W

EQUIPMENT DESCRIPTION^A:

AIRS ID^B Description

<u>Pending</u>	<u>Condensate Storage Tanks</u>
<u>Pending</u>	<u>Produced Gas Venting/Flaring</u>

Footnotes:

^A Please provide specific details of equipment reporting startup as required by the permit including: make, model and serial numbers. Include AIRS IDs for each emissions point description supplied.

^B The AIRS ID for your emissions source(s) may be found at the bottom left corner of each page of your permit or in the equipment description(s). Please include all ten digits for the County/Plant/Point (i.e. 123/4357/002).

Operation of the emission source(s) to which the above permit number is assigned began on May 13, 2016
 Date

Mustang Creek Operating LLC
 COMPANY

Jim Halvatzis
 APPLICANT'S NAME (PLEASE PRINT)

Jim Halvatzis
 PERSON TO CONTACT FOR VERIFICATION OF STARTUP DATE

APPLICANT'S SIGNATURE

TELEPHONE NUMBER OF CONTACT PERSON

Senior Landman
 POSITION OR TITLE

DATE

AIR POLLUTANT EMISSION NOTICE (APEN) & Application for Construction Permit – Condensate Storage Tank(s)¹

Permit Number: _____

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

Emission Source AIRS ID: _____ / _____ / _____

Facility Equipment ID: **TK-1** [Provide Facility Equipment ID to identify how this equipment is referenced within your organization.]

Section 01 – Administrative Information

Company Name: **Mustang Creek Operating LLC** NAICS, or SIC Code: **211111**
Source Name: **Calloway 3-33**
Source Location: **NWSE Sec. 3 T13S R58W** County: **Elbert**
Elevation: **5,773** Feet
Mailing Address: **5251 DTC Parkway, Suite 800** ZIP Code: **80111**
Greenwood Village, CO
Person To Contact: **Jim Halvatzis** Phone Number: **(303) 923-2447**
E-mail Address: **jhalvatzis@nexgenoilandgas.com** Fax Number: _____

Section 03 – General Information

For existing sources, operation began on: _____ / _____ / _____
This Storage Tank is Located at: ☒ Exploration & Production (E&P) Site ☐ Midstream or Downstream (Non-E&P) Site
Will this equipment be operated in any NAAQS nonattainment area? ☐ Yes ☒ No
Is actual annual average hydrocarbon liquid throughput ≥ 500 bbl/day? ☐ Yes ☒ No
▶ Are these condensate tanks subject to Colorado Oil and Gas Conservation Commission (COGCC) 805 series rules? If so, submit Form APCD-105.
▶ Are you requesting ≥ 6 ton/yr VOC emissions, or are uncontrolled actual emissions ≥ 6 ton/yr?

General description of equipment purpose: **Storage of condensates from production wells.**

Section 04 – Storage Tank(s) Information

Condensate Requested Permit Limit: **10,476** bbl/year
Throughput: Actual: **8,717** bbl/year Actual While Controls Operational: **8,717** bbl/year
Average API Gravity of Sales Oil: _____ degrees RVP of Sales Oil _____
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)
	1	500	05/2016	05/2016

Wells Served by this Storage Tank or Tank Battery (E&P Sites Only)

API Number	Name of Well	Newly Reported Well
05 - 039 - 06680	Calloway 3-33	<input checked="" type="checkbox"/>
- -		<input type="checkbox"/>
- -		<input type="checkbox"/>
- -		<input type="checkbox"/>
- -		<input type="checkbox"/>

Section 02 – Requested Action (Check applicable request boxes)

- ☐ Request for NEW INDIVIDUAL permit
☒ Request for coverage under GENERAL PERMIT
☐ GP01 ☒ GP08
☐ Request MODIFICATION to existing INDIVIDUAL permit (check boxes below)
☐ Change process or equipment ☐ Change company name
☐ Change permit limit ☐ Transfer of ownership ☐ Other
☐ APEN Submittal for Permit Exempt/Grandfathered source
☐ APEN Submittal for update only (Please note blank APEN's will not be accepted)

Addl. Info. & Notes: _____

For new or reconstructed sources, the projected startup date is: **05** / **13** / **2016**
Normal Hours of Source Operation: **24** hours/day **7** days/week **52** weeks/year
Are Flash Emissions anticipated at these tanks ☒ Yes ☐ No
If "yes", identify the stock tank gas-to-oil ratio: **0.06** m³/liter
☐ Yes ☒ No
☒ Yes ☐ No

Colorado Department of Public Health and Environment

Air Pollution Control Division (APCD) This notice is valid for five (5) years. Submit a revised APEN prior to expiration of five-year term, or when a significant change is made (increase production, new equipment, change in fuel type, etc).

Mail this form along with a check for \$152.90 per APEN for non-E&P, midstream and downstream sources or \$152.90 for up to five (5) APENs for E&P sources and \$250 for each general permit registration to:

**Colorado Department of Public Health & Environment
APCD-SS-B1
4300 Cherry Creek Drive South
Denver, CO 80246-1530**

For guidance on how to complete this APEN form:

Air Pollution Control Division: (303) 692-3150
Small Business Assistance Program (SBAP): (303) 692-3148 or (303) 692-3175

APEN forms: <http://www.colorado.gov/cdphe/oilgasAPENS>

Application status: <http://www.colorado.gov/cdphe/permitstatus>

AIR POLLUTANT EMISSION NOTICE (APEN) & Application for Construction Permit – Condensate Storage Tank(s)¹

Permit Number: _____

Emission Source AIRS ID: _____ / _____ / _____

Section 05 – Stack Information (For Midstream sites only)

Operator Stack ID No.	Stack Base Elevation (feet)	Stack Discharge Height Above Ground Level (feet)	Temp. (°F)	Flow Rate (ACFM)	Velocity (ft/sec)	Moisture (%)

Direction of stack outlet (**check one**): ☐ Vertical ☐ Vertical with obstructing raincap

Exhaust Opening Shape & Size (**check one**): ☐ Circular: Inner Diameter (inches) = _____

Section 06 – Stack (Source, if no combustion) Location (Datum & either Lat/Long or UTM)

Horizontal Datum (NAD27, NAD83, WGS84)	UTM Zone (12 or 13)	UTM Easting or Longitude (meters or degrees)	UTM Northing or Latitude (meters or degrees)	Method of Collection for Location Data (e.g. map, GPS, GoogleEarth)
NAD83		-10387433	38.94497	COGCC

☐ Horizontal ☐ Down ☐ Other (Describe): _____

☐ Other: Length (inches) = _____ Width (inches) = _____

Section 07 – Control Device Information

<input type="checkbox"/> Vapor Recovery Unit (VRU) used for control of the Storage Tank(s) Size: _____ Make/Model: _____ Requested VOC & HAP Control Efficiency: _____ % Annual time that VRU is bypassed (emissions vented): _____ %	<input checked="" type="checkbox"/> Combustion Device used for control of the Storage Tank(s) Rating: <u>TBD</u> MMBtu/hr Type: <u>Enclosed VOC</u> Make/Model <u>TBD</u> VOC & HAP Control Efficiency: Requested: <u>95</u> % Manufacturer Guaranteed: <u>98</u> % Minimum temp. to achieve requested control: _____ °F Waste gas heat content: <u>2110</u> Btu/scf Constant pilot light? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Pilot burner rating: _____ MMBtu/hr <input type="checkbox"/> Describe Any Other: _____
<input type="checkbox"/> Closed loop system used for control of the storage tank(s) Description: _____	

Section 08 – 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)? _____ psig

Please describe the separation process between the well and the storage tanks: Treatment in 3-phase separator

Section 09 – Emissions Inventory Information & Emission Control Information

☐ Emission Factor Documentation attached Data year for actual calendar yr. emissions below & throughput in Sec. 04 (e.g. 2007): 2016

Pollutant	Emission Factor		Actual Calendar Year Emission ²		Requested Permitted Emissions		Emission Factor Data Source
	Uncontrolled Basis	Units	Uncontrolled (Tons/Year)	Controlled (Tons/Year)	Uncontrolled (Tons/Year)	Controlled (Tons/Year)	
NO _x	N/A	N/A	N/A	N/A	N/A	N/A	N/A
VOC	2.298	lb/bbl	10.02	0.50	12.04	0.60	See Calcs
CO	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzene	0.009	lbs/bbl	0.04	0.00	0.05	0.00	See Calcs
Toluene	0.0038	lbs/bbl	0.02	0.00	0.02	0.00	See Calcs
Ethylbenzene	0.0004	lbs/bbl	0.00	0.00	0.00	0.00	See Calcs
Xylenes	0.0010	lbs/bbl	0.00	0.00	0.00	0.00	See Calcs
n-Hexane	0.0333	lbs/bbl	0.15	0.01	0.17	0.01	See Calcs
2,2,4-Trimethylpentane	0.0009	lbs/bbl	0.00	0.00	0.00	0.00	See Calcs

Please use the APCD Non-Criteria Reportable Air Pollutant Addendum form to report pollutants not listed above.

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 GP01 or GP08, I further certify that this source is and will be operated in full compliance with each condition of the applicable general permit.

Signature of Person Legally Authorized to Supply Data	Date	Jim Halvatzis Name of Legally Authorized Person (Please print)	Senior Landman Title
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¹ You may be charged an additional APEN fee for APEN re-submittal due to incorrectly filled-out APEN or missing information.

² Annual emissions fees will be based on actual emissions reported here.

Additional Information Required:	<input type="checkbox"/>	Attach a pressurized pre-flash condensate extended liquids analysis, RVP & API analysis of the post-flash oil		
	<input type="checkbox"/>	Attach E&P Tanks input & emission estimate documentation (or equivalent simulation report/test results)	<input checked="" type="checkbox"/>	Check box to request copy of draft permit prior to issuance.
	<input type="checkbox"/>	Attach EPA TANKS emission analysis if emission estimates do not contain working/breathing losses	<input type="checkbox"/>	Check box to request copy of draft permit prior to public notice.

AIR POLLUTANT EMISSION NOTICE (APEN) & Application for Construction Permit – Produced Water Storage Tank(s)¹

Permit Number: _____

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

Emission Source AIRS ID: _____ / _____ / _____

Facility Equipment ID: **PW-1** [Provide Facility Equipment ID to identify how this equipment is referenced within your organization.]

Section 01 – Administrative Information

Company Name: **Mustang Creek Operating LLC** NAICS, or SIC Code: **211111**
Source Name: **Calloway 3-33**
Source Location: **NWSE Sec. 3 T13S R58W** County: **Elbert**
Elevation: **5,733** Feet
Mailing Address: **5251 DTC Parkway, Suite 800** ZIP Code: **80111**
Greenwood Village, CO
Person To Contact: **Jim Halvatzis** Phone Number: **(303) 923-2447**
E-mail Address: **jhalvatzis@nexgenoilandgas.com** Fax Number: _____

Section 03 – General Information

For existing sources, operation began on: _____ / _____ / _____
This Storage Tank is Located at: ☒ Exploration & Production (E&P) Site ☐ Midstream or Downstream (Non-E&P) Site
Will this equipment be operated in any NAAQS nonattainment area? ☐ Yes ☒ No
▶ Are these produced water tanks located at a commercial facility that accepts oil production wastewater for processing?
▶ Do these storage tanks contain less than 1% by volume crude oil on an annual average basis?
▶ Are these produced water tanks subject to Colorado Oil and Gas Conservation Commission (COGCC) 805 series rules? If so, submit Form APCD-105.
▶ Are you requesting ≥ 6 ton/yr VOC emissions, or are uncontrolled actual emissions ≥ 6 ton/yr?

General description of equipment purpose: **Storage of produced water from production well.**

Section 04 – Storage Tank(s) Information

Produced Water Requested Permit Limit: **13,037** bbl/year
Throughput: Actual: **10,864** bbl/year Actual While Controls Operational: **10,864** bbl/year
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)
	1	500	05/2016	05/2016

Wells Serviced by this Storage Tank or Tank Battery (E&P Sites Only)		
API Number	Name of Well	Newly Reported Well
05 - 039 - 06680	Calloway 3-33	<input checked="" type="checkbox"/>
- -		<input type="checkbox"/>
- -		<input type="checkbox"/>
- -		<input type="checkbox"/>
- -		<input type="checkbox"/>

Section 02 – Requested Action (Check applicable request boxes)

- ☐ Request for NEW INDIVIDUAL permit
☐ Request for coverage under GENERAL PERMIT
☐ GP05 ☒ GP08
☐ Request MODIFICATION to existing INDIVIDUAL permit (check boxes below)
☐ Change process or equipment ☐ Change company name
☐ Change permit limit ☐ Transfer of ownership ☐ Other
☐ APEN Submittal for Permit Exempt/Grandfathered source
☐ APEN Submittal for update only (Please note blank APEN's will not be accepted)

Addl. Info.

& Notes: _____

For new or reconstructed sources, the projected startup date is: **05** / **13** / **2016**
Normal Hours of Source Operation: **24** hours/day **7** days/week **52** weeks/year
Are Flash Emissions anticipated at these tanks ☒ Yes ☐ No
☐ Yes ☒ No
☐ Yes ☒ No
☐ Yes ☒ No

Colorado Department of Public Health and Environment

Air Pollution Control Division (APCD) This notice is valid for five (5) years. Submit a revised APEN prior to expiration of five-year term, or when a significant change is made (increase production, new equipment, change in fuel type, etc).

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Application status: <http://www.colorado.gov/cdphe/permitstatus>

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Permit Number: _____

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Operator Stack ID No.	Stack Base Elevation (feet)	Stack Discharge Height Above Ground Level (feet)	Temp. (°F)	Flow Rate (ACFM)	Velocity (ft/sec)	Moisture (%)

Direction of stack outlet (check one): ☐ Vertical ☐ Vertical with obstructing raincap

Exhaust Opening Shape & Size (check one): ☐ Circular: Inner Diameter (inches) = _____

Section 06 – Stack (Source, if no combustion) Location (Datum & either Lat/Long or UTM)

Horizontal Datum (NAD27, NAD83, WGS84)	UTM Zone (12 or 13)	UTM Easting or Longitude (meters or degrees)	UTM Northing or Latitude (meters or degrees)	Method of Collection for Location Data (e.g. map, GPS, GoogleEarth)
NAD83		-103.87433	38.94497	COGCC

☐ Horizontal ☐ Down ☐ Other (Describe): _____

☐ Other: Length (inches) = _____ Width (inches) = _____

Section 07 – Control Device Information

<input type="checkbox"/> Vapor Recovery Unit (VRU) used for control of the Storage Tank(s) Size: _____ Make/Model: _____ Requested VOC & HAP Control Efficiency: _____ % Annual time that VRU is bypassed (emissions vented): _____ %	<input type="checkbox"/> Combustion Device used for control of the Storage Tank(s) Rating: _____ MMBtu/hr Type: _____ Make/Model: _____ VOC & HAP Control Efficiency: Requested: _____ % Manufacturer Guaranteed: _____ % Minimum temp. to achieve requested control: _____ °F Waste gas heat content: _____ Btu/scf Constant pilot light? <input type="checkbox"/> Yes <input type="checkbox"/> No Pilot burner rating: _____ MMBtu/hr
<input type="checkbox"/> Closed loop system used for control of the storage tank(s) Description: _____	<input type="checkbox"/> Describe Any Other: _____

Section 08 – 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)? _____ psig

Please describe the separation process between the well and the storage tanks: Treatment in 3-phase horizontal separator

Section 09 – Emissions Inventory Information & Emission Control Information

☐ Emission Factor Documentation attached Data year for actual calendar yr. emissions below & throughput in Sec. 04 (e.g. 2007): 2016

Pollutant	Emission Factor		Actual Calendar Year Emission ²		Requested Permitted Emissions		Estimation Method or Emission Factor Source
	Uncontrolled Basis	Units	Uncontrolled (Tons/Year)	Controlled (Tons/Year)	Uncontrolled (Tons/Year)	Controlled (Tons/Year)	
NO _x	N/A	N/A	N/A	N/A	N/A	N/A	N/A
VOC	2.62E-01	lbs/bbl	1.42	0.07	1.71	0.09	State EF
CO	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzene	7.00E-03	lbs/bbl	0.04	0.00	0.05	0.00	State EF
Toluene	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ethylbenzene	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Xylenes	N/A	N/A	N/A	N/A	N/A	N/A	N/A
n-Hexane	2.20E-02	lbs/bbl	0.12	0.01	0.14	0.01	State EF
2,2,4-Trimethylpentane	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Please use the APCD Non-Criteria Reportable Air Pollutant Addendum form to report pollutants not listed above.

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 GP05 or GP08, I further certify that this source is and will be operated in full compliance with each condition of the applicable general permit.

Signature of Person Legally Authorized to Supply Data	Date	Jim Halvatzis Name of Legally Authorized Person (Please print)	Senior Landman Title
---	------	---	-------------------------

¹ You may be charged an additional APEN fee for APEN re-submittal due to incorrectly filled-out APEN or missing information.

² Annual emissions fees will be based on actual emissions reported here.

Additional Information Required:	<input type="checkbox"/>	Attach produced water laboratory analysis, stack test results and associated emissions calculations if you are requesting a site specific emissions factor according to the guidance in PS Memo 14-03	<input checked="" type="checkbox"/>	Check box to request copy of draft permit prior to issuance.
			<input type="checkbox"/>	Check box to request copy of draft permit prior to public notice.

AIR POLLUTANT EMISSION NOTICE (APEN) & Application for Construction Permit – Natural Gas Venting¹

Permit Number: _____

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

Emission Source AIRS ID: _____ / _____ / _____

Facility Equipment ID: VENT-1 [Provide Facility Equipment ID to identify how this equipment is referenced within your organization.]

Section 01 – Administrative Information

Company Name: Mustang Creek Operating LLC NAICS, or
Source Name: Calloway 3-33 SIC Code: 211111
Source Location: NWSE Sec. 3 T13S R58W County: Elbert
Elevation: 5,733 Feet
Mailing Address: 5251 DTC Parkway, Suite 800
Greenwood Village, CO ZIP Code: 80111

Person To Contact: Jim Halvatzis Phone Number: (303) 923-2447
E-mail Address: jhalvatzis@nexgenoilandgas.com Fax Number: _____

Section 03 – General Information

For existing sources, operation began on: _____ / _____ / _____

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

General description of equipment and purpose: permanent flare used for controlling vented natural gas from separator

Will this equipment be operated in any NAAQS nonattainment area?

(<http://www.colorado.gov/cdphe/attainment>)

☐ Yes ☒ No ☐ Don't know

For new or reconstructed sources, the projected startup date is: 05 / 13 / 2016

Section 04 – Processing Equipment Information

Description of Source²:

☐ Well Head Casing

☒ Gas/Liquid Separator

☐ Pneumatic Pump: Make: _____ Model: _____ Serial #: _____ Capacity: _____ gal./min.

☐ Compressor Rod Packing Make: _____ Model: _____ # of pistons: _____ Leak rate: _____ Scf/hr/pist.

☐ Blowdowns: # of events: _____ Volume: _____ MMscf/event

Description: _____

☐ Other: _____

	Maximum Vent Rate (scf/hr)	Actual Volume (MMscf/yr)	Requested Volume ³ (MMscf/yr)	Vent Gas Heating Value (Btu/scf)			
Process Parameters:	926.47	6.76	8.12	1,256			
	Molecular Wt.	VOC (mole %)	Benzene (mole %)	Toulene (mole %)	Ethylbenzene (mole %)	Xylene (mole %)	n-Hexane (mole %)
Vented Gas Properties:	26.94	38.83	0.04	0.01	0.00	0.00	0.11

☐ Submit a representative gas analysis (including BTEX & n-Hexane) to support calculations

¹ You will be charged an additional APEN fee if APEN is filled out incorrectly or missing information and requires re-submittal.

² Only one source type may be reported per APEN.

³ Requested values will become permit limitations. Requested level shall be a "not to exceed value".

Section 02 – Requested Action (check applicable request boxes)

- ☒ Request for NEW permit or newly reported emission source
- ☐ Request MODIFICATION to existing permit (check each box below that applies)
- ☐ Change fuel or equipment ☐ Change company name
- ☐ Change permit limit ☐ Transfer of ownership ☐ Other
- ☐ Request to limit HAPs with a Federally enforceable limit on PTE
- ☐ Request APEN update only (check the box below that applies)
- ☐ Revision to actual calendar year emissions for emission inventory
- ☐ Update 5-Year APEN term without change to permit limits or previously reported emissions

Additional
Info. &
Notes: _____

Colorado Department of Public Health and Environment Air Pollution Control Division (APCD)

This notice is valid for five (5) years. Submit a revised APEN prior to expiration of five-year term, or when a significant change is made (increase production, new equipment, change in fuel type, etc).

Mail this form along with a check for \$152.90 to:
Colorado Department of Public Health & Environment
APCD-SS-B1
4300 Cherry Creek Drive South
Denver, CO 80246-1530

For guidance on how to complete this APEN form:

Air Pollution Control Division: (303) 692-3150
Small Business Assistance Program (SBAP): (303) 692-3148 or
(303) 692-3175

APEN forms: <http://www.colorado.gov/cdphe/oilgaspermits>

Application status: <http://www.colorado.gov/cdphe/permitstatus>

- ☒ Check box to request copy of draft permit prior to issuance.
- ☐ Check box to request copy of draft permit prior to public notice.

AIR POLLUTANT EMISSION NOTICE (APEN) & Application for Construction Permit – Natural Gas Venting¹

Permit Number: _____

Emission Source AIRS ID: _____ / _____ / _____

Section 05 – Stack Information (Combustion stacks must be listed here)

Operator Stack ID No.	Stack Base Elevation (feet)	Stack Discharge Height Above Ground Level (feet)	Temp. (°F)	Flow Rate (ACFM)	Velocity (ft/sec)	Moisture (%)
Flare	5810					

Direction of stack outlet (**check one**): ☐ Vertical ☐ Vertical with obstructing raincap ☐ Horizontal ☐ Down ☐ Other (Describe): _____

Exhaust Opening Shape & Size (**check one**): ☐ Circular: Inner Diameter (inches) = _____ ☐ Other: Length (inches) = _____ Width (inches) = _____

Section 07 – Control Device Information

<input type="checkbox"/> VRU used for control of: _____ Size: _____ Make/Model: _____ Requested VOC & HAP Control Efficiency: _____ % Annual time that VRU is bypassed (emissions vented): _____ % The VRU recycles venting emissions to: _____	<input type="checkbox"/> Combustion Device used for control of: VOC and HAP Rating: _____ MMBtu/hr Type: Enclosed Flare Make/Model/Serial #: _____ VOC & HAP Control Efficiency: Requested: 95 % Manufacturer Guaranteed: 98 % Minimum temp. to achieve requested control: _____ °F Waste gas heat content: 1,256 Btu/scf Constant pilot light? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Pilot burner rating: _____ MMBtu/hr
<input type="checkbox"/> Describe Any Other: _____	

Section 08 – Emissions Inventory Information & Emission Control Information

Attach any emission calculations and emission factor documentation to this APEN form.

☒ Emission Factor Documentation attached

Data year for actual calendar yr. emissions below & throughput above (e.g. 2007):

2016

Pollutant	Control Device Description		Overall Collection Efficiency	Control Efficiency (% Reduction)	Emission Factor		Actual Calendar Year Emissions ⁴		Requested Permitted Emissions		Estimation Method or Emission Factor Source
	Primary	Secondary			Uncontrolled Basis	Units	Uncontrolled (Tons/Year)	Controlled (Tons/Year)	Uncontrolled (Tons/Year)	Controlled (Tons/Year)	
VOC	Flare	N/A	100	95	27,597.19	lb/MMscf	93.32	4.67	111.99	5.60	See Calcs
NO _x	N/A	N/A	N/A	N/A	0.068	lb/MMBtu	0.27	0.27	0.33	0.33	AP-42
CO	N/A	N/A	N/A	N/A	0.31	lb/MMBtu	1.25	1.25	1.50	1.50	AP-42
SO _x	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzene	Flare	N/A	100	95	77.71	lb/MMscf	0.26	0.01	0.32	0.02	See Calcs
Toulene	Flare	N/A	100	95	24.07	lb/MMscf	0.08	0.00	0.10	0.00	See Calcs
Ethylbenzene	Flare	N/A	100	95	1.40	lb/MMscf	0.00	0.00	0.01	0.00	See Calcs
Xylene	Flare	N/A	100	95	13.73	lb/MMscf	0.05	0.00	0.06	0.00	See Calcs
n-Hexane	Flare	N/A	100	95	242.17	lb/MMscf	0.82	0.01	0.98	0.05	See Calcs

Please use the APCD Non-Criteria Reportable Air Pollutant Addendum form to report pollutants not listed above.

¹ You will be charged an additional APEN fee if APEN is filled out incorrectly or missing information and requires re-submittal.⁴ Annual emission fees will be based on actual emissions reported here.**Section 09 –Applicant Certification** - I hereby certify that all information contained herein and information submitted with this application is complete, true and correct.

Signature of Person Legally Authorized to Supply Data

Date

Jim Halvatzis

Name of Legally Authorized Person (Please print)

Senior Landman

Title

Operating and Maintenance Plan for Produced Gas Flare Controlling Produced Gas From The Heater-Treater

This is an independent case-specific O&M Plan developed and submitted for approval with the permit application for the produced gas flare. The basis of this plan was the condensate tank battery template.

Submittal Date: 9/16/2016

Section 1 - Source Identification

For new permits some of this information (i.e. Facility AIRS ID, Facility Equipment ID, Permit Number, and AIRS Point ID) may not be known at the time of application. Please only fill out those fields that are known and leave the others blank.

Company Name: Mustang Creek Operating LLC Facility Location: NWSE Sec. 3 T13S R58W
Facility Name: Callaway 3-33 Facility AIRS ID (for existing facilities) TBD

Section 2 - Maintenance Schedules

Check one of the following:



Facility shall follow manufacturer recommendations for the operation and maintenance of equipment and control devices. These schedules and practices, as well as any maintenance records showing compliance with these recommendations, shall be made available to the Division upon request.



Facility shall follow individually developed maintenance practices and schedules for the operation and maintenance of equipment and control devices. These schedules and practices, as well as any maintenance records showing compliance with these recommendations, shall be made available to the division upon request and should be consistent with good air pollution control practices for minimizing emissions as defined in the New Source Performance Standard (NSPS) general conditions.

Section 3 - Monthly Emission Modeling or Calculations

The following box must be checked for O&M plan to be considered complete.

- ☒ The source will calculate emissions based on the methods and emission factors provided in the permit application and approved by the division, as reflected in the construction permit. Please see the operation and maintenance plan guidance document for further details and examples of emission calculations.

Section 4 - Emission Control or Recycling Equipment Monitoring Requirements

Table 1 below details the monitoring frequency for control equipment depending on the type of control equipment used and the requested permitted emissions at the facility. Check the appropriate box for “Monitoring Frequency” based on the facility-wide permitted VOC emissions. In addition, indicate controls by checking the appropriate boxes.

Table 1					
Emissions Control or Recycling Method		Parameter	Monitoring Frequency		
			<input type="checkbox"/>	Permitted Facility Emissions ≥ 80 tpy VOC	<input checked="" type="checkbox"/> Permitted Facility Emissions < 80 tpy VOC
Thermal Oxidizer	<input type="checkbox"/>	Combustion Chamber Temperature ^b		Daily	Weekly
Combustor or Flare	<input checked="" type="checkbox"/>	Pilot Light Monitoring ^c		Daily	Weekly
		Method 22 Readings		Daily	Weekly
Recycled or Closed Loop System (Including Vapor Recovery Units)	<input type="checkbox"/>	To be determined by the source and approved by the division ^d			
Re-routed to Reboiler Burner	<input type="checkbox"/>	To be determined by the source and approved by the division ^e			

^b Minimum Thermal Oxidizer Combustion Chamber Temperature

If the facility uses a thermal oxidizer to control emissions then the minimum combustion chamber temperature shall be: *Select one of the following options from Table 2:*

Table 2		
<input type="checkbox"/>	1400 ° F	
<input type="checkbox"/>	° F	Based on manufacturer specifications. Specifications must be submitted with the permit application and made available to the Division upon request
<input type="checkbox"/>	Based on testing performed. The test data shall be submitted and attached to the O&M Plan	

^c Pilot Light Monitoring Options

If the facility uses a Combustor or Flare then the source must indicate the method by which the presence of a pilot light will be monitored in Table 3. One primary method for Pilot Light Monitoring must be checked and, optionally, up to two backup methods may be checked.

Table 3		
Primary	Back-up	Monitoring Method
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Visual Inspection
<input type="checkbox"/>	<input type="checkbox"/>	Optical Sensor
<input type="checkbox"/>	<input type="checkbox"/>	Auto-Igniter Signal
<input type="checkbox"/>	<input type="checkbox"/>	Thermocouple

^d Recycled or Closed Loop System Monitoring Plan

In the space provided below please provide a brief description of the emission control or recycling system, including an explanation of how the system design ensures that emissions are being routed to the appropriate system at all times, or during all permitted runtime.

^e Reboiler Burner Control Monitoring Plan

In the space provided below please provide a brief description of the emission control system, including an explanation of how the system design ensures that emissions are being held or rerouted when the reboiler is not firing.

Section 5 – Recordkeeping Requirements

The following box must be checked for O&M plan to be considered complete.

- ☒ Synthetic minor sources are required to maintain maintenance and monitoring records for the requirements listed in sections 2, 3, 4 and 5 for a period of 5 years. If an applicable Federal NSPS, NESHAP or MACT requires a longer record retention period the operator must comply with the longest record retention requirement.

Section 6 - Additional Notes and O&M Activities

Please use this section to describe any additional notes or operation and maintenance activities.

Note: These templates are intended to address operation and maintenance requirements of the State of Colorado for equipment operated at synthetic minor facilities. If the facility or equipment is subject to other state or federal regulations with duplicative requirements, the source shall follow the most stringent regulatory requirement.

AIR POLLUTANT EMISSION NOTICE (APEN) & Application for Construction Permit – Reciprocating Internal Combustion Engine¹

¹ You will be charged an additional APEN fee if APEN is filled out incorrectly or missing information and requires re-submittal.

Permit Number: _____

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

Emission Source AIRS ID: _____ / _____ / _____

Facility Equipment ID: ENG-1

[Provide Facility Equipment ID to identify how this equipment is referenced within your organization.]

Section 01 – Administrative Information

Company Name: Mustang Creek Operating LLC NAICS, or
Source Name: Callaway 3-33 SIC Code: 211111
Source Location: NWSE S3 T13S R58W County: Elbert
Elevation: 5,733 Feet
Portable Source
Home Base: _____
Mailing Address: 5251 DTC Parkway, Suite 800 ZIP Code: 80111
Greenwood Village, CO
Person To
Contact: Jim Halvatzis Phone Number: (303) 923-2447
E-mail Address: jhalvatzis@nexgenoilandgas.com Fax Number: _____

Section 03 – General Information

For existing sources, operation began on: _____ / _____ / _____
Normal hours of source operation: 24 hours/day 7 days/week 52 weeks/year
General description of equipment purpose: Engine for Pump Jack

Date the engine was ordered: _____ Date engine construction commenced: 2014
Date the engine was relocated into Colorado: _____ Date of any reconstruction/modification: 2016
Will this equipment be operated in any NAAQS nonattainment area? ☐ Yes ☒ No ☐ Don't know
(<http://www.colorado.gov/cdphe/attainment>)

Section 04 – Engine Information

Engine date of manufacture: 2014 Engine displacement: 0.98 L/cyl
Manufacturer: Cummins Model: G 5.9 Serial No.: TBD

Engine function: ☐ Primary and/or peaking power ☐ Emergency back-up power
☐ Compression ☒ Pump jack ☐ Water pump ☐ Other: _____

Manufacturer's maximum rated horsepower @ sea level: 49 BHP @ 1,200 RPM
Manufacturer's maximum site rating: 49 BHP @ 1,200 RPM _____ kW
Engine Brake Specific Fuel Consumption @ 100% Load: 8,462 Btu/HP-hr

Cycle Type: ☐ 2-Stroke ☒ 4-Stroke Combustion: ☐ Lean Burn ☒ Rich Burn
Ignition Source: ☐ Spark ☒ Compression Aspiration: ☐ Natural ☐ Turbocharged

What is the maximum number of hours this engine is used for emergency back-up power? 0 Hours/year

Section 02 – Requested Action (check applicable request boxes)

- ☒ Request for NEW permit or newly reported emission source
☐ Request for coverage under GENERAL PERMIT number GP02 (Natural Gas Only)
☐ Request MODIFICATION to existing permit (check each box below that applies)
☐ Change fuel or equipment ☐ Change company name
☐ Change permit limit ☐ Transfer of ownership ☐ Other
☐ Request PORTABLE source permit
☐ Request APEN Update

Emissions data must be completed. Blank APENs will not be accepted.

- ☐ Notification of AOS permanent replacement

**Addl.
Info. &**

Notes: APEN required and permit exempt engine, HP limited by governor

For new or reconstructed sources, the projected startup date is: 05 / 13 / 2016

Colorado Department of Public Health and Environment Air Pollution Control Division (APCD)

This notice is valid for five (5) years. Submit a revised APEN prior to expiration of five-year term, or when a significant change is made (increase production, new equipment, change in fuel type, etc).

Mail this form along with a check for \$152.90 per APEN and \$1,500 for each general permit registration to:
Colorado Department of Public Health & Environment
APCD-SS-B1
4300 Cherry Creek Drive South
Denver, CO 80246-1530

For guidance on how to complete this APEN form:

Air Pollution Control Division: (303) 692-3150
Small Business Assistance Program (SBAP): (303) 692-3148 or (303) 692-3175

APEN forms: <http://www.colorado.gov/cdphe/APENforms>

Application status: <http://www.colorado.gov/cdphe/permitstatus>

- ☒ Check box to request copy of draft permit prior to issuance.
☐ Check box to request copy of draft permit prior to public notice.

AIR POLLUTANT EMISSION NOTICE (APEN) & Application for Construction Permit – Reciprocating Internal Combustion Engine¹

Permit Number: _____

Emission Source AIRS ID: _____ / _____ / _____

Section 05 – Stack Information (Attach a separate sheet with relevant information in the event of multiple stacks; provide datum & **either** Lat/Long **or** UTM)

Operator Stack ID No.	Stack Base Elevation (feet)	Stack Discharge Height Above Ground Level (feet)	Temp. (°F)	Flow Rate (ACFM)	Velocity (ft/sec)	Moisture (%)	Horizontal Datum (NAD27, NAD83, WGS84)	UTM Zone (12 or 13)	UTM Easting or Longitude (meters or degrees)	UTM Northing or Latitude (meters or degrees)	Method of Collection for Location Data (e.g. map, GPS, GoogleEarth)
ENG-1	5,810	8.24	1078	430			NAD83		-103.87433	38.94497	COGCC

Direction of stack outlet (**check one**): ☒ Vertical ☐ Vertical with obstructing raincap ☐ Horizontal ☐ Down ☐ Other (Describe): _____
 Exhaust Opening Shape & Size (**check one**): ☒ Circular: Inner Diameter (inches) = 4.00 ☐ Other: Length (inches) = _____ Width (inches) = _____

Section 06 – Fuel Consumption Information

Fuel Type	Fuel Use Rate @ 100% load (SCF/hr, gal/hr)	Annual Fuel Consumption (gal/yr or MMSCF/yr)		Fuel Heating Value (Btu/lb, Btu/gal, Btu/SCF)	Sulfur Content (% wt.)	Seasonal Fuel Use (% of Annual Use)			
		Actual Reported for Calendar Year	Requested Permit Limit			Dec-Feb	Mar-May	Jun-Aug	Sep-Nov
Natural Gas	330.2	2.90 MMSCF/yr		1,256	0	25	25	25	25

Is this engine equipped with an Air/Fuel ratio controller? ☒ Yes ☐ No

Section 07 – Emissions Inventory Information & Emission Control Information

☒ Emission Factor Documentation attached Data year for actual calendar yr. emissions below & fuel use above (e.g. 2007): 2016

Pollutant	Control Device Description		Control Efficiency (% Reduction)	Emission Factor		Actual Calendar Year Emissions ²		Requested Permitted Emissions		Estimation Method or Emission Factor Source
	Primary	Secondary		Uncontrolled Basis	Units	Uncontrolled (Tons/Year)	Controlled (Tons/Year)	Uncontrolled (Tons/Year)	Controlled (Tons/Year)	
TSP	N/A	N/A	N/A	0.01941	lb/MMBtu	3.53E-02	3.53E-02			AP-42
PM ₁₀	N/A	N/A	N/A	0.00950	lb/MMBtu	1.73E-02	1.73E-02			AP-42
PM _{2.5}	N/A	N/A	N/A	0.00950	lb/MMBtu	1.73E-02	1.73E-02			AP-42
SO _x	N/A	N/A	N/A	0.000588	lb/MMBtu	1.07E-03	1.07E-03			AP-42
NO _x	Catalyst	N/A	94	13.04	g/hp-hr	23.68	1.32			Manufacturer Specs
VOC	N/A	N/A	N/A	2.80	g/hp-hr	1.32	1.32			Manufacturer Specs
CO	Catalyst	N/A	66	14.38	g/hp-hr	6.80	2.27			Manufacturer Specs
Formaldehyde	N/A	N/A	N/A	0.020500	lb/MMBtu	0.04	0.04			AP-42
Acetaldehyde	N/A	N/A	N/A	0.002790	lb/MMBtu	5.07E-03	5.07E-03			AP-42
Acrolein	N/A	N/A	N/A	0.002630	lb/MMBtu	4.78E-03	4.78E-03			AP-42
Benzene	N/A	N/A	N/A	0.001580	lb/MMBtu	2.87E-03	2.87E-03			AP-42

Please use the APCD Non-Criteria Reportable Air Pollutant Addendum form to report pollutants not listed above.

¹ You will be charged an additional APEN fee if APEN is filled out incorrectly or missing information and requires re-submittal.

² Annual emission fees will be based on actual emissions reported here. If left blank, annual emission fees will be based on requested emissions.

Section 08 – 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 GP02, I further certify that this source is and will be operated in full compliance with each condition of general permit GP02.

Signature of Person Legally Authorized to Supply Data	Date	Jim Halvatzis Name of Legally Authorized Person (Please print)	Senior Landman Title
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ATTACHMENT A
FLOW DIAGRAM

MUSTANG CREEK OPERATING, LLC

CALLAWAY 3-33
NWSE SEC. 3 T13S R58W
ELBERT COUNTY, COLORADO

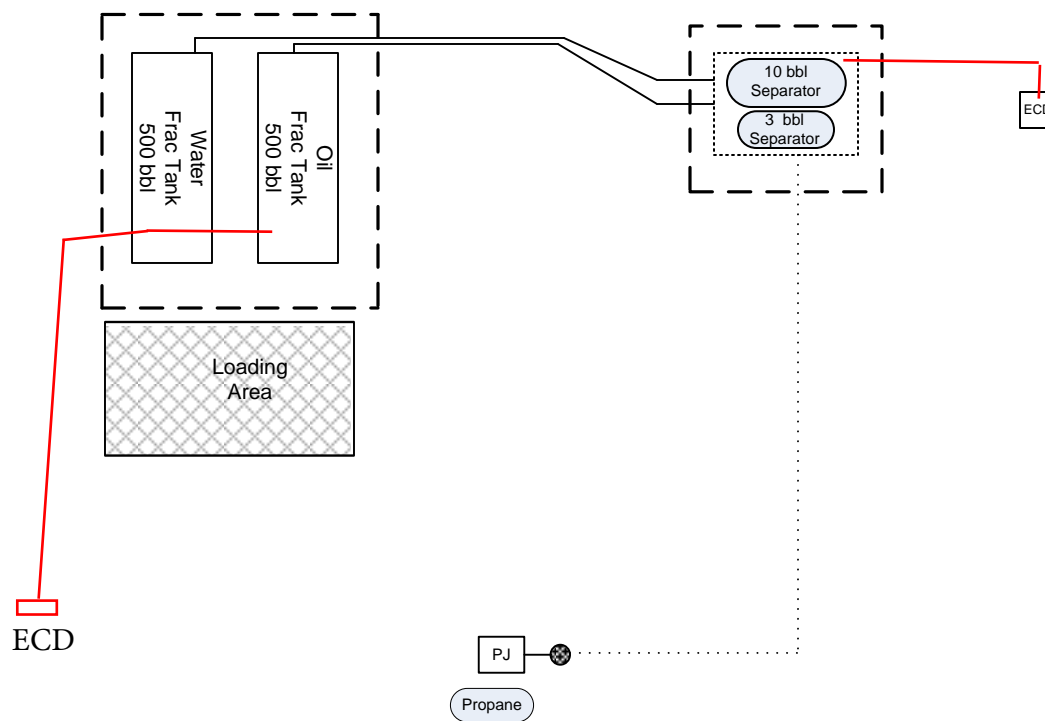


NOT TO SCALE

Unnamed Pond
160 feet

LEGEND

	FENCE
	BERM
	ABOVEGROUND PIPING
	UNDERGROUND PIPING (LOCATION APPROXIMATE)
	DIRECTION OF FLOW
gal	GALLON(S)
bbbl	BARREL(S)
	WELLHEAD
	PUMP JACK
ECD	EMISSION CONTROL DEVICE
LL	LOAD LINE



NOTE: ALL UNDERGROUND PIPING IS FOR
PROCESS FLOW DEMONSTRATION ONLY



ATTACHMENT B
PROCESS DESCRIPTION

Mustang Creek Operating LLC
Process Description
Callaway 3-33
SWSE Sec. 3 T13S R58W

The facility is an oil production facility, which produces condensate, produced water, and trace amounts of natural gas. The production stream flows from one wellhead (Payne 23-41) to a three-phase separator. The wellhead is pumped using a pumping unit powered by a natural gas engine. This engine is limited to 49hp by a governor.

From the three-phase separator, the condensate phase is directed to one 500-barrel (bbl) condensate storage tank. The water phase is piped to the one 500-bbl produced water storage tank. Hydrocarbon vapors from the condensate and water tanks are routed to a combustor. As needed, the condensate and produced water is transferred from the storage tanks to separate tanker trucks for transportation from the site. Any natural gas that is produced is used to power the natural gas engine; any excess gas is burned in an enclosed flare. Fugitive emissions are expected from the various equipment components on site.



ATTACHMENT C
FACILITY EQUIPMENT EMISSION CALCULATIONS

Company:

Mustang Creek Operating LLC

Site:

Callaway 3-33

TABLE 1: Uncontrolled PTE Emission Summary Sheet

Equipment	NO _x		CO		VOC		Total HAPs		PM-10		SO ₂	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Condensate Storage Tanks	n/a	n/a	n/a	n/a	2.75	12.04	0.06	0.25	n/a	n/a	n/a	n/a
Produced Water Storage Tanks	n/a	n/a	n/a	n/a	0.39	1.71	0.04	0.19	n/a	n/a	n/a	n/a
Truck Loadout	n/a	n/a	n/a	n/a	0.28	1.23	0.00	0.02	n/a	n/a	n/a	n/a
Cummins G 5.9 Engine (ENG-1)	5.41	23.68	1.55	6.80	0.30	1.32	0.01	0.06	0.00	0.02	0.00	0.00
Elevated Flare	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
(1) Heaters	0.05	0.22	0.04	0.18	0.01	0.01	0.00	0.00	0.00	0.02	0.00	0.00
Produced Gas Venting	n/a	n/a	n/a	n/a	25.57	111.99	0.36	1.59	n/a	n/a	n/a	n/a
Fugitive Emissions	n/a	n/a	n/a	n/a	0.01	0.02	0.00	0.00	n/a	n/a	n/a	n/a
Total PTE	5.46	23.90	1.59	6.98	29.30	128.33	0.48	2.12	0.01	0.03	0.00	0.00

TABLE 2: Controlled PTE Emission Summary Sheet

Equipment	NO _x		CO		VOC		Total HAPs		PM-10		SO ₂	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Condensate Storage Tanks	n/a	n/a	n/a	n/a	0.14	0.60	0.00	0.01	n/a	n/a	n/a	n/a
Produced Water Storage Tanks	n/a	n/a	n/a	n/a	0.02	0.09	0.00	0.01	n/a	n/a	n/a	n/a
Truck Loadout	n/a	n/a	n/a	n/a	0.28	1.23	0.00	0.02	n/a	n/a	n/a	n/a
Cummins G 5.9 Engine (ENG-1)	0.30	1.32	0.52	2.27	0.30	1.32	0.01	0.06	0.00	0.02	0.00	0.00
Elevated Flare	0.08	0.35	0.36	1.58	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
(1) Heaters	0.05	0.22	0.04	0.18	0.01	0.01	0.00	0.00	0.00	0.02	0.00	0.00
Produced Gas Venting	n/a	n/a	n/a	n/a	1.28	5.60	0.02	0.08	n/a	n/a	n/a	n/a
Fugitive Emissions	n/a	n/a	n/a	n/a	0.01	0.02	0.00	0.00	n/a	n/a	n/a	n/a
Total PTE	0.44	1.91	0.94	4.13	2.03	8.88	0.04	0.18	0.01	0.03	0.00	0.00



TABLE 3: Uncontrolled Actual Emission Summary Sheet

Equipment	NO _x		CO		VOC		Total HAPs		PM-10		SO ₂	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Condensate Storage Tanks	n/a	n/a	n/a	n/a	2.29	10.02	0.05	0.21	n/a	n/a	n/a	n/a
Produced Water Storage Tanks	n/a	n/a	n/a	n/a	0.32	1.42	0.04	0.16	n/a	n/a	n/a	n/a
Truck Loadout	n/a	n/a	n/a	n/a	0.23	1.03	0.00	0.02	n/a	n/a	n/a	n/a
Cummins G 5.9 Engine (ENG-1)	5.41	23.68	1.55	6.80	0.30	1.32	0.01	0.06	0.00	0.02	0.00	0.00
Elevated Flare	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
(1) Heaters	0.05	0.22	0.04	0.18	0.01	0.01	0.00	0.00	0.00	0.02	0.00	0.00
Produced Gas Venting	n/a	n/a	n/a	n/a	21.31	93.32	0.30	1.33	n/a	n/a	n/a	n/a
Fugitive Emissions	n/a	n/a	n/a	n/a	0.01	0.02	0.00	0.00	n/a	n/a	n/a	n/a
Total PTE	5.46	23.90	1.59	6.98	24.47	107.15	0.40	1.77	0.01	0.03	0.00	0.00

TABLE 4: Controlled Actual Emission Summary Sheet

Equipment	NO _x		CO		VOC		Total HAPs		PM-10		SO ₂	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Condensate Storage Tanks	n/a	n/a	n/a	n/a	0.11	0.50	0.00	0.01	n/a	n/a	n/a	n/a
Produced Water Storage Tanks	n/a	n/a	n/a	n/a	0.02	0.07	0.00	0.01	n/a	n/a	n/a	n/a
Truck Loadout	n/a	n/a	n/a	n/a	0.23	1.03	0.00	0.02	n/a	n/a	n/a	n/a
Cummins G 5.9 Engine (ENG-1)	0.30	1.32	0.52	2.27	0.30	1.32	0.01	0.06	0.00	0.02	0.00	0.00
Elevated Flare	0.05	0.29	0.25	1.32	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
(1) Heaters	0.05	0.22	0.04	0.18	0.01	0.01	0.00	0.00	0.00	0.02	0.00	0.00
Produced Gas Venting	n/a	n/a	n/a	n/a	1.07	4.67	0.02	0.07	n/a	n/a	n/a	n/a
Fugitive Emissions	n/a	n/a	n/a	n/a	0.01	0.02	0.00	0.00	n/a	n/a	n/a	n/a
Total PTE	0.41	1.85	0.83	3.85	1.74	7.62	0.04	0.16	0.01	0.03	0.00	0.00

Company:

Site:

Mustang Creek Operating LLC
Callaway 3-33

TABLE 5: Uncontrolled PTE Emission Summary Sheet

Equipment	Benzene		Toluene		Ethylbenzene		Xylene		n-Hexane		Formaldehyde		Acetaldehyde		Acrolein		Methanol		2,2,4 TMP	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Condensate Storage Tanks	0.0108	0.0472	0.0046	0.0202	0.0005	0.0021	0.0011	0.0050	0.0399	0.1746	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0011	0.0047
Produced Water Storage Tanks	0.0104	0.0456	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0327	0.1434	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0000	0.0000
Truck Loadout	0.0005	0.0022	n/a	n/a	n/a	n/a	n/a	n/a	0.0043	0.0189	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Cummins G 5.9 Engine (ENG-1)	0.0007	0.0029	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0085	0.0372	0.0012	0.0051	0.0011	0.0048	0.0013	0.0056	n/a	n/a
Elevated Flare	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
(1) Heaters	0.0000	0.0000	0.0000	0.0000	n/a	n/a	n/a	n/a	0.0009	0.0039	0.0000	0.0002	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Produced Gas Venting	0.0720	0.3153	0.0223	0.0977	0.0013	0.0057	0.0127	0.0557	0.2244	0.9827	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0307	0.1345
Fugitive Emissions	0.0000	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0001	0.0001	0.0002	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0000	0.0000
Total PTE	0.0944	0.4133	0.0269	0.1179	0.0018	0.0078	0.0139	0.0608	0.3022	1.3238	0.0085	0.0374	0.0012	0.0051	0.0011	0.0048	0.0013	0.0056	0.0318	0.1393

TABLE 6: Controlled PTE Emission Summary Sheet

Equipment	Benzene		Toluene		Ethylbenzene		Xylene		n-Hexane		Formaldehyde		Acetaldehyde		Acrolein		Methanol		2,2,4 TMP	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Condensate Storage Tanks	0.0005	0.0024	0.0002	0.0010	0.0000	0.0001	0.0001	0.0002	0.0020	0.0087	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0001	0.0002
Produced Water Storage Tanks	0.0005	0.0023	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0016	0.0072	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0000	0.0000
Truck Loadout	0.0005	0.0022	n/a	n/a	n/a	n/a	n/a	n/a	0.0043	0.0189	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Cummins G 5.9 Engine (ENG-1)	0.0007	0.0029	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0085	0.0372	0.0012	0.0051	0.0011	0.0048	0.0013	0.0056	n/a	n/a
Elevated Flare	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
(1) Heaters	0.0000	0.0000	0.0000	0.0000	n/a	n/a	n/a	n/a	0.0009	0.0039	0.0000	0.0002	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Produced Gas Venting	0.0036	0.0158	0.0011	0.0049	0.0001	0.0003	0.0006	0.0028	0.0112	0.0491	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0015	0.0067
Fugitive Emissions	0.0000	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0001	0.0001	0.0002	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0000	0.0000
Total PTE	0.0058	0.0255	0.0014	0.0060	0.0001	0.0004	0.0007	0.0031	0.0201	0.0881	0.0085	0.0374	0.0012	0.0051	0.0011	0.0048	0.0013	0.0056	0.0016	0.0070

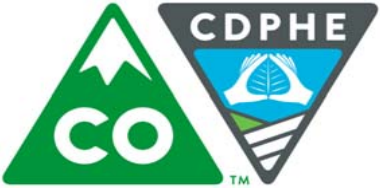
TABLE 7: Uncontrolled Actual Emission Summary Sheet

Equipment	Benzene		Toluene		Ethylbenzene		Xylene		n-Hexane		Formaldehyde		Acetaldehyde		Acrolein		Methanol		2,2,4 TMP	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Condensate Storage Tanks	0.0090	0.0393	0.0038	0.0168	0.0004	0.0018	0.0009	0.0042	0.0332	0.1453	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0009	0.0039
Produced Water Storage Tanks	0.0087	0.0380	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	#REF!	0.0273	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0000	0.0000
Truck Loadout	0.0004	0.0018	n/a	n/a	n/a	n/a	n/a	n/a	0.0036	0.0157	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Cummins G 5.9 Engine (ENG-1)	0.0007	0.0029	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0085	0.0372	0.0012	0.0051	0.0011	0.0048	0.0013	0.0056	n/a	n/a
Elevated Flare	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
(1) Heaters	0.0000	0.0000	0.0000	0.0000	n/a	n/a	n/a	n/a	0.0009	0.0039	0.0000	0.0002	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Produced Gas Venting	0.0600	0.2628	0.0186	0.0814	0.0011	0.0047	0.0106	0.0464	0.1870	0.8189	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0256	0.1121
Fugitive Emissions	0.0000	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0001	0.0001	0.0002	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0000	0.0000
Total Actuals	0.0787	0.3448	0.0224	0.0983	0.0015	0.0065	0.0116	0.0506	#REF!	1.0114	0.0085	0.0374	0.0012	0.0051	0.0011	0.0048	0.0013	0.0056	0.0265	0.1161

TABLE 8: Controlled Actual Emission Summary Sheet

Equipment	Benzene		Toluene		Ethylbenzene		Xylene		n-Hexane		Formaldehyde		Acetaldehyde		Acrolein		Methanol		2,2,4 TMP	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Condensate Storage Tanks	0.0004	0.0020	0.0002	0.0008	0.0000	0.0001	0.0000	0.0002	0.0017	0.0073	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0000	0.0002
Produced Water Storage Tanks	0.0004	0.0019	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	#REF!	0.0014	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0000	0.0000
Truck Loadout	0.0004	0.0018	n/a	n/a	n/a	n/a	n/a	n/a	0.0036	0.0157	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Cummins G 5.9 Engine (ENG-1)	0.0007	0.0029	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0085	0.0372	0.0012	0.0051	0.0011	0.0048	0.0013	0.0056	n/a	n/a
Elevated Flare	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
(1) Heaters	0.0000	0.0000	0.0000	0.0000	n/a	n/a	n/a	n/a	0.0009	0.0039	0.0000	0.0002	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Produced Gas Venting	0.0030	0.0131	0.0009	0.0041	0.0001	0.0002	0.0005	0.0023	0.0093	0.0409	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0013	0.0056
Fugitive Emissions	0.0000	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0001	0.0001	0.0002	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0000	0.0000
Total Actuals	0.0050	0.0218	0.0011	0.0050	0.0001	0.0004	0.0006	0.0026	#REF!	0.0695	0.0085	0.0374	0.0012	0.0051	0.0011	0.0048	0.0013	0.0056	0.0013	0.0058





Facility Wide Emissions Inventory Form

Ver. April, 2015

Company Name: Mustang Creek Operating LLC
Source Name: Callaway 3-33
Source AIRS ID: (Pending - New Source)

		Uncontrolled Potential to Emit (PTE)																	Controlled Potential to Emit (PTE)																		
		Criteria (TPY)							HAPs (lbs/yr)										Criteria (TPY)							HAPs (lbs/yr)											
AIRS ID	Equipment Description	TSP	PM10	PM2.5	SO2	NOx	VOC	CO	HCHO	Acetal	Acro	BZ	Tol	EB	Xyl	n-Hex	Meth	224-TMP	TSP	PM10	PM2.5	SO2	NOx	VOC	CO	HCHO	Acetal	Acro	BZ	Tol	EB	Xyl	n-Hex	Meth	224-TMP		
	Condensate Storage Tanks						12.04					94.38	40.32	4.26	9.99	349.26		9.46					0.60						4.72	2.02	0.21	0.50	17.46		0.47		
	Produced Water Storage Tanks						1.71					91.26	0.00	0.00	0.00	286.82		0.00					0.09						4.56	0.00	0.00	0.00	14.34		0.00		
	Cummins G 5.9 Engine (ENG-1)	0.04	0.02	0.02	0.00	23.68	1.32	6.80	74.46	10.13	9.55	5.74					11.11		0.04	0.02	0.02	0.00	1.32	1.32	2.27	74.46	10.13	9.55	5.74					11.11			
	Produced Gas Venting						111.99					630.67	195.36	11.37	111.40	1,965.41		269.07					5.60						31.53	9.77	0.57	5.57	98.27		13.45		
Permitted Sources Subtotal =		0.04	0.02	0.02	0.00	23.68	127.06	6.80	74.46	10.13	9.55	822.05	235.67	15.63	121.39	2,601.48	11.11	278.53	0.04	0.02	0.02	0.00	1.32	7.61	2.27	74.46	10.13	9.55	46.55	11.78	0.78	6.07	130.07	11.11	13.93		
APEN Only - Permit Exempt Sources																																					
APEN Only Subtotal =		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
APEN Exempt / Insignificant sources																																					
	Truck Loadout						1.23					4.35				37.76							1.23						4.35			37.76					
	(1) Heaters	0.02	0.02	0.02	0.00	0.22	0.01	0.18	0.33			0.01	0.01			7.85			0.02	0.02	0.02	0.00	0.22	0.01	0.18	0.33			0.01	0.01			7.85				
	Fugitive Emissions				0.02					0.16	0.16	0.05	0.14	0.48		0.05						0.02					0.16	0.16	0.05	0.14	0.48		0.05				
Insignificant Subtotal =		0.02	0.02	0.02	0.02	0.22	1.25	0.18	0.33	0.16	0.16	4.41	0.15	0.48	0.00	45.66	0.00	0.00	0.02	0.02	0.02	0.02	0.22	1.25	0.18	0.33	0.16	0.16	4.41	0.15	0.48	0.00	45.66	0.00	0.10		
Total, All Sources =		0.05	0.03	0.03	0.02	23.90	128.30	6.98	74.79	10.29	9.72	826.46	235.83	16.11	121.39	2,647.15	11.11	278.53	0.05	0.03	0.03	0.02	1.54	8.86	2.45	74.79	10.29	9.72	50.97	11.94	1.26	6.07	175.74	11.11	14.03		
Uncontrolled HAPs Summary (TPY) =																	Controlled HAPs Summary (TPY) =																				
0.04 0.01 0.00 0.41 0.12 0.01 0.06 1.32 0.01 0.14																	0.04 0.01 0.00 0.03 0.01 0.00 0.00 0.09 0.01 0.01																				
Uncontrolled Total, All HAPs (TPY) =																	Controlled Total, All HAPs (TPY) =																				
2.12																	0.18																				

Footnotes:

- This form should be completed to include both existing sources and all proposed new or modifications to existing emissions sources
- If the emissions source is new then enter "proposed" under the Permit No. and AIRS ID data columns
- HAP abbreviations include:

BZ = Benzene
Tol = Toluene
EB = Ethylbenzene
Xyl = Xylene
HCHO = Formaldehyde

224-TMP = 2,2,4-Trimethylpentane
Acetal = Acetaldehyde
Acro = Acrolein
n-Hex = n-Hexane
Meth = Methanol
- APEN Exempt/Insignificant Sources should be included when warranted.

Mustang Creek Operating LLC
Callaway 3-33
Condensate Tank(s) Detail Sheet

Tank Description (1) 500-bbl Condensate Tank
 Tank Capacity 500 bbl
 Tank Contents Condensate
 Emissions Controlled? Yes
 Control Efficiency 95%
 Tank Orientation Aboveground
 Emission Factor Type Site-Specific

VOC Emission Factor	2.298	lbs/bbl
Benzene Emission Factor	0.009	lbs/bbl
n-Hexane Emission Factor	0.0333	lbs/bbl
Toluene Emission Factor	0.0038	lbs/bbl
Ethylbenzene Emission Factor	0.0004	lbs/bbl
Xylene Emission Factor	0.0010	lbs/bbl
2,2,4 Trimethylpentane Emission Factor	0.0009	lbs/bbl

Actual Condensate Production Per Day 23.88 bpd
 Actual Annual Condensate Production 8,717.10 bbls/yr (Rounded up to closest tenth)
 PTE Annual Condensate Production 10,475.50 bbls/yr (Rounded up to closest tenth)
 PTE Condensate Production Per Day 28.70 bpd (Rounded up to closest tenth)

PTE Annual Emissions Summary (Flash/Working/Breathing). Assumes 20% increase in actual production.

	Uncontrolled PTE Emissions		Controlled PTE Emissions	
	24,075.33	lbs/year	1,203.77	lbs/year
VOC Emissions:	12.04	tons/year	0.60	tons/year
	2.75	lb/hr	0.14	lb/hr
	94.38	lbs/year	4.72	lbs/year
Benzene Emissions:	0.05	tons/year	0.00	tons/year
	0.01	lb/hr	0.00	lb/hr
	349.26	lbs/year	17.46	lbs/year
n-Hexane Emissions:	0.17	tons/year	0.01	tons/year
	0.04	lb/hr	0.00	lb/hr
	40.32	lbs/year	2.02	lbs/year
Toluene:	0.02	tons/year	0.00	tons/year
	0.00	lb/hr	0.00	lb/hr
	4.26	lbs/year	0.21	lbs/year
Ethylbenzene:	0.00	tons/year	0.00	tons/year
	0.00	lb/hr	0.00	lb/hr
	9.99	lbs/year	0.50	lbs/year
Xylene:	0.00	tons/year	0.00	tons/year
	0.00	lb/hr	0.00	lb/hr
	9.46	lbs/year	0.47	lbs/year
2,2,4 Trimethylpentane:	0.00	tons/year	0.00	tons/year
	0.00	lb/hr	0.00	lb/hr

Actual Annual Emissions Summary

	Uncontrolled Actual Emissions		Controlled Actual Emissions	
	20,034.09	lbs/year	1,001.70	lbs/year
VOC Emissions:	10.02	tons/year	0.50	tons/year
	2.29	lb/hr	0.11	lb/hr
	78.54	lbs/year	3.93	lbs/year
Benzene Emissions:	0.04	tons/year	0.00	tons/year
	0.01	lb/hr	0.00	lb/hr
	290.63	lbs/year	14.53	lbs/year
n-Hexane Emissions:	0.15	tons/year	0.01	tons/year
	0.03	lb/hr	0.00	lb/hr
	33.55	lbs/year	1.68	lbs/year
Toluene:	0.02	tons/year	0.00	tons/year
	0.00	lb/hr	0.00	lb/hr
	3.55	lbs/year	0.18	lbs/year
Ethylbenzene:	0.00	tons/year	0.00	tons/year
	0.00	lb/hr	0.00	lb/hr
	8.31	lbs/year	0.42	lbs/year
Xylene:	0.00	tons/year	0.00	tons/year
	0.00	lb/hr	0.00	lb/hr
	7.87	lbs/year	0.39	lbs/year
2,2,4 Trimethylpentane:	0.00	tons/year	0.00	tons/year
	0.00	lb/hr	0.00	lb/hr

Mustang Creek Operating LLC**Callaway 3-33****Produced Water Tank Details**

Tank Description (1) 500-bbl Produced Water Tank
 Tank Capacity 500 bbl
 Tank Contents Produced Water
 Emissions Controlled? Yes
 Control Efficiency 95%
 Tank Orientation Aboveground
 Emission Factor Type State

VOC Emissions Factor	2.62E-01	lbs/bbl
Benzene Emissions Factor	7.00E-03	lbs/bbl
n-Hexane Emissions Factor	2.20E-02	lbs/bbl

Actual Water Production Per Day 29.76 bwpd
 Actual Annual Water Production 10,864.20 bbls/yr (Rounded up to closest tenth)
 PTE Annual Water Production 13,037.10 bbls/yr (Rounded up to closest tenth)
 PTE Water Production Per Day 35.80 bwpd (Rounded up to closest tenth)

PTE Annual Emissions Summary (Flash/Working/Breathing). Assumes 20% increase in actual production.

	Uncontrolled PTE Emissions		Controlled PTE Emissions	
VOC Emissions:	3,415.72	lbs/year	170.79	lbs/year
	1.71	tons/year	0.09	tons/year
	0.39	lb/hr	0.02	lb/hr
Benzene Emissions:	91.26	lbs/year	4.56	lbs/year
	0.05	tons/year	0.00	tons/year
	0.01	lb/hr	0.00	lb/hr
n-Hexane Emissions:	286.82	lbs/year	14.34	lbs/year
	0.14	tons/year	0.01	tons/year
	0.03	lb/hr	0.00	lb/hr

Actual Annual Emissions Summary

	Uncontrolled Actual Emissions		Controlled Actual Emissions	
VOC Emissions:	2,846.42	lbs/year	142.32	lbs/year
	1.42	tons/year	0.07	tons/year
	0.32	lb/hr	0.02	lb/hr
Benzene Emissions:	76.05	lbs/year	3.80	lbs/year
	0.04	tons/year	0.00	tons/year
	0.01	lb/hr	0.00	lb/hr
n-Hexane Emissions:	239.01	lbs/year	11.95	lbs/year
	0.12	tons/year	0.01	tons/year
	0.03	lb/hr	0.00	lb/hr

Mustang Creek Operating LLC

Callaway 3-33

Condensate Loadout (State Emission Factors)

Source Description	Condensate Tank Loadout		
Method	Submerged Fill		
Tank Contents	Condensate		
Emissions Controlled?	No		
Control Efficiency	N/A		
VOC Emissions Factor	0.236	lbs/bbl	
Benzene Emissions Factor	4.16E-04	lbs/bbl	
n-Hexane Emissions Factor	3.61E-03	lbs/bbl	
Actual Condensate Loaded Per Day	23.88	bpd	
Actual Annual Condensate Loadout	8,717.10	barrels per year	(Rounded up to closest tenth)
PTE Annual Condensate Loadout	10,460.60	barrels per year	(Rounded up to closest tenth)
PTE Condensate Loaded Per Day	28.70	bpd	(Rounded up to closest tenth)

PTE Annual Emissions Summary. Assumes 20% increase in actual production.

	Uncontrolled PTE Emissions		Controlled PTE Emissions	
VOC Emissions:	2,468.70	lbs/year	2,468.70	lbs/year
	1.23	tons/year	1.23	tons/year
	0.28	lb/hr	0.28	lb/hr
Benzene Emissions:	4.35	lbs/year	4.35	lbs/year
	0.00	tons/year	0.00	tons/year
	0.00	lb/hr	0.00	lb/hr
n-Hexane Emissions:	37.76	lbs/year	37.76	lbs/year
	0.02	tons/year	0.02	tons/year
	0.00	lb/hr	0.00	lb/hr

Actual Annual Emissions Summary

	Uncontrolled Actual Emissions		Controlled Actual Emissions	
VOC Emissions:	2,057.24	lbs/year	2,057.24	lbs/year
	1.03	tons/year	1.03	tons/year
	0.23	lb/hr	0.23	lb/hr
Benzene Emissions:	3.63	lbs/year	3.63	lbs/year
	0.00	tons/year	0.00	tons/year
	0.00	lb/hr	0.00	lb/hr
n-Hexane Emissions:	31.47	lbs/year	31.47	lbs/year
	0.02	tons/year	0.02	tons/year
	0.00	lb/hr	0.00	lb/hr

Mustang Creek Operating LLC**Callaway 3-33****Enclosed Combustor Detail Sheet – Produced Gas**

Source ID Number	Gas Flare	Maximum Vapors Combusted	0.02 MMscf/day
Number of combustors	1	Vapors combusted (based on flare throughput)	22.24 Mscf/day
Fuel Heating Value	1,256 BTU/scf	Potential fuel usage	8.12 MMscf/yr
Combustor Max Input Rating	TBD MMBtu/hr	Actual combustor input rating	1.16 MMBtu/hr
Make/Model:	Leed Flare		
Serial Number #:	TBD		

Potential Emissions

Pollutant	Emission Factor (lb/MMBtu)	Hrs of Operation (hrs/yr)	(lb/hr)	Estimated Emissions (tpy)	(lb/yr)	Source of Emission Factors
NOx	0.068	8,760	0.079	0.35	693.02	AP-42 Table 13.5-1
CO	0.31	8,760	0.361	1.58	3,159.33	AP-42 Table 13.5-1

Actual Emissions:

Pollutant	Emission Factor (lb/MMBtu)	Hrs of Operation (hrs/yr)	(lb/hr)	Estimated Emissions (tpy)	(lb/yr)	Source of Emission Factors
NOx	0.068	8,760	0.055	0.29	481.26	AP-42 Table 13.5-1
CO	0.31	8,760	0.250	1.32	2,193.98	AP-42 Table 13.5-1

Mustang Creek Operating LLC
Callaway 3-33

Produced Gas Venting Details (ACTUAL)

Source ID Number	Produced Gas Venting	Gas Used Hourly	772.06 scf/hr
Gas Analysis	Site-Specific	Gas Used Daily	18,529.41 scf/day
Potential operation	8,760 hr/yr	Gas Used Yearly	6.76 MMscf/year

Component	Molecular Weight (lb/lb-mole)	Mole (Vol.) Percent (%)	Gas Weight (lb/lb-mol)	Weight Percent (%)	Venting Rate (Mscf/day)	Venting Rate (lb/hr)	Venting Rate (tons/yr)
Nitrogen	28.013	11.5049%	0.0322	11.9647%	2.1318	6.5653	28.7560
Methane	16.041	53.1170%	0.0852	31.6318%	9.8423	17.3571	76.0239
Carbon Dioxide	44.01	0.5681%	0.0025	0.9282%	0.1053	0.5093	2.2308
Hydrogen Sulfide	34.08	0.0000%	0.0000	0.0000%	0.0000	0.0000	0.0000
Helium/Oxygen/Argon	4.0000	0.0119%	0.0000	0.0018%	0.0022	0.0010	0.0042
Ethane	30.063	14.9130%	0.0448	16.6439%	2.7633	9.1329	40.0021
Propane	44.092	11.7569%	0.0518	19.2447%	2.1785	10.5600	46.2528
i-Butane	58.118	1.5479%	0.0090	3.3397%	0.2868	1.8326	8.0267
n-Butane	58.118	4.0093%	0.0233	8.6504%	0.7429	4.7467	20.7905
i-Pentane	72.114	0.8555%	0.0062	2.2903%	0.1585	1.2568	5.5046
n-Pentane	72.114	0.8306%	0.0060	2.2237%	0.1539	1.2202	5.3444
i-Hexanes	86.18	0.3160%	0.0027	1.0110%	0.0586	0.5548	2.4298
n-Hexane	86.18	0.1065%	0.0009	0.3407%	0.0197	0.1870	0.8189
Benzene	78.12	0.0377%	0.0003	0.1093%	0.0070	0.0600	0.2628
Cyclohexane	84.16	0.1168%	0.0010	0.3649%	0.0216	0.2002	0.8771
i-Heptanes	100.21	0.0793%	0.0008	0.2950%	0.0147	0.1619	0.7090
n-Heptane	100.21	0.0000%	0.0000	0.0000%	0.0000	0.0000	0.0000
Toluene	92.15	0.0099%	0.0001	0.0339%	0.0018	0.0186	0.0814
i-Octanes	114.23	0.0000%	0.0000	0.0000%	0.0000	0.0000	0.0000
n-Octane	114.23	0.2023%	0.0023	0.8579%	0.0375	0.4707	2.0619
Ethylbenzene	106.17	0.0005%	0.0000	0.0020%	0.0001	0.0011	0.0047
Xylenes	106.17	0.0049%	0.0001	0.0193%	0.0009	0.0106	0.0464
2,2,4 Trimethylpentane	114.23	0.0110%	0.0001	0.0466%	0.0020	0.0256	0.1121
i-Nonanes	128.26	0.0000%	0.0000	0.0000%	0.0000	0.0000	0.0000
n-Nonane	128.26	0.0000%	0.0000	0.0000%	0.0000	0.0000	0.0000
i-Decanes	142.29	0.0000%	0.0000	0.0000%	0.0000	0.0000	0.0000
n-Decane	142.29	0.0000%	0.0000	0.0000%	0.0000	0.0000	0.0000
Undecanes	156.31	0.0000%	0.0000	0.0000%	0.0000	0.0000	0.0000
Dodecanes	170.33	0.0000%	0.0000	0.0000%	0.0000	0.0000	0.0000
Tridecanes	184.36	0.0000%	0.0000	0.0000%	0.0000	0.0000	0.0000
Tetradecanes Plus	184.36	0.0000%	0.0000	0.0000%	0.0000	0.0000	0.0000
VOC SUBTOTAL		19.89%	0.1046	38.8296%	3.6846	21.3067	93.3232
HAP SUBTOTAL		0.17%	0.0015	0.5519%	0.0316	0.3028	1.3264
TOTAL		100.00%	0.2694	100.0000%	18.5294	54.8722	240.3402

Emissions Controlled (by flare, 95% control efficiency)

Pollutant	Hrs of Operation (hrs/yr)	Vent Gas Emissions (lb/hr)	Vent Gas Emissions (tpy)	Vent Gas Emissions (lb/yr)	Source of Emission Factor
VOC	8,760	1.07	4.67	9,332.32	Vent Gas Emissions
HAPs	8,760	0.02	0.066	132.64	Vent Gas Emissions

Mustang Creek Operating LLC
Callaway 3-33

Produced Gas Venting Details (PTE)

Source ID Number	Produced Gas Venting	Gas Used Hourly (PTE)	926.47 scf/hr
Gas Analysis	Site-Specific	Gas Used Daily (PTE)	22,235 scf/day
Potential operation	8,760 hr/yr	Gas Used Yearly (PTE)	8.12 MMscf/year

Component	Molecular Weight (lb/lb-mole)	Mole (Vol.) Percent (%)	Gas Weight (lb/lb-mol)	Weight Percent (%)	Venting Rate (Mscf/day)	Venting Rate (lb/hr)	Venting Rate (tons/yr)
Nitrogen	28.013	11.5049%	0.0322	11.9647%	2.5581	7.8783	34.5071
Methane	16.041	53.1170%	0.0852	31.6318%	11.8107	20.8285	91.2287
Carbon Dioxide	44.01	0.5681%	0.0025	0.9282%	0.1263	0.6112	2.6770
Hydrogen Sulfide	34.08	0.0000%	0.0000	0.0000%	0.0000	0.0000	0.0000
Helium/Oxygen/Argon	4.0000	0.0119%	0.0000	0.0018%	0.0026	0.0012	0.0051
Ethane	30.063	14.9130%	0.0448	16.6439%	3.3159	10.9595	48.0025
Propane	44.092	11.7569%	0.0518	19.2447%	2.6142	12.6720	55.5033
i-Butane	58.118	1.5479%	0.0090	3.3397%	0.3442	2.1991	9.6321
n-Butane	58.118	4.0093%	0.0233	8.6504%	0.8915	5.6960	24.9486
i-Pentane	72.114	0.8555%	0.0062	2.2903%	0.1902	1.5081	6.6055
n-Pentane	72.114	0.8306%	0.0060	2.2237%	0.1847	1.4642	6.4132
i-Hexanes	86.18	0.3160%	0.0027	1.0110%	0.0703	0.6657	2.9158
n-Hexane	86.18	0.1065%	0.0009	0.3407%	0.0237	0.2244	0.9827
Benzene	78.12	0.0377%	0.0003	0.1093%	0.0084	0.0720	0.3153
Cyclohexane	84.16	0.1168%	0.0010	0.3649%	0.0260	0.2403	1.0525
i-Heptanes	100.21	0.0793%	0.0008	0.2950%	0.0176	0.1943	0.8508
n-Heptane	100.21	0.0000%	0.0000	0.0000%	0.0000	0.0000	0.0000
Toluene	92.15	0.0099%	0.0001	0.0339%	0.0022	0.0223	0.0977
i-Octanes	114.23	0.0000%	0.0000	0.0000%	0.0000	0.0000	0.0000
n-Octane	114.23	0.2023%	0.0023	0.8579%	0.0450	0.5649	2.4742
Ethylbenzene	106.17	0.0005%	0.0000	0.0020%	0.0001	0.0013	0.0057
Xylenes	106.17	0.0049%	0.0001	0.0193%	0.0011	0.0127	0.0557
2,2,4 Trimethylpentane	114.23	0.0110%	0.0001	0.0466%	0.0024	0.0307	0.1345
i-Nonanes	128.26	0.0000%	0.0000	0.0000%	0.0000	0.0000	0.0000
n-Nonane	128.26	0.0000%	0.0000	0.0000%	0.0000	0.0000	0.0000
i-Decanes	142.29	0.0000%	0.0000	0.0000%	0.0000	0.0000	0.0000
n-Decane	142.29	0.0000%	0.0000	0.0000%	0.0000	0.0000	0.0000
Undecanes	156.31	0.0000%	0.0000	0.0000%	0.0000	0.0000	0.0000
Dodecanes	170.33	0.0000%	0.0000	0.0000%	0.0000	0.0000	0.0000
Tridecanes	184.36	0.0000%	0.0000	0.0000%	0.0000	0.0000	0.0000
Tetradecanes Plus	184.36	0.0000%	0.0000	0.0000%	0.0000	0.0000	0.0000
VOC SUBTOTAL		19.8851%	0.1046	38.8296%	4.4215	25.5680	111.9878
HAP SUBTOTAL		0.1705%	0.0015	0.5519%	0.0379	0.3634	1.5916
TOTAL		100.0000%	0.2694	100.0000%	22.2353	65.8466	288.4082

Emissions Controlled (by flare, 95% control efficiency)

Pollutant	Hrs of Operation (hrs/yr)	Vent Gas Emissions (lb/hr)	Vent Gas Emissions (tpy)	Source of Emission Factor
VOC	8,760	1.28	5.60	Vent Gas Emissions
HAPs	8,760	0.02	0.080	Vent Gas Emissions

Mustang Creek Operating LLC

Callaway 3-33

Heaters Emission Detail Sheet (Separators, Heater-Treaters, Tank, and/or Line)

Source Description	1 Heaters	Potential operation	8,760	hr/yr
Net Fuel Heating Value	1,256 Btu/scf	Potential fuel usage	3.49	MMscf/yr
Fuel Heating Value-Avg	1,256 Btu/scf	Fuel Heating Value-Producing	1,256	Btu/scf
Heat Input (Total)	0.50 MMBtu/hr (total)	Burner Efficiency ¹	80	%
Heat Input 3-phase Separators	0.5 MMBtu/hr (each)	Destruction Efficiency ²	0	%

¹ Since Tank Heater and Separator burner efficiencies are unknown, the maximum allowable value of 80% is used to calculate potential

² 0% destruction and removal efficiency (DRE) is used to calculate uncontrolled emissions from the heaters and separator burners.

Potential Emissions

Pollutant	Emission Factor (lb/MMscf)	Nominal Rating (MMBtu/hr)	Hrs of Operation (hrs/yr)	Estimated Emissions		Source of Emission Factor
				(lb/hr)	(tpy)	
NOx	100.00	0.50	8,760	0.05	0.22	AP-42 Table 1.4-1
CO	84.00	0.50	8,760	0.04	0.18	AP-42 Table 1.4-1
TOC	11.00	0.50	8,760	0.01	0.02	AP-42 Table 1.4-2
VOC	5.50	0.50	8,760	0.00	0.01	AP-42 Table 1.4-2
SO ₂	0.60	0.50	8,760	0.00	0.00	AP-42 Table 1.4-2
PM/PM ₁₀ /PM _{2.5}	7.60	0.50	8,760	0.00	0.02	AP-42 Table 1.4-2
HAPs	NA	0.50	8,760	0.00	0.00	Summary of HAPs
Benzene	2.10E-03	0.50	8,760	0.00	0.00	AP-42 Table 1.4-3
Toluene	3.40E-03	0.50	8,760	0.00	0.00	AP-42 Table 1.4-3
n-Hexane	1.80	0.50	8,760	0.00	0.00	AP-42 Table 1.4-3
Formaldehyde	7.50E-02	0.50	8,760	0.00	0.00	AP-42 Table 1.4-3

Natural gas burner emissions for criteria pollutants can be estimated using the following equation:

$$E_X = \frac{EF_X \times BR \times 10^6 \times HO}{\frac{B_{EFF}}{100} \times HV_{Avg} \times 10^6 \times 2000} \times \frac{HV_{Prod}}{HV_{Avg}} \times \left(\frac{(100 - DRE)}{100} \right)$$

where:

E_x = emissions for pollutant X (tpy);

EF_x = emission factor for pollutant X (lb/MMscf);

BR = burner rating (MMBtu/hr);

B_{Eff} = burner efficiency (%);

HO = annual hours of operation (hr/yr);

HV_{Avg} = average gas heating value (Btu/scf);

HV_{Prod} = produced gas heating value (Btu/scf);

DRE = destruction and removal efficiency (%);

1-ton = 2000-lb;



Company: Mustang Creek Operating LLC
Site: Callaway 3-33

Operation (hrs/yr) 8,760

Fugitive Component Counts & Emissions

Service	Component Type	Count	TOC EF lb/hr-source	TOC EF kg/hr-source	Control (%)	VOC		Benzene		Toluene		Ethylbenzene		Xylene		n-Hexane		2,2,4 Trimethylpentane	
						Uncontrolled (tpy)	Controlled (tpy)	Uncontrolled (lb/yr)	Controlled (lb/yr)	Uncontrolled (lb/yr)	Controlled (lb/yr)	Uncontrolled (lb/yr)	Controlled (lb/yr)	Uncontrolled (lb/yr)	Controlled (lb/yr)	Uncontrolled (lb/yr)	Controlled (lb/yr)	Uncontrolled (lb/yr)	Controlled (lb/yr)
Gas	Valves	62	5.51E-05	2.50E-05	0.0%	0.01	0.01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0
	Pump Seals	0	7.72E-04	3.50E-04	0.0%	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Others	0	2.65E-04	1.20E-04	0.0%	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Connectors	193	2.20E-05	1.00E-05	0.0%	0.01	0.01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0
	Flanges	0	1.26E-05	5.70E-06	0.0%	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Open-ended lines	8	3.31E-05	1.50E-05	0.0%	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Oil	Valves	11	4.19E-05	1.90E-05	0.0%	0.00	0.00	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0
	Pump Seals	0	1.12E-03	5.10E-04	0.0%	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Others	1	2.43E-04	1.10E-04	0.0%	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0
	Connectors	14	2.14E-05	9.70E-06	0.0%	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0
	Flanges	22	5.29E-06	2.40E-06	0.0%	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Open-ended lines	0	3.09E-05	1.40E-05	0.0%	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Oil	Valves	0	1.85E-05	8.40E-06	0.0%	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Pump Seals	0		0.00E+00															
	Others	0	7.05E-05	3.20E-05	0.0%	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Connectors	0	1.65E-05	7.50E-06	0.0%	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Flanges	0	8.60E-07	3.90E-07	0.0%	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Open-ended lines	0	1.59E-05	7.20E-06	0.0%	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water/Oil	Valves	11	2.14E-05	9.70E-06	0.0%	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Pump Seals	0	5.29E-05	2.40E-05	0.0%	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Others	1	1.30E-04	5.90E-05	0.0%	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Connectors	14	2.20E-05	1.00E-05	0.0%	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Flanges	22	6.39E-06	2.90E-06	0.0%	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Open-ended lines	0	7.72E-06	3.50E-06	0.0%	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTALS (tpy)						0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTALS (lb/yr)						359		44	44	0.16	0.16	0.16	0.16	0.05	0.05	0.14	0.14	0.48	0.48
With safety factor:						1													
TOTALS (tpy)								0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTALS (lb/yr)								43.88	43.88	0.16	0.16	0.16	0.16	0.05	0.05	0.14	0.14	0.48	0.48

Emission Factor Source: EPA-453/R-95-017, Table 2-8

Stream VOC Fraction (wt)

Gas	0.3883
Light Oil	0.9941
Heavy Oil	0.0000
Water/Oil	1.0000

Stream HAP Components (wt fraction)

HAP	Gas	Light Oil	Heavy Oil	Water/Oil
Benzene	1.09E-03	8.64E-03	0	0.00E+00
Toluene	3.39E-04	1.43E-02	0	0.00E+00
Ethylbenzene	1.97E-05	5.08E-03	0	0.00E+00
Xylene	1.93E-04	1.28E-02	0	0.00E+00
n-Hexane	3.41E-03	2.43E-02	0	0.00E+00
2,2,4 Trimethylpentane	4.66E-04	2.11E-03	0	0.00E+00

Notes

- 1) The other equipment type was derived from compressors, diaphragms, drains, dump arms, hatches, instruments, meters, pressure relief valves, polished rods, relief valves and vents. This "other" equipment type should be applied for any equipment type other than connectors, flanges, open-ended lines, pumps or valves.
- 2) Water/Oil emission factors apply to water streams in oil service with a water content greater than 50%, from the point of origin to the point where the water content reaches 99%. For water streams with a water content greater than 99%, the emission rate is considered negligible.
- 3) Source counts estimated from 40 CFR Part 98, Subpart W, Table W-1C and are not site-specific.

Mustang Creek Operating LLC
Callaway 3-33
Pumpjack Engine - ENG-1

Engine Build Year: 2014
Engine Manufacturer: Cummins G 5.9
Horsepower: 49

Rebuild Year: n/a
Engine Type: 4-stroke Rich Burn
Serial Number: 0

Given

Fuel Usage	7.92	Mscfd	
Fuel Usage	330.20	Scf/hr	
Fuel Usage	2.90	MMscf/yr	
NOx Emission Factor (Uncontrolled)	13.04	lb/MMBtu	AP-42 - Table 3.2-3 - 4-stroke rich-burn engines
NOx Emission Factor (Controlled)	2.80	g/hp-hr	NSPS Subpart JJJJ Limit
CO Emission Factor (Uncontrolled)	14.38	g/hp-hr	Manufacturer Spec
CO Emission Factor (Controlled)	4.80	g/hp-hr	NSPS Subpart JJJJ Limit
Total PM Emission Factor	0.01941	lb/MMBtu	AP-42 - Table 3.2-3 - 4-stroke rich-burn engines
Total PM ₁₀ /PM _{2.5} Emission Factor	0.00950	lb/MMBtu	AP-42 - Table 3.2-3 - 4-stroke rich-burn engines
VOC Emission Factor (Uncontrolled)	2.80	g/hp-hr	Manufacturer Spec
VOC Emission Factor (Controlled)	2.80	g/hp-hr	No Controls
SOx Emission Factor	0.000588	lb/MMBtu	AP-42 - Table 3.2-3 - 4-stroke rich-burn engines
Formaldehyde Emission Factor (Unc)	0.020500	lb/MMBtu	AP-42 - Table 3.2-3 - 4-stroke rich-burn engines
Formaldehyde Emission Factor (Con)	0.020500	lb/MMBtu	No Controls
Acetaldehyde Emission Factor	0.002790	lb/MMBtu	AP-42 - Table 3.2-3 - 4-stroke rich-burn engines
Acrolein Emission Factor	0.002630	lb/MMBtu	AP-42 - Table 3.2-3 - 4-stroke rich-burn engines
Benzene Emission Factor	0.001580	lb/MMBtu	AP-42 - Table 3.2-3 - 4-stroke rich-burn engines
Methanol Emission Factor	0.003060	lb/MMBtu	AP-42 - Table 3.2-3 - 4-stroke rich-burn engines
Engine Rating	49	hp	
% runtime in field	100%		
Produced Gas Heating Value	1,256	Btu/scf	Site-Specific Analysis
Fuel Consumption Rate	8,462	Btu/hp-hr	Manufacturer Spec
Conversion Factor	24	hr/day	
Conversion Factor	1,000,000	Btu/MMBtu	
Conversion Factor	8,760	hr/yr	
Conversion Factor	2,000	lb/ton	
Conversion Factor	454	g/lb	

Calculations

Pollutant	Emissions (Uncontrolled)			Emissions (Controlled)		
	lb/hr	tons/year	lb/year	lb/hr	tons/year	lb/year
NOx	5.41	23.68	47,364.26	0.30	1.32	2,647.30
CO	1.55	6.80	13,595.75	0.52	2.27	4,538.22
VOC	0.30	1.32	2,647.30	0.30	1.32	2,647.30
PM	8.05E-03	3.53E-02	70.50	8.05E-03	3.53E-02	70.50
PM ₁₀	3.94E-03	1.73E-02	34.51	3.94E-03	1.73E-02	34.51
PM _{2.5}	3.94E-03	1.73E-02	34.51	3.94E-03	1.73E-02	34.51
SO ₂	2.44E-04	1.07E-03	2.14	2.44E-04	1.07E-03	2.14
HAPs	1.27E-02	0.06	111.00	1.27E-02	0.06	111.00
Formaldehyde	8.50E-03	0.04	74.46	8.50E-03	0.04	74.46
Acetaldehyde	1.16E-03	5.07E-03	10.13	1.16E-03	5.07E-03	10.13
Acrolein	1.09E-03	4.78E-03	9.55	1.09E-03	4.78E-03	9.55
Benzene	6.55E-04	2.87E-03	5.74	6.55E-04	2.87E-03	5.74
Methanol	1.27E-03	5.56E-03	11.11	1.27E-03	5.56E-03	11.11

Equations

$\text{Nox/CO/VOC/Formaldehyde} = (\text{Emission Factor} \times \text{Engine Rating/Conversion Factor})$
 $\text{Pollutants} = \text{Emission Factor} \times (\text{Fuel Usage}/1000/(24 \text{ hrs/day})) \times \text{Fuel Heating Value} \times \text{Conversion Factor}$



ATTACHMENT D
ANALYSES

EXTENDED NATURAL GAS LIQUID ANALYSIS

SAMPLE DATA

PROJECT NO.....	LLTE6089	SAMPLE ID.....	Pressurized Liquid
COMPANY NAME.....	LT Environmental	ANALYSIS DATE.....	7/19/2016
SITE.....	Callaway 3-33	SAMPLE DATE.....	7/14/2016
UNIT ID.....	Callaway 3-33	CYLINDER NO.....	38674
SAMPLED BY.....	DW	LAB ANALYST.....	CB

FIELD DATA

SAMPLE PRESSURE.....	37 psig	SAMPLE TEMP.....	86 F
AMBIENT PRESSURE.....	12.1 psi	AMBIENT TEMP.....	75 F

COMMENTS: Separator Gauge Readings: 39 psig, 78 F. Sample Probe Pressure: 37 psig. IR Gun Surface Temperature: 85-86 F.

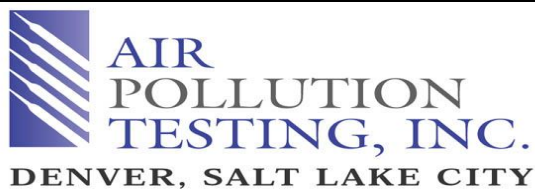
LABORATORY DATA

COMPONENT	MOLE %	WT%	LV%
CARBON DIOXIDE.....	0.0268	0.0071	0.0071
NITROGEN (AIR).....	0.0194	0.0034	0.0031
METHANE.....	0.7740	0.0752	0.2038
ETHANE.....	1.7217	0.3137	0.7151
PROPANE.....	4.3872	1.1721	1.8771
ISOBUTANE.....	1.3089	0.4609	0.6652
N-BUTANE.....	5.2092	1.8344	2.5505
ISOPENTANE.....	3.0257	1.3226	1.7185
N-PENTANE.....	3.9505	1.7269	2.2239
CYCLOPENTANE.....	0.5862	0.2491	0.2696
N-HEXANE.....	3.1066	1.6220	1.9840
CYCLOHEXANE.....	0.9524	0.4856	0.5031
OTHER HEXANES.....	6.0557	3.1312	3.6468
OTHER HEPTANES.....	6.7711	4.0723	4.6001
METHYLCYCLOHEXANE.....	1.7121	1.0185	1.0683
2,2,4 TRIMETHYLPENTANE.....	0.2038	0.1410	0.1590
BENZENE.....	1.2189	0.5768	0.5293
TOLUENE.....	1.7124	0.9559	0.8901
ETHYLBENZENE.....	0.5270	0.3390	0.3157
XYLENES.....	1.3299	0.8554	0.7957
OTHER OCTANES.....	5.8433	4.0075	4.4120
NONANES.....	4.3872	3.4065	3.7381
DECANES PLUS.....	45.1699	72.2227	67.1241
TOTAL	100.00000	100.00000	100.00000

SAMPLE FRACTIONS

	TOTAL	C6+	C10+
SPG LIQUID.....	0.81	0.84	0.87
API GRAVITY.....	42.8	37.3	30.5
MOLECULAR WEIGHT.....	165.1	194.0	263.9
ABSOLUTE DENSITY (lbs/gal).....	6.8	7.0	7.3
HEATING VALUE LIQUID IDL GAS (GBTU/gal).....	80240.9	128680.2	131229.5
GBTU/GAL LIQUID.....	125589.0	128584.4	130172.3
NBTU/GAL LIQUID.....	131162.4	134013.2	139128.9
VAPOR/LIQUID (SCF/gal).....	17.9	16.3	13.9
VAPOR PRESSURE (psia).....	66.8	1.0	0.0

ANALYTICAL PROCEDURES TAKEN FROM GPA-2186, ASTM D6730-01(2011), ASTM D7169.



5530 Marshall Street
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EXTENDED NATURAL GAS LIQUID ANALYSIS
DHA COMPONENT ANALYSIS

SAMPLE DATA

PROJECT NO.....	LLTE6089	SAMPLE ID.....	Pressurized Liquid
COMPANY NAME.....	LT Environmental	ANALYSIS DATE.....	7/19/2016
SITE.....	Callaway 3-33	SAMPLE DATE.....	7/14/2016
UNIT ID.....	Callaway 3-33	CYLINDER NO.....	38674
SAMPLED BY.....	DW	LAB ANALYST.....	CB

FIELD DATA

SAMPLE PRESSURE.....	37 psig	SAMPLE TEMP.....	86 F
AMBIENT PRESSURE.....	12.1 psi	AMBIENT TEMP.....	75 F

COMMENTS: Separator Gauge Readings: 39 psig, 78 F. Sample Probe Pressure: 37 psig. IR Gun Surface Temperature: 85-86 F.

LABORATORY DATA

COMPONENT	MOLE %	WT%	LV%
Air	0.0194	0.0034	0.0031
Carbon dioxide	0.0268	0.0071	0.0071
Methane	0.7740	0.0752	0.2038
Ethane	1.7217	0.3137	0.7151
Propane	4.3872	1.1721	1.8771
Isobutane	1.3089	0.4609	0.6652
n-Butane	5.2092	1.8344	2.5505
Cyclopentane	0.5862	0.2491	0.2696
Isopentane	3.0257	1.3226	1.7185
n-Pentane	3.9505	1.7269	2.2239
Unknown C5s	0.0000	0.0000	0.0000
Neopentane	0.0000	0.0000	0.0000
Benzene	1.2189	0.5768	0.5293
Methylcyclopentane	2.4988	1.2741	1.3725
Cyclohexane	0.9524	0.4856	0.5031
2,2-Dimethylbutane	0.0197	0.0103	0.0128
Neohexane	0.0000	0.0000	0.0000
2-Methylpentane	1.8711	0.9769	1.2051
2,3-Dimethylbutane	0.1746	0.0912	0.1111
3-Methylpentane	1.3814	0.7212	0.8750
Unknown C6s	0.1101	0.0575	0.0703
n-Hexane	3.1066	1.6220	1.9840
Toluene	1.7124	0.9559	0.8901
1,1-Dimethylcyclopentane	0.2057	0.1223	0.1309
1,t-3-Dimethylcyclopentane	0.5881	0.3498	0.3771
1,c-3-Dimethylcyclopentane	0.7843	0.4665	0.5048
1,t-2-Dimethylcyclopentane	1.1005	0.6547	0.7030
Methylcyclohexane	1.7121	1.0185	1.0683
1,c-2-Dimethylcyclopentane	0.1726	0.1027	0.1072
Ethylcyclopentane	0.2922	0.1738	0.1830
Cycloheptane	0.0000	0.0000	0.0000
2,2-Dimethylpentane	0.0128	0.0078	0.0093
2,4-Dimethylpentane	0.1673	0.1016	0.1217
2,2,3-Trimethylbutane	0.0207	0.0126	0.0147
3,3-Dimethylpentane	0.0360	0.0219	0.0255
2-Methylhexane	0.5551	0.3370	0.4003
2,3-Dimethylpentane	0.2865	0.1739	0.2018
3-Methylhexane	0.7993	0.4852	0.5694
3-Ethylpentane	0.1682	0.1021	0.1180
n-Heptane	1.4705	0.8927	1.0536
Triptane	0.0000	0.0000	0.0000
Unknown C7s	0.1113	0.0676	0.0798

Styrene	0.0000	0.0000	0.0000
Ethylbenzene	0.5270	0.3390	0.3157
o-Xylene	0.4033	0.2594	0.2381
m-Xylene	0.6251	0.4021	0.3757
p-Xylene	0.3015	0.1940	0.1819
1,1,3-Trimethylcyclopentane	0.0000	0.0000	0.0000
1,t-2,c-4-Trimethylcyclopentane	0.3166	0.2152	0.2324
1,t-2,c-3-Trimethylcyclopentane	0.5528	0.3759	0.4024
1,c-3-Dimethylcyclohexane	0.0361	0.0246	0.0259
1,t-4-Dimethylcyclohexane	0.1348	0.0917	0.0970
1,1-Dimethylcyclohexane	0.0707	0.0481	0.0497
1-Methyl-c-3-ethylcyclopentane	0.1077	0.0732	0.0765
1-Methyl-t-2-ethylcyclopentane	0.2925	0.1989	0.2086
1,1,2-Trimethylcyclopentane	0.1374	0.0934	0.0976
1,c-2,t-4-Trimethylcyclopentane	0.0000	0.0000	0.0000
1,c-2,t-3-Trimethylcyclopentane	0.3927	0.2670	0.2797
1-Methyl-t-3-ethylcyclopentane	0.0935	0.0636	0.0673
1-Methyl-1-ethylcyclopentane	0.0000	0.0000	0.0000
1,t-3-Dimethylcyclohexane	0.0000	0.0000	0.0000
1,c-4-Dimethylcyclohexane	0.0000	0.0000	0.0000
1,c-2,c-3-Trimethylcyclopentane	0.2979	0.2025	0.2098
Isopropylcyclopentane	0.0456	0.0310	0.0322
1-Ethyl-c-2-methylcyclopentane	0.0000	0.0000	0.0000
1,c-2-Dimethylcyclohexane	0.0354	0.0241	0.0244
n-Propylcyclopentane	0.4764	0.3239	0.3368
Ethylcyclohexane	0.0000	0.0000	0.0000
Cyclooctane	0.0000	0.0000	0.0000
n-Octane	1.0002	0.6922	0.7957
Unknown C8s	0.0128	0.0088	0.0102
Dilsobutyl	0.0000	0.0000	0.0000
Isooctane	0.0000	0.0000	0.0000
2,2,4-Trimethylpentane	0.2038	0.1410	0.1590
2,2-Dimethylhexane	0.3540	0.2450	0.2842
2,4-Dimethylhexane	0.0857	0.0593	0.0683
2,5-Dimethylhexane	0.0000	0.0000	0.0000
2,2,3-Trimethylpentane	0.0000	0.0000	0.0000
3,3-Dimethylhexane	0.0000	0.0000	0.0000
2,3,4-Trimethylpentane	0.0208	0.0144	0.0161
2,3-Dimethylhexane	0.0642	0.0444	0.0504
2-Methylheptane	0.7952	0.5503	0.6361
4-Methylheptane	0.1642	0.1137	0.1302
3-Methylheptane	0.2205	0.1526	0.1745
3,4-Dimethylhexane	0.0251	0.0173	0.0195
3-Ethylhexane	0.1103	0.0764	0.0864
C9	4.3872	3.4065	3.7381
C10	4.8470	4.1782	4.6199
C11	3.5374	3.3500	3.6542
C12	3.1131	3.2127	3.4633
C13	3.4561	3.8604	3.7970
C14	2.9571	3.5543	3.4499
C15	2.4445	3.1460	3.0319
C16	1.8772	2.5754	2.4615
C17	1.9421	2.8294	2.7171
C18	1.8217	2.8089	2.6878
C19	1.6935	2.7551	2.6056
C20	1.4018	2.3997	2.2564
C21	1.1151	2.0036	1.8731
C22	1.1876	2.2349	2.0773
C23	0.9560	1.8802	1.7397
C24	0.8937	1.8337	1.6889
C25	0.8410	1.7970	1.6477
C26	0.7337	1.6300	1.4878
C27	0.7541	1.7395	1.5806
C28	0.6130	1.4662	1.3263
C29	0.5657	1.4010	1.2632
C30+	8.4188	21.5665	17.6948
TOTAL	100.0000	100.0000	100.0000

EXTENDED NATURAL GAS LIQUIDS ANALYSIS
BY CARBON NUMBER

SAMPLE DATA

PROJECT NO..... LLTE6089
COMPANY NAME..... LT Environmental
SITE..... Callaway 3-33
UNIT ID..... Callaway 3-33
SAMPLED BY..... DW

SAMPLE ID..... Pressurized Liquid
ANALYSIS DATE..... 7/19/2016
SAMPLE DATE..... 7/14/2016
CYLINDER NO..... 38674
LAB ANALYST..... CB

FIELD DATA

SAMPLE PRESSURE..... 37 psig
AMBIENT PRESSURE..... 12.1 psi

SAMPLE TEMP..... 86 F
AMBIENT TEMP..... 75 F

COMMENTS: Separator Gauge Readings: 39 psig, 78 F. Sample Probe Pressure: 37 psig. IR Gun Surface Temperature: 85-86 F.

LABORATORY DATA

COMPONENT	MOLE %	WT%	LV%
Air	0.0194	0.0034	0.0031
Carbon dioxide	0.0268	0.0071	0.0071
C1	0.7740	0.0752	0.2038
C2	1.7217	0.3137	0.7151
C3	4.3872	1.1721	1.8771
C4	6.5181	2.2953	3.2157
C5	7.5625	3.2986	4.2120
C6	11.3337	5.8157	6.6632
C7	10.1956	6.0468	6.5584
C8	7.9040	5.3429	5.6823
C9	4.3872	3.4065	3.7381
C10	4.8470	4.1782	4.6199
C11	3.5374	3.3500	3.6542
C12	3.1131	3.2127	3.4633
C13	3.4561	3.8604	3.7970
C14	2.9571	3.5543	3.4499
C15	2.4445	3.1460	3.0319
C16	1.8772	2.5754	2.4615
C17	1.9421	2.8294	2.7171
C18	1.8217	2.8089	2.6878
C19	1.6935	2.7551	2.6056
C20	1.4018	2.3997	2.2564
C21	1.1151	2.0036	1.8731
C22	1.1876	2.2349	2.0773
C23	0.9560	1.8802	1.7397
C24	0.8937	1.8337	1.6889
C25	0.8410	1.7970	1.6477
C26	0.7337	1.6300	1.4878
C27	0.7541	1.7395	1.5806
C28	0.6130	1.4662	1.3263
C29	0.5657	1.4010	1.2632
C30+	8.4188	21.5665	17.6948
TOTAL	100.0000	100.0000	100.0000

The following files were used in generating this report:

C:\Resultfiles1\DHA_2_38674_160720115449.xml
C:\Chem32\2\DATA\DHA\38674_07202016_1206.csv
C:\AscentSimdis\Output\Calloway_07202016.csv



**AIR
POLLUTION
TESTING, INC.**
DENVER, SALT LAKE CITY

5530 Marshall Street
Arvada, Colorado 80002
Phone: 303-420-5949
Fax: 303-420-5920

PHYSICAL PROPERTY TESTING

SAMPLE DATA

PROJECT NO..... LLTE6089
COMPANY NAME..... LT Environmental
SITE..... Callaway 3-33
UNIT ID..... Tank
SAMPLED BY..... DW

SAMPLE ID..... Sales Oil
ANALYSIS DATE..... 7/19/2016
SAMPLE DATE..... 7/14/2016
CYLINDER NO..... Jar
LAB ANALYST..... CB

FIELD DATA

SAMPLE PRESSURE..... NA
AMBIENT PRESSURE..... 12.1 psi

SAMPLE TEMP..... 81 F
AMBIENT TEMP..... 75 F

COMMENTS:

LABORATORY DATA

API GRAVITY = 37.4

REID VAPOR PRESSURE = 6.6 psi

NOTES: API GRAVITY MEASURED USING ASTM D1298/D287

VAPOR PRESSURE MEASURED USING ASTM D6377/D6378

<p>Mustang Creek Operating LLC Callaway 3-33 Light Oil Composition Calculations Site-Specific sample from the Callaway 3-33 facility, collected on 6/6/16</p>
--

Component	Molecular Weight (lb/lb-mol)	Mole (Vol.) Percent (%)	Mole Frac.	Gas Weight (lb/lb-mol)	Weight Percent (%)	LHV	
						BTU Content	
						Btu/scf	Btu/scf*Mole Frac
Nitrogen	28.013	0.0194%	0.00019	0.01	0.0049%	0.00	0.00
Methane	16.041	0.7740%	0.00774	0.12	0.1127%	909.40	7.04
Carbon Dioxide	44.01	0.0000%	0.00000	0.00	0.0000%	0.00	0.00
Hydrogen Sulfide	34.08	0.0000%	0.00000	0.00	0.0000%	586.80	0.00
Ethane	30.063	1.7217%	0.01722	0.52	0.4699%	1,618.70	27.87
Propane	44.092	4.3872%	0.04387	1.93	1.7560%	2,314.90	101.56
i-Butane	58.118	1.3089%	0.01309	0.76	0.6905%	3,000.40	39.27
n-Butane	58.118	5.2092%	0.05209	3.03	2.7482%	3,010.80	156.84
i-Pentane	72.114	3.0257%	0.03026	2.18	1.9807%	3,699.00	111.92
n-Pentane	72.114	3.9505%	0.03951	2.85	2.5861%	3,706.90	146.44
2,2,4 Trimethylpentane	114.23	0.2038%	0.00204	0.23	0.2113%	0.00	0.00
i-Hexanes	86.18	7.7679%	0.07768	6.69	6.0769%	4,392.70	341.22
n-Hexane	86.18	3.1066%	0.03107	2.68	2.4303%	4,404.10	136.82
Benzene	78.12	1.2189%	0.01219	0.95	0.8644%	3,591.10	43.77
Cyclohexane	84.16	1.5386%	0.01539	1.29	1.1754%	4,179.90	64.31
i-Heptanes	100.21	0.0000%	0.00000	0.00	0.0000%	5,100.30	0.00
n-Heptane	100.21	6.7711%	0.06771	6.79	6.1595%	5,100.30	345.35
Toluene	92.15	1.7124%	0.01712	1.58	1.4324%	4,273.70	73.18
i-Octanes	114.23	5.8433%	0.05843	6.67	6.0591%	0.00	0.00
n-Octane	114.23	0.0000%	0.00000	0.00	0.0000%	0.00	0.00
Ethylbenzene	106.17	0.5270%	0.00527	0.56	0.5079%	4,970.70	26.20
Xylenes	106.17	1.3299%	0.01330	1.41	1.2817%	4,957.40	65.93
i-Nonanes	128.26	4.3872%	0.04387	5.63	5.1080%	6,444.09	282.72
n-Nonane	128.26	0.0000%	0.00000	0.00	0.0000%	6,444.09	0.00
i-Decanes	142.29	45.1699%	0.45170	64.27	58.3439%	0.00	0.00
n-Decane	142.29	0.0000%	0.00000	0.00	0.0000%	0.00	0.00
Undecanes	156.31	0.0000%	0.00000	0.00	0.0000%	0.00	0.00
Dodecanes	170.33	0.0000%	0.00000	0.00	0.0000%	0.00	0.00
Tridecanes	184.36	0.0000%	0.00000	0.00	0.0000%	0.00	0.00
Tetradecanes Plus	184.36	0.0000%	0.00000	0.00	0.0000%	0.00	0.00
Totals		99.9732%	99.9732%	110.16	100.0000%		1,970.43

Note: Nonane heating value calculated from NOAA Cautionary Response Information sheet
There is no available information for a heating value for Decanes, Octanes, Carbon Dioxide, or Nitrogen

VOC Mol %	97.46%
HAP Mol %	8.10%
Gas Specific Gravity	3.80
LHV BTU Content	1,970.43

VOC Wt %	99.41%
HAP Wt %	6.73%





AIR POLLUTION TESTING, INC.

DENVER, SALT LAKE CITY

5530 Marshall Street
Arvada, Colorado 80002
Phone: 303-420-5949
Fax: 303-420-5920

EXTENDED GAS ANALYSIS

SAMPLE DATA

PROJECT NO..... LLTE6089
COMPANY NAME..... LT Environmental
SITE..... Callaway 3-33
UNIT ID..... Callaway 3-33
SAMPLED BY..... DW

SAMPLE ID..... Sales Gas
ANALYSIS DATE..... 7/19/2016
SAMPLE DATE..... 7/14/2016
CYLINDER NO..... GV-40
LAB ANALYST..... CB

FIELD DATA

SAMPLE PRESSURE..... 40 psig
AMBIENT PRESSURE..... 12.1 psi

SAMPLE TEMP..... 87 F
AMBIENT TEMP..... 75 F

COMMENTS:

LABORATORY DATA

COMPONENT	MOLE %	WT%	GPM
HYDROGEN SULFIDE.....	0.0000	0.0000	0.0000
CARBON DIOXIDE.....	0.5681	0.9283	0.0972
NITROGEN.....	11.5049	11.9666	1.2690
METHANE.....	53.1170	31.6393	9.0283
ETHANE.....	14.9130	16.6497	3.9986
PROPANE.....	11.7569	19.2491	3.2474
ISOBUTANE.....	1.5479	3.3405	0.5078
N-BUTANE.....	4.0093	8.6525	1.2673
ISOPENTANE.....	0.8555	2.2918	0.3137
N-PENTANE.....	0.8306	2.2250	0.3019
CYCLOPENTANE.....	0.0856	0.2228	0.0254
N-HEXANE.....	0.1065	0.3406	0.0439
CYCLOHEXANE.....	0.0188	0.0588	0.0064
OTHER HEXANES.....	0.3160	1.0112	0.1303
HEPTANES.....	0.0793	0.2950	0.0367
METHYLCYCLOHEXANE.....	0.0124	0.0452	0.0050
2,2,4 TRIMETHYLPENTANE.....	0.0110	0.0467	0.0055
BENZENE.....	0.0377	0.1095	0.0106
TOLUENE.....	0.0099	0.0338	0.0033
ETHYLBENZENE.....	0.0005	0.0019	0.0002
XYLENES.....	0.0049	0.0194	0.0019
C8+ HEAVIES.....	0.2023	0.8582	0.1039
SUBTOTAL	99.9881	99.9858	20.4043
OXYGEN/ARGON	0.0119	0.0142	0.0011
TOTAL	100	100	20.4053

BTU @

MOLECULAR WEIGHT.....	26.9326	NET DRY REAL	1268.2666 /scf
RELATIVE DENSITY (AIR=1).....	0.9299		
COMPRESSIBILITY FACTOR.....	0.9949	GROSS DRY REAL	1396.6796 /scf
		GROSS WET REAL	1372.9043 /scf

Mustang Creek Operating LLC
Callaway 3-33
Gas Composition Calculations
Site-Specific sample from the Callaway 3-33 facility, collected on 6/23/16

Component	Molecular Weight (lb/lb-mol)	Mole (Vol.) Percent (%)	Mole Frac.	Gas Weight (lb/lb-mol)	Weight Percent (%)	LHV BTU Content	
						Btu/scf	Btu/scf*Mole Frac
Nitrogen	28.013	11.5049%	0.11505	3.22	11.9647%	0.00	0.00
Methane	16.041	53.1170%	0.53117	8.52	31.6318%	909.40	483.05
Carbon Dioxide	44.01	0.5681%	0.00568	0.25	0.9282%	0.00	0.00
Hydrogen Sulfide	34.08	0.0000%	0.00000	0.00	0.0000%	586.80	0.00
Ethane	30.063	14.9130%	0.14913	4.48	16.6439%	1,618.70	241.40
Propane	44.092	11.7569%	0.11757	5.18	19.2447%	2,314.90	272.16
i-Butane	58.118	1.5479%	0.01548	0.90	3.3397%	3,000.40	46.44
n-Butane	58.118	4.0093%	0.04009	2.33	8.6504%	3,010.80	120.71
i-Pentane	72.114	0.8555%	0.00856	0.62	2.2903%	3,699.00	31.64
n-Pentane	72.114	0.8306%	0.00831	0.60	2.2237%	3,706.90	30.79
i-Hexanes	86.18	0.3160%	0.00316	0.27	1.0110%	4,392.70	13.88
n-Hexane	86.18	0.1065%	0.00107	0.09	0.3407%	4,404.10	4.69
Benzene	78.12	0.0377%	0.00038	0.03	0.1093%	3,591.10	1.35
Cyclohexane	84.16	0.1168%	0.00117	0.10	0.3649%	4,179.90	4.88
i-Heptanes	100.21	0.0793%	0.00079	0.08	0.2950%	5,100.30	4.04
n-Heptane	100.21	0.0000%	0.00000	0.00	0.0000%	5,100.30	0.00
Toluene	92.15	0.0099%	0.00010	0.01	0.0339%	4,273.70	0.42
i-Octanes	114.23	0.0000%	0.00000	0.00	0.0000%	0.00	0.00
n-Octane	114.23	0.2023%	0.00202	0.23	0.8579%	0.00	0.00
Ethylbenzene	106.17	0.0005%	0.00001	0.00	0.0020%	4,970.70	0.02
Xylenes	106.17	0.0049%	0.00005	0.01	0.0193%	4,957.40	0.24
i-Nonanes	128.26	0.0000%	0.00000	0.00	0.0000%	6,444.09	0.00
n-Nonane	128.26	0.0000%	0.00000	0.00	0.0000%	6,444.09	0.00
i-Decanes	142.29	0.0000%	0.00000	0.00	0.0000%	0.00	0.00
n-Decane	142.29	0.0000%	0.00000	0.00	0.0000%	0.00	0.00
Undecanes	156.31	0.0000%	0.00000	0.00	0.0000%	0.00	0.00
Dodecanes	170.33	0.0000%	0.00000	0.00	0.0000%	0.00	0.00
Tridecanes	184.36	0.0000%	0.00000	0.00	0.0000%	0.00	0.00
Tetradecanes Plus	184.36	0.0000%	0.00000	0.00	0.0000%	0.00	0.00
2,2,4 Trimethylpentane	114.23	0.0110%	0.00011	0.01	0.0466%	0.00	0.00
Helium/Oxygen/Argon	4.00	0.0119%	0.00012	0.00	0.0018%	0.00	0.00
Totals		100.0000%	100.0000%	26.94	100.0000%		1,255.74

Note: Nonane heating value calculated from NOAA Cautionary Response Information sheet

There is no available information for a heating value for Decanes, Octanes, Carbon Dioxide, or Nitrogen

VOC Mol %	19.89%	VOC Wt %	38.83%
HAP Mol %	0.17%	HAP Wt %	0.55%
Gas Specific Gravity	0.93		
LHV BTU Content	1,255.74		



ATTACHMENT E
AMBIENT AIR QUALITY ANALYSIS

**Mustang Creek Operating LLC – Callaway 3-33 Pad
Ambient Air Quality Analysis**

Air dispersion modeling for the Callaway 3-33 well is unnecessary because the facility emissions are less than the modeling thresholds found under Table 1 of the Colorado Modeling Guideline issued May 20, 2011.

Pollutant	Modeling Threshold (tons per year or TPY)	Callaway 3-33 Emissions (TPY)
NO _x	40	1.91
CO	100	4.13
PM ₁₀ /PM _{2.5}	15/5	0.03/0.03
SO _x	40	0.00



ATTACHMENT F
MODEL RUNS

Tank Losses Plant Schematic

Client Name: Mustang Creek Operating LLC

Job:

Location: Callaway 3-33 Pad

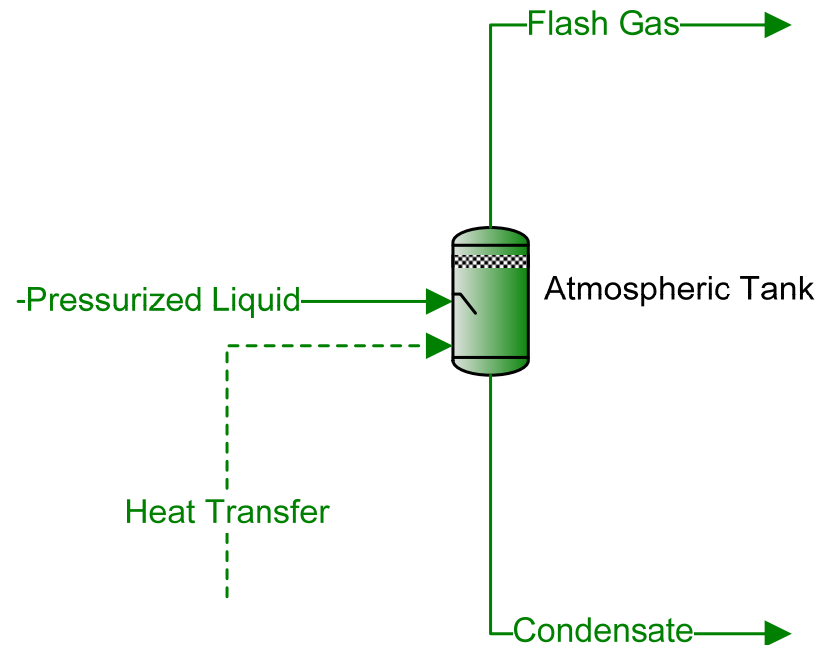
Flowsheet: Tank Losses

"Flash Gas" VOCs = 7.645 ton/yr

Annual tank loss calculations for "Pressurized Liquid".
Total working and breathing losses from the Vertical Cylinder are 5.416 ton/yr.
Flashing losses are 21.61 ton/yr.
Loading losses are 2.009 ton/yr of loaded liquid.
Vapor adjusted to insure mass balance

Working →

Tank-1



Process Streams Report All Streams

Tabulated by Total Phase

Client Name: Mustang Creek Operating LLC
Location: Callaway 3-33 Pad
Flowsheet: Tank Losses

Job:

Connections

	Condensate	Flash Gas	Pressurized Liquid	Working	
From Block	Atmospheric Tank	Atmospheric Tank	--	--	
To Block	--	--	Atmospheric Tank	--	

Stream Composition

	Condensate	Flash Gas	Pressurized Liquid	Working	
Mole Fraction	%	%	%	%	
Carbon Dioxide	0.0070808	0.604652	0.0267888 *	0.219761 *	
Nitrogen	0.000738393	0.565179	0.0193537 *	0.0235454 *	
Methane	0.0857592	20.9537	0.773984 *	2.65767 *	
Ethane	0.805161	28.5957	1.72169 *	27.3875 *	
Propane	3.52032	29.8063	4.38723 *	37.352 *	
i-Butane	1.23161	3.57555	1.30891 *	5.33458 *	
n-Butane	5.05499	9.7314	5.20922 *	15.4558 *	
i-Pentane	3.06056	2.00324	3.02569 *	3.58396 *	
n-Pentane	4.02059	1.8966	3.95054 *	3.48396 *	
Cyclopentane	0.600572	0.166066	0.586242 *	0.31921 *	
n-Hexane	3.1999	0.371497	3.10662 *	0.787841 *	
Cyclohexane	0.982259	0.0778972	0.952433 *	0.153632 *	
2-Methylpentane	6.2246	1.10428	6.05573 *	2.16894 *	
n-Heptane	6.99413	0.23249	6.77113 *	0.489103 *	
Methylcyclohexane	1.76851	0.0588029	1.71212 *	0.126616 *	
2,2,4-Trimethylpentane	0.210459	0.00753522	0.203767 *	0.0162398 *	
Benzene	1.25606	0.128703	1.21888 *	0.189124 *	
Toluene	1.76931	0.0437225	1.7124 *	0.0758483 *	
Ethylbenzene	0.544847	0.00372377	0.527 *	0.0077016 *	
p-Xylene	1.37498	0.00897235	1.32992 *	0.017392 *	
n-Octane	6.04073	0.053234	5.84326 *	0.122801 *	
n-Nonane	4.53646	0.0108546	4.3872 *	0.0268068 *	
C10+	46.7104	9.76188E-07	45.1699 *	3.00803E-06 *	

	Condensate	Flash Gas	Pressurized Liquid	Working	
Molar Flow	lbmol/h	lbmol/h	lbmol/h	lbmol/h	
Carbon Dioxide	0.00014116	0.000411105	0.000552265 *	5.85991E-05 *	
Nitrogen	1.47204E-05	0.000384267	0.000398987 *	6.27837E-06 *	
Methane	0.00170967	0.0142465	0.0159561 *	0.000708666 *	
Ethane	0.0160514	0.0194423	0.0354937 *	0.00730286 *	
Propane	0.0701798	0.0202654	0.0904452 *	0.00995988 *	
i-Butane	0.024553	0.00243103	0.026984 *	0.00142246 *	
n-Butane	0.100775	0.00661641	0.107391 *	0.00412129 *	
i-Pentane	0.0610143	0.00136201	0.0623763 *	0.000955661 *	
n-Pentane	0.080153	0.00128951	0.0814425 *	0.000928997 *	
Cyclopentane	0.0119728	0.000112909	0.0120857 *	8.51172E-05 *	
n-Hexane	0.0637921	0.000252582	0.0640447 *	0.000210077 *	
Cyclohexane	0.019582	5.29626E-05	0.0196349 *	4.09658E-05 *	
2-Methylpentane	0.124091	0.000750804	0.124842 *	0.000578346 *	
n-Heptane	0.139432	0.000158071	0.139591 *	0.000130419 *	
Methylcyclohexane	0.0352563	3.99803E-05	0.0352963 *	3.37621E-05 *	
2,2,4-Trimethylpentane	0.00419565	5.12322E-06	0.00420077 *	4.33035E-06 *	
Benzene	0.0250404	8.75056E-05	0.0251279 *	5.04299E-05 *	
Toluene	0.0352724	2.97271E-05	0.0353021 *	2.02249E-05 *	
Ethylbenzene	0.0108619	2.53181E-06	0.0108644 *	2.05363E-06 *	
p-Xylene	0.027411	6.10033E-06	0.0274171 *	4.63757E-06 *	
n-Octane	0.120426	3.6194E-05	0.120462 *	3.27449E-05 *	
n-Nonane	0.0904372	7.3801E-06	0.0904446 *	7.14801E-06 *	
C10+	0.931202	6.63713E-10	0.931202 *	8.02089E-10 *	

* User Specified Values

? Extrapolated or Approximate Values

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Process Streams Report

All Streams

Tabulated by Total Phase

Client Name: Mustang Creek Operating LLC

Job:

Location: Callaway 3-33 Pad

Flowsheet: Tank Losses

	Condensate	Flash Gas	Pressurized Liquid	Working	
Mass Fraction	%	%	%	%	
Carbon Dioxide	0.00183777	0.699213	0.00713533 *	0.208566 *	
Nitrogen	0.000121988	0.416015	0.00328129 *	0.0142239 *	
Methane	0.0081136	8.83259	0.0751482 *	0.91943 *	
Ethane	0.142779	22.5932	0.313322 *	17.759 *	
Propane	0.91546	34.5351	1.17085 *	35.5186 *	
i-Butane	0.422161	5.46063	0.460435 *	6.68635 *	
n-Butane	1.73271	14.8619	1.83244 *	19.3723 *	
i-Pentane	1.30224	3.79769	1.3212 *	5.57621 *	
n-Pentane	1.71073	3.59553	1.72504 *	5.42062 *	
Cyclopentane	0.248399	0.306028	0.248836 *	0.482775 *	
n-Hexane	1.62623	0.841193	1.62027 *	1.46409 *	
Cyclohexane	0.487519	0.172259	0.485124 *	0.278824 *	
2-Methylpentane	3.16342	2.50046	3.15838 *	4.03067 *	
n-Heptane	4.13306	0.612122	4.10631 *	1.05687 *	
Methylcyclohexane	1.02404	0.151707	1.01742 *	0.268093 *	
2,2,4-Trimethylpentane	0.141777	0.0226166	0.140872 *	0.040004 *	
Benzene	0.578615	0.264158	0.576227 *	0.318575 *	
Toluene	0.961406	0.105853	0.954907 *	0.150707 *	
Ethylbenzene	0.341128	0.0103878	0.338616 *	0.0176323 *	
p-Xylene	0.860872	0.0250291	0.854523 *	0.0398178 *	
n-Octane	4.06936	0.159779	4.03966 *	0.302499 *	
n-Nonane	3.43126	0.0365803	3.40547 *	0.0741422 *	
C10+	72.6968	6.76909E-06	72.1445 *	1.71186E-05 *	

	Condensate	Flash Gas	Pressurized Liquid	Working	
Mass Flow	lb/h	lb/h	lb/h	lb/h	
Carbon Dioxide	0.0062124	0.0180925	0.0243049 *	0.00257892 *	
Nitrogen	0.000412367	0.0107646	0.011177 *	0.000175879 *	
Methane	0.0274272	0.228548	0.255975 *	0.0113688 *	
Ethane	0.482651	0.584611	1.06726 *	0.21959 *	
Propane	3.09462	0.893614	3.98824 *	0.439187 *	
i-Butane	1.42707	0.141297	1.56837 *	0.0826767 *	
n-Butane	5.85724	0.38456	6.2418 *	0.239538 *	
i-Pentane	4.4021	0.0982674	4.50037 *	0.0689498 *	
n-Pentane	5.78294	0.0930363	5.87598 *	0.067026 *	
Cyclopentane	0.839687	0.00791864	0.847606 *	0.00596952 *	
n-Hexane	5.49731	0.0217663	5.51908 *	0.0181035 *	
Cyclohexane	1.64801	0.0044573	1.65247 *	0.00344766 *	
2-Methylpentane	10.6936	0.0647008	10.7583 *	0.0498392 *	
n-Heptane	13.9714	0.015839	13.9872 *	0.0130683 *	
Methylcyclohexane	3.46168	0.00392551	3.4656 *	0.00331497 *	
2,2,4-Trimethylpentane	0.479262	0.000585218	0.479848 *	0.000494649 *	
Benzene	1.95595	0.00683523	1.96279 *	0.00393918 *	
Toluene	3.24994	0.00273901	3.25268 *	0.00186349 *	
Ethylbenzene	1.15315	0.000268789	1.15342 *	0.000218024 *	
p-Xylene	2.91009	0.000647641	2.91074 *	0.000492347 *	
n-Octane	13.7561	0.00413438	13.7602 *	0.0037404 *	
n-Nonane	11.599	0.000946535	11.6 *	0.000916769 *	
C10+	245.744	1.75154E-07	245.744 *	2.11671E-07 *	

Stream Properties

Property	Units	Condensate	Flash Gas	Pressurized Liquid	Working	
Temperature	°F	46.5 *	46.5	86 *	72.9198 *	
Pressure	psig	-2.65595 *	-2.65595	37 *	2.31787	
Mole Fraction Vapor	%	0	100	0.0460877	100 *	
Mole Fraction Light Liquid	%	100	0	99.9539	0	

* User Specified Values

? Extrapolated or Approximate Values

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Process Streams Report All Streams Tabulated by Total Phase						
Client Name:	Mustang Creek Operating LLC				Job:	
Location:	Callaway 3-33 Pad					
Flowsheet:	Tank Losses					
Stream Properties						
Property	Units	Condensate	Flash Gas	Pressurized Liquid	Working	
Mole Fraction Heavy Liquid	%	0	0	0	0	
Molecular Weight	lb/lbmol	169.566	38.0577	165.228	46.3717	
Mass Density	lb/ft^3	51.1901	0.0853556	49.2062	0.141056	
Molar Flow	lbmol/h	1.99357	0.0679903	2.06156	0.026665	
Mass Flow	lb/h	338.04	2.58756	340.628	1.2365 *	
Vapor Volumetric Flow	ft^3/h	6.60362	30.315	6.92246	8.76602	
Liquid Volumetric Flow	gpm	0.823308	3.77953	0.86306	1.09291	
Std Vapor Volumetric Flow	MMSCFD	0.0181566	0.00061923	0.0187759	0.000242854	
Std Liquid Volumetric Flow	sgpm	0.835917 *	0.0112144	0.847131	0.00489846	
Compressibility		0.00734206	0.988274	0.0296434	0.978605	
Specific Gravity		0.820762	1.31403		1.60109	
API Gravity		42.1472				
Enthalpy	Btu/h	-279619	-2941.99	-276795	-1253.47	
Mass Enthalpy	Btu/lb	-827.177	-1136.98	-812.602	-1013.73	
Mass Cp	Btu/(lb*°F)	0.44291	0.397626	0.467135	0.402931	
Ideal Gas CpCv Ratio		1.03544	1.15215	1.03386	1.12019	
Dynamic Viscosity	cP	2.18892	0.00839321		0.00817757	
Kinematic Viscosity	cSt	2.66946	6.13869		3.6192	
Thermal Conductivity	Btu/(h*ft*°F)	0.0730889 ?	0.0108949		0.0101792	
Surface Tension	lbf/ft	0.00197664 ?				
Net Ideal Gas Heating Value	Btu/ft^3	8308.52	1988.27	8100.07	2419.24	
Net Liquid Heating Value	Btu/lb	18439.9	19682.8	18449.3	19641	
Gross Ideal Gas Heating Value	Btu/ft^3	8868.23	2165.25	8647.17	2627.27	
Gross Liquid Heating Value	Btu/lb	19692.5	21447.6	19705.8	21343.5	
Remarks						

ATTACHMENT G
SUPPORTING DOCUMENTATION