JAY-BEE OIL & GAS, INC.

APPLICATION FOR MODIFICATION OF GENERAL PERMIT

Moe Well Pad Production Facility
Tyler County, West Virginia

98 Vanadium Road
Bridgeville, PA 15017
(412) 221-1100

APPLICATION FOR G70-D GENERAL PERMIT

Jay-Bee Oil & Gas, Inc.

Moe Well Pad Production Facility

Tyler County, West Virginia

Table of Contents

SECTION I

Application Form

dep	**west virginia** department of environmental protection	Division of Air Quality 601 57th Street SE Charleston, WV 25 4 Phone (304) 926-0475 Fax (304) 926-0479 www.dep.wv.gov

G70-D GENERAL PERMIT REGISTRATION APPLICATION

PREVENTION AND CONTROL OF AIR POLLUTION IN REGARD TO THE CONSTRUCTION, MODIFICATION, RELOCATION, ADMINISTRATIVE UPDATE AND OPERATION OF NATURAL GAS PRODUCTION FACILITIES LOCATED AT THE WELL SITE

☐CONSTRUCTION
☒MODIFICATION
☐RELOCATION
☐CLASS I ADMINISTRATIVE UPDATE
☐CLASS II ADMINISTRATIVE UPDATE

SECTION 1. GENERAL INFORMATION

Name of Applicant (as registered with the WV Secretary of State's Office): **Jay-Bee Oil & Gas, Inc.**

Federal Employer ID No. (FEIN): **55-073-8862**

Applicant's Mailing Address: **3570 Shields Hill Rd**

City: Cairo	State: WV	ZIP Code: 26337

Facility Name: **Moe Well Pad Production Facility**

Operating Site Physical Address: Off Klondike Acres Rd
If none available, list road, city or town and zip of facility.

City: Middlebourne	Zip Code: 26149	County: Tyler

Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits):
Latitude: 39.46791
Longitude: -80.88719

SIC Code: 1311 NAICS Code: 211111	SIC Code: 1311 NAICS Code: 211111

CERTIFICATION OF INFORMATION

This G70-D General Permit Registration Application shall be signed below by a Responsible Official. A Responsible Official is a President, Vice President, Secretary, Treasurer, General Partner, General Manager, a member of the Board of Directors, or Owner, depending on business structure. A business may certify an Authorized Representative who shall have authority to bind the Corporation, Partnership, Limited Liability Company, Association, Joint Venture or Sole Proprietorship. Required records of daily throughput, hours of operation and maintenance, general correspondence, compliance certifications and all required notifications must be signed by a Responsible Official or an Authorized Representative. If a business wishes to certify an Authorized Representative, the official agreement below shall be checked off and the appropriate names and signatures entered. **Any administratively incomplete or improperly signed or unsigned G70-D Registration Application will be returned to the applicant. Furthermore, if the G70-D forms are not utilized, the application will be returned to the applicant. No substitution of forms is allowed.**

I hereby certify that is an Authorized Representative and in that capacity shall represent the interest of the business (e.g., Corporation, Partnership, Limited Liability Company, Association Joint Venture or Sole Proprietorship) and may obligate and legally bind the business. If the business changes its Authorized Representative, a Responsible Official shall notify the Director of the Division of Air Quality immediately.

I hereby certify that all information contained in this G70-D General Permit Registration Application and any supporting documents appended hereto is, to the best of my knowledge, true, accurate and complete, and that all reasonable efforts have been made to provide the most comprehensive information possible.

Responsible Official Signature: _____
Name and Title: **Shane Dowell, Office Manager** Phone: **304-628-3119** Fax:
Email: **sdowell@jaybeeoil.com** Date:

If applicable:
Authorized Representative Signature: _____
Name and Title: Phone: Fax:
Email: Date:

If applicable:
Environmental Contact
Name and Title: Phone: Fax:
Email: Date:

OPERATING SITE INFORMATION
Briefly describe the proposed new operation and/or any change(s) to the facility: Jay-Bee is seeking approval for installation of a compressor engine. Jay-Bee is also seeking to replace the permitted 40 MMSCFD Dehydration Unit with a 20 MMSCFD Dehydration Unit. This change will result in a modification to EC-2 emissions. This is enclosed combustor the new dehydration unit will be routed to. However, there will be no physical changes to EC-2. There are no other proposed changes to the facility at this time.
Directions to the facility: From Middlebourne, proceed southwest on State Route 18 (Main Street) out of town. Turn right onto Bridgeway Rd. Turn left onto Wick Rd and follow for approximately 2.0 miles. Turn left onto Klondike Acres Rd and follow for approximately 2.5 miles to well pad entrance.

ATTACHMENTS AND SUPPORTING DOCUMENTS	
I have enclosed the following required documents:	
Check payable to WVDEP – Division of Air Quality with the appropriate application fee (per 45CSR13 and 45CSR22). ☒ Check attached to front of application. ☐ I wish to pay by electronic transfer. Contact for payment (incl. name and email address): ☐ I wish to pay by credit card. Contact for payment (incl. name and email address): ☒$500 (Construction, Modification, and Relocation) ☐$300 (Class II Administrative Update) ☒$1,000 NSPS fee for 40 CFR60, Subpart IIII, JJJJ, OOOO and/or OOOOa [1] ☒$2,500 NESHAP fee for 40 CFR63, Subpart ZZZZ and/or HH [2] [1] Only one NSPS fee will apply. [2] Only one NESHAP fee will apply. The Subpart ZZZZ NESHAP fee will be waived for new engines that satisfy requirements by complying with NSPS, Subparts IIII and/or JJJJ. *NSPS and NESHAP fees apply to new construction or if the source is being modified.*	
☒ Responsible Official or Authorized Representative Signature (if applicable)	
☒ Single Source Determination Form **(must be completed)** – Attachment A	
☐ Siting Criteria Waiver (if applicable) – Attachment B	☒ Current Business Certificate – Attachment C
☒ Process Flow Diagram – Attachment D	☒ Process Description – Attachment E
☒ Plot Plan – Attachment F	☒ Area Map – Attachment G
☒ G70-D Section Applicability Form – Attachment H	☒ Emission Units/ERD Table – Attachment I
☒ Fugitive Emissions Summary Sheet – Attachment J	
☒ Gas Well Affected Facility Data Sheet (if applicable) – Attachment K	
☐ Storage Vessel(s) Data Sheet (include gas sample data, USEPA Tanks, simulation software (e.g. ProMax, E&P Tanks, HYSYS, etc.), etc. where applicable) – Attachment L	
☐ Natural Gas Fired Fuel Burning Unit(s) Data Sheet (GPUs, Heater Treaters, In-Line Heaters if applicable) – Attachment M	
☒ Internal Combustion Engine Data Sheet(s) (include manufacturer performance data sheet(s) if applicable) – Attachment N	
☐ Tanker Truck/Rail Car Loading Data Sheet (if applicable) – Attachment O	
☒ Glycol Dehydration Unit Data Sheet(s) (include wet gas analysis, GRI- GLYCalc™ input and output reports and information on reboiler if applicable) – Attachment P	
☒ Pneumatic Controllers Data Sheet – Attachment Q	
☒ Pneumatic Pump Data Sheet – Attachment R	
☒ Air Pollution Control Device/Emission Reduction Device(s) Sheet(s) (include manufacturer performance data sheet(s) if applicable) – Attachment S	
☒ Emission Calculations (please be specific and include all calculation methodologies used) – Attachment T	
☒ Facility-wide Emission Summary Sheet(s) – Attachment U	
☒ Class I Legal Advertisement – Attachment V	
☒ One (1) paper copy and two (2) copies of CD or DVD with pdf copy of application and attachments	

All attachments must be identified by name, divided into sections, and submitted in order.

SECTION II

Attachments

ATTACHMENT A - SINGLE SOURCE DETERMINATION FORM

Classifying multiple facilities as one "stationary source" under 45CSR13, 45CSR14, and 45CSR19 is based on the definition of Building, structure, facility, or installation as given in §45-14-2.13 and §45-19-2.12. The definition states:

"Building, Structure, Facility, or Installation" means all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control). Pollutant-emitting activities are a part of the same industrial grouping if they belong to the same "Major Group" (i.e., which have the same two (2)-digit code) as described in the Standard Industrial Classification Manual, 1987 (United States Government Printing Office stock number GPO 1987 0-185-718:QL 3).

The Source Determination Rule for the oil and gas industry was published in the Federal Register on June 3, 2016 and will become effective on August 2, 2016. EPA defined the term "adjacent" and stated that equipment and activities in the oil and gas sector that are under common control will be considered part of the same source if they are located on the same site or on sites that share equipment and are within ¼ mile of each other.

Is there equipment and activities in the same industrial grouping (defined by SIC code)?
Yes ☐ No ☒

Is there equipment and activities under the control of the same person/people?
Yes ☐ No ☒

Is there equipment and activities located on the same site or on sites that share equipment and are within ¼ mile of each other?
Yes ☐ No ☒

The proposed modification to this facility will not change the previous single source determination. Additionally, there have been no other Jay-Bee facilities installed in proximity to this facility since that previous determination.

ATTACHMENT C – CURRENT BUSINESS CERTIFICATE

If the applicant is a resident of West Virginia, the applicant should provide a copy of the current Business Registration Certificate issued to them from the West Virginia Secretary of State's Office. If the applicant is not a resident of the State of West Virginia, the registrant should provide a copy of the Certificate of Authority/Authority of LLC/Registration. This information is required for all sources to operate a business in West Virginia regardless of whether it is a construction, modification, or administrative update.

If you are a new business to West Virginia and have applied to the West Virginia Secretary of State's Office for a business license, please include a copy of your application.

Please note: Under the West Virginia Bureau of Employment Programs, 96CSR1, the DAQ may not grant, issue, or renew approval of any permit, general permit registration, or Certificate to Operate to any employing unit whose account is in default with the Bureau of Employment Programs Unemployment Compensation Division.

Attached Current WV Business Certificate

WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION
CERTIFICATE

ISSUED TO:
JAY-BEE OIL & GAS INC
RR 1 BOX 5
CAIRO, WV 26337-9701

BUSINESS REGISTRATION ACCOUNT NUMBER: **1043-4424**

This certificate is issued on: 06/11/2010

This certificate is issued by
the West Virginia State Tax Commissioner
in accordance with W.Va. Code s. 11-12.

The person or organization identified on this certificate is registered to conduct business in the State of West Virginia at the location above.

This certificate is not transferrable and must be displayed at the location for which issued.

This certificate shall be permanent until cessation of the business for which the certificate of registration was granted or until it is suspended, revoked, or cancelled by the Tax Commissioner.

Change in name or change of location shall be considered a cessation of the business and a new certificate shall be required.

TRAVELING/STREET VENDORS: Must carry a copy of this certificate in every vehicle operated by them.
CONTRACTORS, DRILLING OPERATORS, TIMBER/LOGGING OPERATIONS: Must have a copy of this certificate displayed at every job site within West Virginia.

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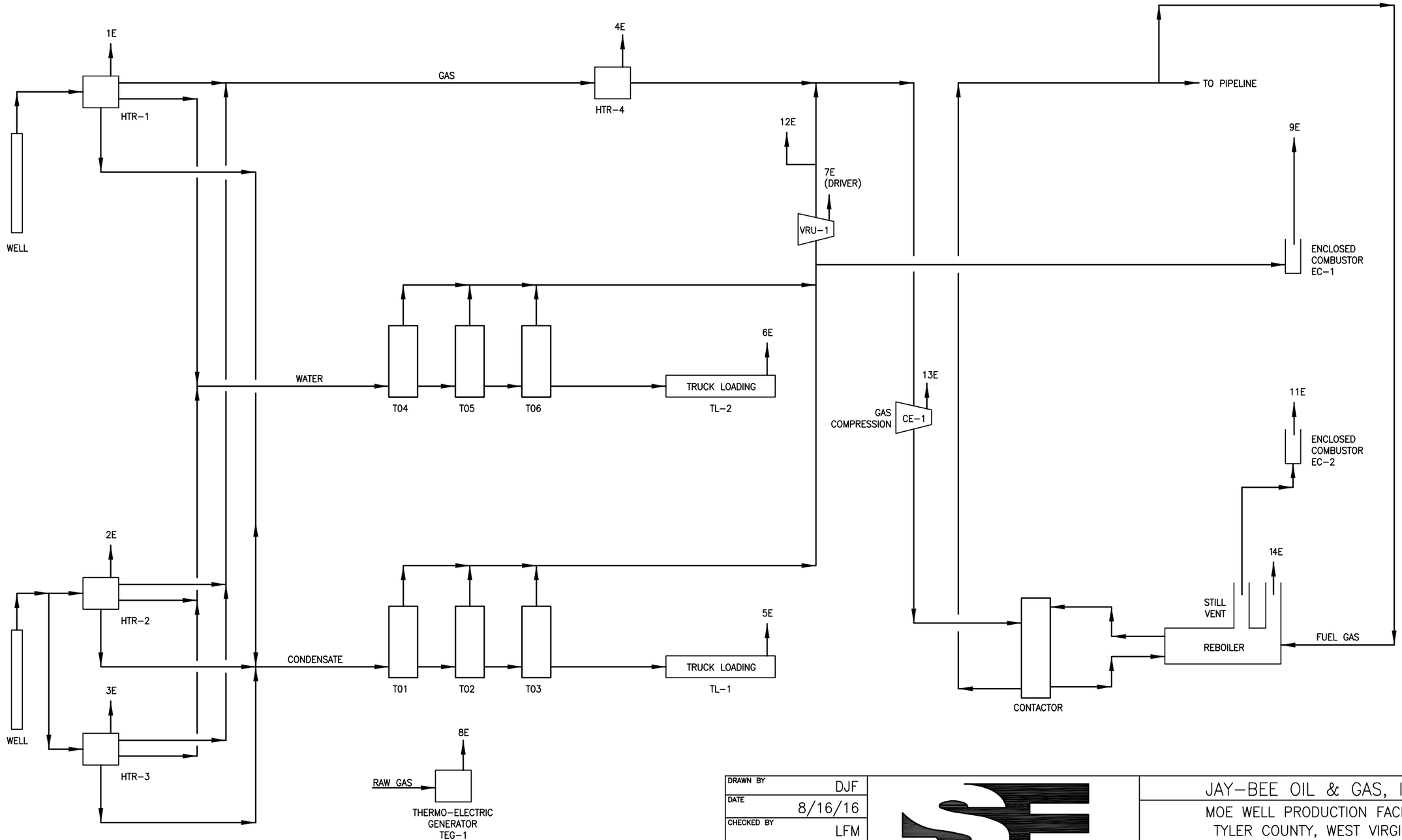
ATTACHMENT D – PROCESS FLOW DIAGRAM

Provide a diagram or schematic that supplements the process description of the operation. The process flow diagram must show all sources, components or facets of the operation in an understandable line sequence of operation. The process flow diagram should include the emission unit ID numbers, the pollution control device ID numbers, and the emission point ID numbers consistent with references in other attachments of the application. For a proposed modification, clearly identify the process areas, emission units, emission points, and/or control devices that will be modified, and specify the nature and extent of the modification.

Use the following guidelines to ensure a complete process flow diagram:

- The process flow diagram shall logically follow the entire process from beginning to end.
- Identify each emission source and air pollution control device with proper and consistent emission unit identification numbers, emission point identification numbers, and control device identification numbers.
- The process flow lines may appear different for clarity. For example, dotted lines may be used for vapor flow and solid lines used for liquid flow and arrows for direction of flow.
- The process flow lines may be color coded. For example: new or modified equipment may be red; old or existing equipment may be blue; different stages of preparation such as raw material may be green; and, finished product or refuse, another color.



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DRAWING SCALE	N.T.S.

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JAY-BEE OIL & GAS, INC.

MOE WELL PRODUCTION FACILITY
TYLER COUNTY, WEST VIRGINIA
PROCESS FLOW DIAGRAM

DRAWING NAME: FIGURE 3

REV. 2

ATTACHMENT E – PROCESS DESCRIPTION

Provide a detailed written description of the operation for which the applicant is seeking a permit. The process description is used in conjunction with the process flow diagram to provide the reviewing engineer a complete understanding of the activity at the operation. Describe in detail and order the complete process operation.

Use the following guidelines to ensure a complete Process Description:

- The process flow diagram should be prepared first and used as a guide when preparing the process description. The written description shall follow the logical order of the process flow diagram.
- All emission sources, emission points, and air pollution control devices must be included in the process description.
- When modifications are proposed, describe the modifications and the effect the changes will have on the emission sources, emission points, control devices and the potential emissions.
- Proper emission source ID numbers must be used consistently in the process description, the process flow diagram, the emissions calculations, and the emissions summary information provided.
- Include any additional information that may facilitate the reviewers understanding of the process operation.

The process description is required for all sources regardless of whether it is a construction, modification, or administrative update.

Jay-Bee Oil & Gas, Incorporated
Moe Well Pad Production Facility
Attachment E
Process Description

Jay-Bee Oil & Gas, Inc. currently operates the Moe Well Pad Production Facility under a G-70C permit, permit number G70-C216.

Proposed Changes

Jay-Bee is seeking approval for installation of a compressor engine. Jay-Bee is also seeking to replace the permitted 40 MMSCFD Dehydration Unit with a 20 MMSCFD Dehydration Unit. Gas flow through this facility does not warrant the larger unit. This change will result in a modification to EC-2 emissions. This is enclosed combustor the new dehydration unit will be routed to. However, there will be no physical changes to EC-2. There are no other proposed changes to the facility at this time.

The proposed dehydration unit will generate emissions from the still vent and re-boiler. There will be no flash tank. Vapors from the still vent will be comprised of water and various low molecular weight hydrocarbons. Still vent vapors will be routed to the permitted enclosed combustor, EC-2. A capture and control efficiency of 98% is being claimed for the combustor. Any water condensing in the still vent column will be routed to the wastewater tanks.

Current Operations

Currently, Natural gas and Produced Fluids (condensate and water) are received from two wells and passed through Gas Processing Units (one per Marcellus well and two per Utica well) to avoid ice formation during subsequent pressure drops. These materials pass through a three-way separator where gas, condensate and water are separated. All gas fired equipment use natural gas produced at the site as fuel. The Facility will then compress (proposed modification) and then dehydrate the gas. The gas is then injected into a gathering pipeline owned and operated by others.

Both Condensate and Produced Water are accumulated in six (6) 210 BBL tanks (three for Condensate and three for Produced Water), pending truck transportation by others. The Condensate is transported to a regional processing facility and the Produced Water is transported to a regional disposal facility. Flash, working and breathing losses from these tanks is routed to a Vapor Recovery Unit (VRU) with the captured vapors routed back to the raw gas discharge line. An enclosed combustor is utilized as a backup control device for times when the VRU is not available, and is also utilized if a large slug of condensate production generates flash gas in excess of the capacity of the VRU. A capture and control efficiency of 98% is being claimed for this overall combination of controls.

A Thermo-electric generator to meet the minor electric demands for various monitoring and data tracking equipment has also been installed at this facility.

In summary, upon approval of this application, emission sources at this facility will include the following:

- Three Gas Processing Units (GPUs), each with a 1.5 MMBTU/hr heater (Existing).
- One Line Heater (Existing)
- Condensate Truck Loading (Existing)
- Produced Water Truck Loading (Existing)
- One Vapor Recovery Unit (VRU) with driver engine (Existing), controlling emissions from T01-T06.

- One Thermo-electric Generator (Existing)
- Backup Enclosed Combustor for VRU (Existing)
- Three Produced Water Tanks (Existing)
- Three Condensate Tanks (Existing)
- Dehydration Unit (Source 10E – reboiler vent and 11E – still vent) **– REMOVE SOURCE**
- Enclosed Combustor for control of still vent (Source 11E) **– MODIFED SOURCE**
- Un-captured/un-controlled emissions associated with VRU (Existing)
- One Caterpillar G3516BLE compressor engine (Source 13E) **– NEW SOURCE**
- Dehydration Unit (Source 14E – reboiler vent and 11E – still vent) **– NEW SOURCE**

ATTACHMENT F – PLOT PLAN

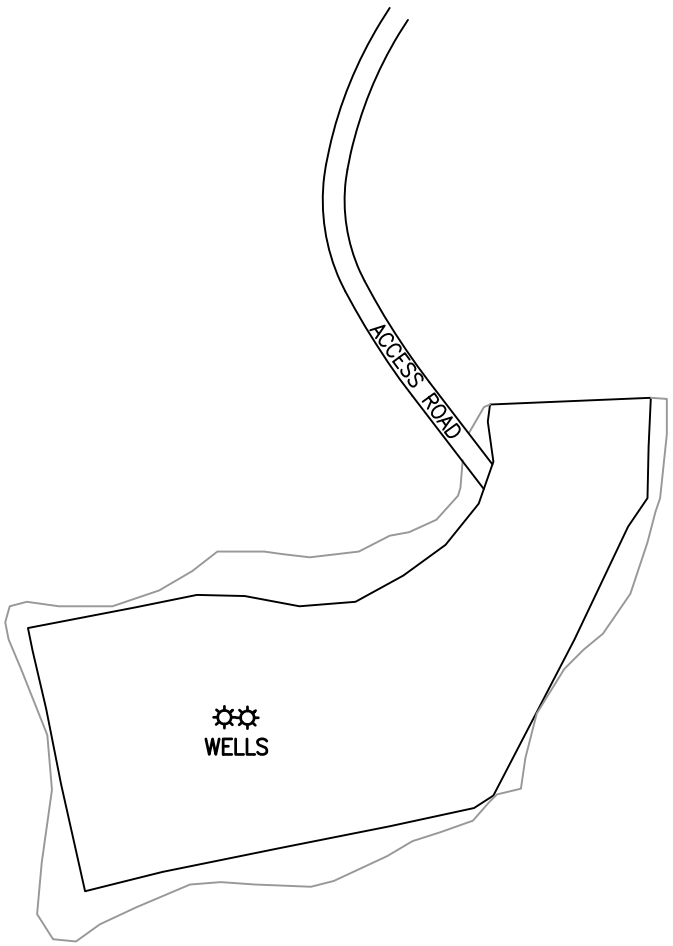
Provide an accurately scaled and detailed Plot Plan showing the locations of all emission units, emission points, and air pollution control devices. Show all emission units, affected facilities, enclosures, buildings and plant entrances and exits from the nearest public road(s) as appropriate. Note height, width and length of proposed or existing buildings and structures.

A scale between 1"=10' and 1"=200' should be used with the determining factor being the level of detail necessary to show operation or plant areas, affected facilities, emission unit sources, transfer points, etc. An overall small scale plot plan (e.g., 1"=300') should be submitted in addition to larger scale plot plans for process or activity areas (e.g., 1"=50') if the plant is too large to allow adequate detail on a single plot plan. Process or activity areas may be grouped for the enlargements as long as sufficient detail is shown.

Use the following guidelines to ensure a complete Plot Plan:

- Facility name
- Company name
- Company facility ID number (for existing facilities)
- Plot scale, north arrow, date drawn, and submittal date.
- Facility boundary lines
- Base elevation
- Lat/Long reference coordinates from the area map and corresponding reference point elevation
- Location of all point sources labeled with proper and consistent source identification numbers

This information is required for all sources regardless of whether it is a construction, modification, or administrative update.



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JAY-BEE OIL & GAS, INC.

MOE WELL PRODUCTION FACILITY
TYLER COUNTY, WEST VIRGINIA
SITE LAYOUT PLAN

DRAWING NAME	REV.
FIGURE 2	0

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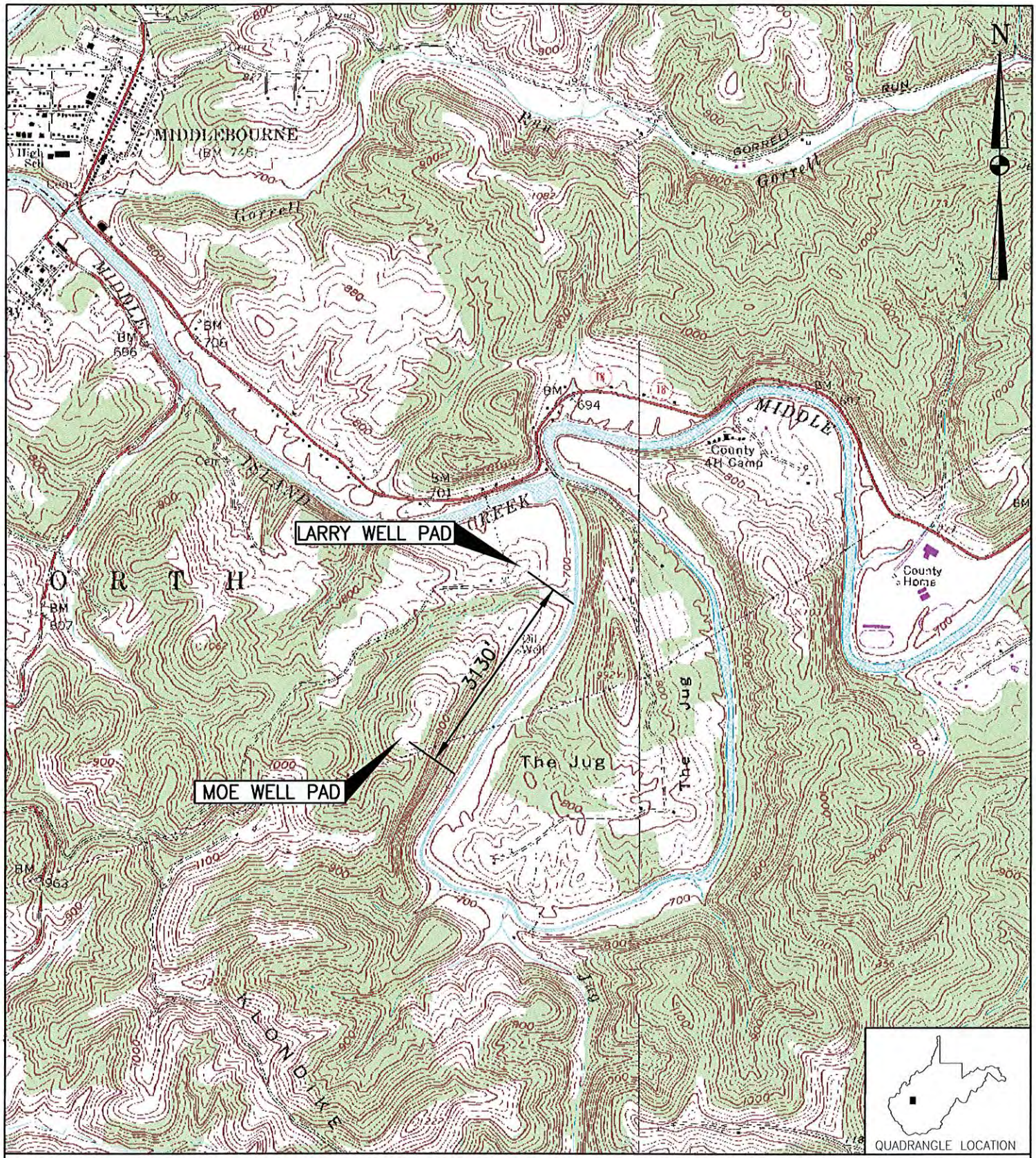
ATTACHMENT G – AREA MAP

Provide an Area Map showing the current or proposed location of the operation. On this map, identify plant or operation property lines, access roads and any adjacent dwelling, business, public building, school, church, cemetery, community or institutional building or public park within a 300’ boundary circle of the collective emission units.

Please provide a 300’ boundary circle on the map surrounding the proposed emission units collectively.

This information is required for all sources regardless of whether it is a construction, modification, or administrative update.



REFERENCE: USGS 7.5' QUADRANGLE MAP OF: MIDDLEBOURNE, WEST VIRGINIA; DATED 1960, PHOTOREVISED 1976.

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JAY-BEE OIL & GAS, INC.

LARRY & MOE WELL PADS
TYLER COUNTY, WEST VIRGINIA
SITE LOCATION MAP

DRAWING NO.	REV.
FIGURE 1	0

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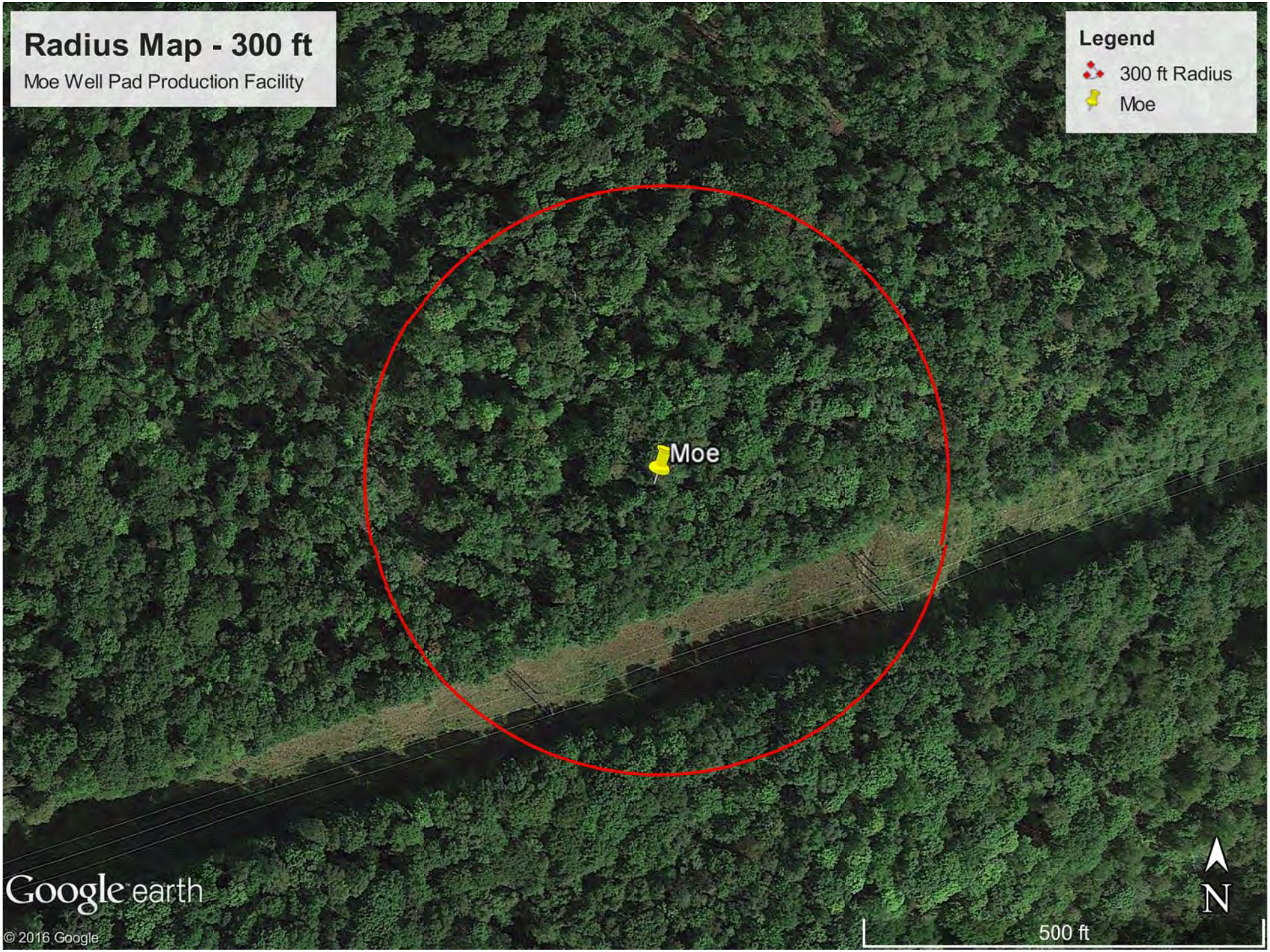

Radius Map - 300 ft
Moe Well Pad Production Facility
Legend
300 ft Radius
Moe
Moe
Google earth
© 2016 Google
N
500 ft

ATTACHMENT H – G70-D SECTION APPLICABILITY FORM

General Permit G70-D Registration
Section Applicability Form

General Permit G70-D was developed to allow qualified applicants to seek registration for a variety of sources. These sources include gas well affected facilities, storage vessels, gas production units, in-line heaters, heater treaters, glycol dehydration units and associated reboilers, pneumatic controllers, pneumatic pumps, reciprocating internal combustion engines (RICEs), tank truck/rail car loading, fugitive emissions, completion combustion devices, flares, enclosed combustion devices, and vapor recovery systems. All registered facilities will be subject to Sections 1.0, 2.0, 3.0, and 4.0.

General Permit G70-D allows the registrant to choose which sections of the permit they are seeking registration under. Therefore, please mark which additional sections that you are applying for registration under. If the applicant is seeking registration under multiple sections, please select all that apply. Please keep in mind, that if this registration is approved, the issued registration will state which sections will apply to your affected facility.

GENERAL PERMIT G70-D APPLICABLE SECTIONS	
☒Section 5.0	Gas and Oil Well Affected Facility (NSPS, Subpart OOOO/OOOOa)
☒Section 6.0	Storage Vessels Containing Condensate and/or Produced Water[1]
☐Section 7.0	Storage Vessel Affected Facility (NSPS, Subpart OOOO/OOOOa)
☒Section 8.0	Control Devices and Emission Reduction Devices not subject to NSPS Subpart OOOO/OOOOa and/or NESHAP Subpart HH
☒Section 9.0	Small Heaters and Reboilers not subject to 40CFR60 Subpart Dc
☐Section 10.0	Pneumatic Controllers Affected Facility (NSPS, Subpart OOOO/OOOOa)
☐Section 11.0	Pneumatic Pump Affected Facility (NSPS, Subpart OOOOa)
☒Section 12.0	Fugitive Emissions GHG and VOC Standards (NSPS, Subpart OOOOa)
☒Section 13.0	Reciprocating Internal Combustion Engines, Generator Engines
☒Section 14.0	Tanker Truck/Rail Car Loading[2]
☒Section 15.0	Glycol Dehydration Units[3]

1 *Applicants that are subject to Section 6 may also be subject to Section 7 if the applicant is subject to the NSPS, Subparts OOOO or OOOOa control requirements or the applicable control device requirements of Section 8.*

2 *Applicants that are subject to Section 14 may also be subject to control device and emission reduction device requirements of Section 8.*

3 *Applicants that are subject to Section 15 may also be subject to the requirements of Section 9 (reboilers). Applicants that are subject to Section 15 may also be subject to control device and emission reduction device requirements of Section 8.*

ATTACHMENT I – EMISSION UNITS / EMISSION REDUCTION DEVICES (ERD) TABLE

Include ALL emission units and air pollution control devices/ERDs that will be part of this permit application review. Do not include fugitive emission sources in this table. Deminimis storage tanks shall be listed in the Attachment L table. This information is required for all sources regardless of whether it is a construction, modification, or administrative update.

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed	Manufac. Date[3]	Design Capacity	Type[4] and Date of Change	Control Device(s)[5]	ERD(s)[6]
HTR-1	1E	Gas Processing Unit	2016		1.5 MMBTU/hr	Existing	None	None
HTR-2	2E	Gas Processing Unit	2016		1.5 MMBTU/hr	Existing	None	None
HTR-3	3E	Gas Processing Unit	2016		1.5 MMBTU/hr	Existing	None	None
HTR-4	4E	Line Heater	2016		0.5 MMBTU/hr	Existing	None	None
TL-1	5E	Condensate Truck Loading	2016		30,000 BBL/yr	Existing	None	None
TL-2	6E	Produced Water Truck Loading	2016		63,600 BBL/yr	Existing	None	None
VRU-1	7E	VRU Driver	2016	3/19/2012	84 HP	Existing	1C	None
TEG-1	8E	Thermoelectric Generator	2016		4.4 KW/hr	Existing	None	None
EC-1	9E	Enclosed Combustor	2016		10.0 MMBTU/hr	Existing	N/A	None
T01	7E/9E	Condensate Tank	2016		210 BBL	Existing	EC-1	VRU-1
T02	7E/9E	Condensate Tank	2016		210 BBL	Existing	EC-1	VRU-1
T03	7E/9E	Condensate Tank	2016		210 BBL	Existing	EC-1	VRU-1
T04	7E/9E	Produce Water Tank	2016		210 BBL	Existing	EC-1	VRU-1
T05	7E/9E	Produced Water Tank	2016		210 BBL	Existing	EC-1	VRU-1
T06	7E/9E	Produced Water Tank	2016		210 BBL	Existing	EC-1	VRU-1
RBV-1	10E	Dehydration Unit Re-boiler Vent	2016		0.500 MMBTU/hr	Removal	None	None
RSV-1	11E	Dehydration Unit Still Vent	2016		40 MMSCFD	Removal	EC-2	None
EC-2	11E	Enclosed Combustor	2016		10.0 MMBTU/hr	Modify	None	None
T01-T06	12E	Un-captured/Un-controlled VRU-1 Emissions	2016			Existing	None	None
CE-1	13E	Compressor Engine	Pending Approval	3/21/2012	1,380 HP	New	2C	None
RBV-2	14E	Dehydration Unit Re-boiler Vent	2016		0.200 MMBTU/hr	New	None	None
RSV-2	11E	Dehydration Unit Still Vent	2016		20 MMSCFD	New	EC-2	None

[1] For Emission Units (or Sources) use the following numbering system:1S, 2S, 3S,... or other appropriate designation.
[2] For Emission Points use the following numbering system:1E, 2E, 3E, ... or other appropriate designation.
[3] When required by rule
[4] New, modification, removal, existing
[5] For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.
[6] For ERDs use the following numbering system: 1D, 2D, 3D,... or other appropriate designation.

ATTACHMENT J – FUGITIVE EMISSIONS SUMMARY SHEET

Sources of fugitive emissions may include loading operations, equipment leaks, blowdown emissions, etc.

Source/Equipment:

Leak Detection Method Used	☒ Audible, visual, and olfactory (AVO) inspections	☐ Infrared (FLIR) cameras	☐ Other (please describe)	☐ None required

Component Type	Closed Vent System	Count	Source of Leak Factors (EPA, other (specify))	Stream type (gas, liquid, etc.)	Estimated Emissions (tpy)		
					VOC	HAP	GHG (methane, CO_2e)
Pumps	☐ Yes ☒ No	1	API	☒ Gas ☐ Liquid ☐ Both	<0.01	<0.01	0.34
Valves	☐ Yes ☒ No	56	EPA	☐ Gas ☐ Liquid ☒ Both	0.28	<0.01	3.87
Safety Relief Valves	☐ Yes ☒ No	3	EPA	☐ Gas ☐ Liquid ☒ Both	0.01	<0.01	0.45
Open Ended Lines	☐ Yes ☒ No	20	EPA	☒ Gas ☐ Liquid ☐ Both	0.06	<0.01	4.60
Sampling Connections	☐ Yes ☒ No	17	TECQ	☐ Gas ☐ Liquid ☒ Both	1.16	0.01	23.60
Connections (Not sampling)	☐ Yes ☒ No	237	EPA	☐ Gas ☐ Liquid ☒ Both	0.13	<0.01	2.00
Compressors	☐ Yes ☒ No	1	API	☒ Gas ☐ Liquid ☐ Both	0.02	<0.01	1.26
Flanges	☐ Yes ☒ No	120	API	☐ Gas ☐ Liquid ☒ Both	0.09	<0.01	4.47
Other[1]	☐ Yes ☒ No	16	n/a	☒ Gas ☐ Liquid ☐ Both	0.04	<0.01	0.055

[1] Other equipment types may include compressor seals, relief valves, diaphragms, drains, meters, etc.

Please provide an explanation of the sources of fugitive emissions (e.g. pigging operations, equipment blowdowns, pneumatic controllers, etc.): **Blowdowns**

Please indicate if there are any closed vent bypasses (include component): **No**

Specify all equipment used in the closed vent system (e.g. VRU, ERD, thief hatches, tanker truck/rail car loading, etc.)
Thief Hatch, VRU, Enclosed Combustors

ATTACHMENT K – GAS WELL AFFECTED FACILITY DATA SHEET

Complete this data sheet if you are the owner or operator of a gas well affected facility for which construction, modification or reconstruction commenced after August 23, 2011. This form must be completed for natural gas well affected facilities regardless of when flowback operations occur (or have occurred).

API Number	Date of Flowback	Date of Well Completion	Green Completion and/or Combustion Device	Subject to OOOO or OOOOa?
47-095-02315	December 2016	2-1-2017	Flow to separator and into gathering line as soon as practical.	47-095-02315
47-095-02334	December 2016	2-1-2017	Flow to separator and into gathering line as soon as practical.	47-095-02334

Note: If future wells are planned and no API number is available please list as PLANNED.
If there are existing wells that commenced construction prior to August 23, 2011, please acknowledge as existing.

This is the same API (American Petroleum Institute) well number(s) provided in the well completion notification and as provided to the WVDEP, Office of Oil and Gas for the well permit. The API number may be provided on the application without the state code (047).

Every oil and gas well permitted in West Virginia since 1929 has been issued an API number. This API is used by agencies to identify and track oil and gas wells.

The API number has the following format: 047-001-00001

Where,

047 = State code. The state code for WV is 047.
001 = County Code. County codes are odd numbers, beginning with 001 (Barbour) and continuing to 109 (Wyoming).
00001= Well number. Each well will have a unique well number.

ATTACHMENT N – INTERNAL COMBUSTION ENGINE DATA SHEET

Complete this data sheet for each internal combustion engine at the facility. Include manufacturer performance data sheet(s) or any other supporting document if applicable. Use extra pages if necessary. *Generator(s) and microturbine generator(s) shall also use this form.*

Emission Unit ID#[1]	VRU-1	CE-1	
Engine Manufacturer/Model	Cummins G5.9	Caterpillar G3516 BLE	
Manufacturers Rated bhp/rpm	84 @ 1800	1380 @ 1400	
Source Status[2]	ES	NS	
Date Installed/ Modified/Removed/Relocated[3]	2016	Upon Receipt of Permit	
Engine Manufactured /Reconstruction Date[4]	After 3/1/2013	3/21/2012	
Check all applicable Federal Rules for the engine (include EPA Certificate of Conformity if applicable)[5]	☒40CFR60 Subpart JJJJ ☐JJJJ Certified? ☐40CFR60 Subpart IIII ☐IIII Certified? ☐40CFR63 Subpart ZZZZ ☐ NESHAP ZZZZ/ NSPS JJJJ Window ☐ NESHAP ZZZZ Remote Sources	☒40CFR60 Subpart JJJJ ☐JJJJ Certified? ☐40CFR60 Subpart IIII ☐IIII Certified? ☐40CFR63 Subpart ZZZZ ☐ NESHAP ZZZZ/ NSPS JJJJ Window ☐ NESHAP ZZZZ Remote Sources	☐40CFR60 Subpart JJJJ ☐JJJJ Certified? ☐40CFR60 Subpart IIII ☐IIII Certified? ☐40CFR63 Subpart ZZZZ ☐ NESHAP ZZZZ/ NSPS JJJJ Window ☐ NESHAP ZZZZ Remote Sources
Engine Type[6]	4SRB	4SLB	
APCD Type[7]	NSCR	OxCat	
Fuel Type[8]	RG	RG	
H_2S (gr/100 scf)	<1	<1	
Operating bhp/rpm	84 @ 1800	1380 @ 1400	
BSFC (BTU/bhp-hr)	7914	8256	
Hourly Fuel Throughput	526.4 ft^3/hr gal/hr	9,021 ft^3/hr gal/hr	ft^3/hr gal/hr
Annual Fuel Throughput (Must use 8,760 hrs/yr unless emergency generator)	4.62 $MMft^3$/yr gal/yr	79.02 $MMft^3$/yr gal/yr	$MMft^3$/yr gal/yr
Fuel Usage or Hours of Operation Metered	Yes ☒ No ☐	Yes ☒ No ☐	Yes ☐ No ☐

Calculation Methodology[9]	**Pollutant[10]**	**Hourly PTE (lb/hr)[11]**	**Annual PTE (tons/year)[11]**	**Hourly PTE (lb/hr)[11]**	**Annual PTE (tons/year)[11]**	**Hourly PTE (lb/hr)[11]**	**Annual PTE (tons/year)[11]**
AP	NO_x	0.19	0.81	1.52	6.66		
AP	CO	0.37	1.62	0.52	2.27		
AP	VOC	0.04	0.18	1.40	6.13		
AP	SO_2	<0.01	<0.01	<0.01	0.03		
AP	PM_{10}	0.013	0.06	0.11	0.50		
AP	Formaldehyde	0.015	0.065	0.32	1.41		
AP	Total HAPs	0.022	0.10	0.53	2.31		
AP	GHG (CO_2e)	89.7	393	1,750	7,666		

1 Enter the appropriate Source Identification Number for each natural gas-fueled reciprocating internal combustion engine/generator engine located at the well site. Multiple engines should be designated CE-1, CE-2, CE-3 etc. Generator engines should be designated GE-1, GE-2, GE-3 etc. Microturbine generator engines should be designated MT-1, MT-2, MT-3 etc. If more than three (3) engines exist, please use additional sheets.

2 Enter the Source Status using the following codes:

NS Construction of New Source (installation) ES Existing Source

MS	Modification of Existing Source	RS	Relocated Source
REM	Removal of Source		

3 Enter the date (or anticipated date) of the engine's installation (construction of source), modification, relocation or removal.

4 Enter the date that the engine was manufactured, modified or reconstructed.

5 Is the engine a certified stationary spark ignition internal combustion engine according to 40CFR60 Subpart IIII/JJJJ? If so, the engine and control device must be operated and maintained in accordance with the manufacturer's emission-related written instructions. You must keep records of conducted maintenance to demonstrate compliance, but no performance testing is required. If the certified engine is not operated and maintained in accordance with the manufacturer's emission-related written instructions, the engine will be considered a non-certified engine and you must demonstrate compliance as appropriate.

Provide a manufacturer's data sheet for all engines being registered.

6 Enter the Engine Type designation(s) using the following codes:

2SLB	Two Stroke Lean Burn	4SRB	Four Stroke Rich Burn
4SLB	Four Stroke Lean Burn		

7 Enter the Air Pollution Control Device (APCD) type designation(s) using the following codes:

A/F	Air/Fuel Ratio	IR	Ignition Retard
HEIS	High Energy Ignition System	SIPC	Screw-in Precombustion Chambers
PSC	Prestratified Charge	LEC	Low Emission Combustion
NSCR	Rich Burn & Non-Selective Catalytic Reduction	OxCat	Oxidation Catalyst
SCR	Lean Burn & Selective Catalytic Reduction		

8 Enter the Fuel Type using the following codes:

PQ	Pipeline Quality Natural Gas	RG	Raw Natural Gas /Production Gas	D	Diesel

9 Enter the Potential Emissions Data Reference designation using the following codes. Attach all reference data used.

MD	Manufacturer's Data	AP	AP-42	
GR	GRI-HAPCalc™	OT	Other	(please list)

10 Enter each engine's Potential to Emit (PTE) for the listed regulated pollutants in pounds per hour and tons per year. PTE shall be calculated at manufacturer's rated brake horsepower and may reflect reduction efficiencies of listed Air Pollution Control Devices. Emergency generator engines may use 500 hours of operation when calculating PTE. PTE data from this data sheet shall be incorporated in the *Emissions Summary Sheet*.

11 PTE for engines shall be calculated from manufacturer's data unless unavailable.

Engine Air Pollution Control Device
(Emission Unit ID# CE-1)

Air Pollution Control Device Manufacturer's Data Sheet included?
Yes ☒ No ☐

☐ NSCR	☐ SCR	☒ Oxidation Catalyst

Provide details of process control used for proper mixing/control of reducing agent with gas stream: n/a

Manufacturer: **EMIT Technologies, Inc.**	Model #: **ELX-4200Z-1616F-31CEO-36P**
Design Operating Temperature: 1000 ºF	Design gas volume: **9126 + scfm**
Service life of catalyst: **2+ years, depending on site conditions**	Provide manufacturer data? ☒Yes ☐ No
Volume of gas handled: **9126 acfm at 1078 ºF**	Operating temperature range for NSCR/Ox Cat: **From 750 ºF to 1250 ºF**
Reducing agent used, if any: **None**	Ammonia slip (ppm): **N/A**

Pressure drop against catalyst bed (delta P): **3.0 inches of H_2O**

Provide description of warning/alarm system that protects unit when operation is not meeting design conditions: **Part of the routine maintenance inspection to warn or alert operations of emissions control degradation is a task called the post-PM emissions check.**

Is temperature and pressure drop of catalyst required to be monitored per 40CFR63 Subpart ZZZZ?
☐ Yes ☒ No

How often is catalyst recommended or required to be replaced (hours of operation)?
Because there are so many factors that impact life of a catalyst, the vendor does not recommend "hours of operation prior to replacement." The routine post-PM emissions check task (every 60 days or 1440 hrs of operation, whichever comes first) determines when the catalyst needs to be serviced or replaced.

How often is performance test required?
☒ Initial
☐ Annual
☒ Every 8,760 hours of operation
☐ Field Testing Required
☐ No performance test required. If so, why (please list any maintenance required and the applicable sections in NSPS/GACT)?

USA Compression Unit 2302 Caterpillar G3516BLE Engine Emissions

Date of Manufacture	March 22, 2012	Engine Serial Number	JEF01613	Date Modified/Reconstructed	Not Any
Driver Rated HP	1380	Rated Speed in RPM	1400	Combustion Type	Spark Ignited 4 Stroke
Number of Cylinders	16	Compression Ratio	8:1	Combustion Setting	Ultra Lean Burn
Total Displacement (in^3)	4230	Fuel Delivery Method	Carburetor	Combustion Air Treatment	T.C./Aftercooled

Raw Engine Emissions (905 LHV BTU/SCF Fuel Gas with little to no H2S)

Fuel Consumption *7443 LHV BTU/bhp-hr or 8256 HHV BTU/bhp-hr*
Altitude *1200 ft*
Maximum Air Inlet Temp *105 F*

	g/bhp-hr [1]	lb/MMBTU [2]	lb/hr	TPY
Nitrogen Oxides (NOx)	0.5		1.52	6.66
Carbon Monoxide (CO)	2.43		7.39	32.38
Volatile Organic Compounds (VOC or NMNEHC)	0.92		2.80	12.26
Formaldehyde (CH2O)	0.44		1.34	5.86
Particulate Matter (PM) Filterable+Condensable		9.99E-03	1.14E-01	4.98E-01
Sulfur Dioxide (SO2)		5.88E-04	6.70E-03	2.93E-02

	g/bhp-hr [1]	lb/hr	Metric Tonne/yr
Carbon Dioxide (CO2)	474	1442	5729
Methane (CH4)	4.05	12.32	48.95

[1] g/bhp-hr are based on Caterpillar Specifications (GERP) assuming 905 LHV BTU/SCF fuel gas, 1200 ft elevation, and 105 F Max Air Inlet Temperature. Note that g/bhp-hr values are based on 100% Load Operation. For Air Permitting, it is recommended to add a safety margin to CO, VOC, and Formaldehyde to account for variations in fuel gas composition and load.

[2] Emission Factor obtained from EPA's AP-42, Fifth Edition, Volume I, Chapter 3: Stationary Internal Combution Sources (Section 3.2 Natural Gas-Fired Reciprocating Engines, Table 3.2-2).

Catalytic Converter Emissions

Catalytic Converter Make amd Model: *EMIT ELX-4200Z-1616F-31CEO-36P*
Element Type: *EMIT RE-3615Z*
Number of Elements in Housing: *1.5*
Air/Fuel Ratio Control *Caterpillar ADEM3, NOx Feedback*

	% Reduction		**lb/hr**	**TPY**
Nitrogen Oxides (NOx)	0		**1.52**	**6.66**
Carbon Monoxide (CO)	93		**0.52**	**2.27**
Volatile Organic Compounds (VOC or NMNEHC)	50	(use 30% DRE for High BTU Fuels)	**1.40**	**6.13**
Formaldehyde (CH2O)	76		**0.32**	**1.41**
Particulate Matter (PM)	0		**1.14E-01**	**4.98E-01**
Sulfur Dioxide (SO2)	0		**6.70E-03**	**2.93E-02**

	% Reduction	**lb/hr**	**Metric Tonne/yr**
Carbon Dioxide (CO2)	0	**1442**	**5729**
Methane (CH4)	0	**12.32**	**48.95**

G3516B

GAS COMPRESSION APPLICATION

GAS ENGINE SITE SPECIFIC TECHNICAL DATA
G3516B

CATERPILLAR®

ENGINE SPEED (rpm):	1400	FUEL SYSTEM:	CAT WIDE RANGE WITH AIR FUEL RATIO CONTROL
COMPRESSION RATIO:	8:1		
AFTERCOOLER - STAGE 2 INLET (°F):	130	**SITE CONDITIONS:**	
AFTERCOOLER - STAGE 1 INLET (°F):	201	FUEL:	Nat Gas
JACKET WATER OUTLET (°F):	210	FUEL PRESSURE RANGE(psig):	7.0-50.0
COOLING SYSTEM:	JW+OC+1AC, 2AC	FUEL METHANE NUMBER:	84.8
IGNITION SYSTEM:	ADEM3	FUEL LHV (Btu/scf):	905
EXHAUST MANIFOLD:	DRY	ALTITUDE(ft):	1200
COMBUSTION:	Ultra Lean Burn	MAXIMUM INLET AIR TEMPERATURE(°F):	105
NOx EMISSION LEVEL (g/bhp-hr NOx):	0.5	NAMEPLATE RATING:	1380 bhp@1400rpm
SET POINT TIMING:	30.0		

			MAXIMUM RATING	SITE RATING AT MAXIMUM INLET AIR TEMPERATURE		
RATING	**NOTES**	**LOAD**	**100%**	**100%**	**75%**	**50%**
ENGINE POWER	(1)	bhp	1380	1380	1035	690
INLET AIR TEMPERATURE		°F	106	105	105	105
ENGINE DATA						
FUEL CONSUMPTION (LHV)	(2)	Btu/bhp-hr	7443	7443	7972	8562
FUEL CONSUMPTION (HHV)	(2)	Btu/bhp-hr	8256	8256	8843	9498
AIR FLOW	(3)(4)	lb/hr	13863	13863	10874	7602
AIR FLOW WET (77°F, 14.7 psia)	(3)(4)	scfm	3126	3126	2452	1715
INLET MANIFOLD PRESSURE	(5)	in Hg(abs)	94.6	94.6	76.8	54.0
EXHAUST STACK TEMPERATURE	(6)	°F	992	992	986	1006
EXHAUST GAS FLOW (@ stack temp, 14.5 psia)	(7)(4)	ft3/min	9126	9126	7138	5065
EXHAUST GAS MASS FLOW	(7)(4)	lb/hr	14380	14380	11290	7900
EMISSIONS DATA						
NOx (as NO2)	(8)	g/bhp-hr	0.50	0.50	0.50	0.50
CO	(8)	g/bhp-hr	2.43	2.43	2.61	2.56
THC (mol. wt. of 15.84)	(8)	g/bhp-hr	4.77	4.77	5.11	5.19
NMHC (mol. wt. of 15.84)	(8)	g/bhp-hr	0.72	0.72	0.77	0.78
NMNEHC (VOCs) (mol. wt. of 15.84)	(8)(9)	g/bhp-hr	0.48	0.48	0.51	0.52
HCHO (Formaldehyde)	(8)	g/bhp-hr	0.44	0.44	0.43	0.42
CO2	(8)	g/bhp-hr	474	474	506	550
EXHAUST OXYGEN	(10)	% DRY	9.0	9.0	8.7	8.3
HEAT REJECTION						
HEAT REJ. TO JACKET WATER (JW)	(11)	Btu/min	23438	23438	21564	19970
HEAT REJ. TO ATMOSPHERE	(11)	Btu/min	6110	6110	5092	4074
HEAT REJ. TO LUBE OIL (OC)	(11)	Btu/min	4449	4449	3947	3323
HEAT REJ. TO A/C - STAGE 1 (1AC)	(11)(12)	Btu/min	12934	12934	10814	3965
HEAT REJ. TO A/C - STAGE 2 (2AC)	(11)(12)	Btu/min	5679	5679	5341	3462

HEAT EXCHANGER SIZING CRITERIA			
TOTAL JACKET WATER CIRCUIT (JW+OC+1AC)	(12)(13)	Btu/min	44701
TOTAL AFTERCOOLER CIRCUIT (2AC)	(12)(13)	Btu/min	5963
A cooling system safety factor of 0% has been added to the heat exchanger sizing criteria.			

CONDITIONS AND DEFINITIONS

Engine rating obtained and presented in accordance with ISO 3046/1, adjusted for fuel, site altitude and site inlet air temperature.
100% rating at maximum inlet air temperature is the maximum engine capability for the specified fuel at site altitude and maximum site inlet air temperature.
Max. rating is the maximum capability for the specified fuel at site altitude and reduced inlet air temperature.
Lowest load point is the lowest continuous duty operating load allowed. No overload permitted at rating shown.

For notes information consult page three.

PREPARED BY: Joel LeBlanc, USA Compression
Data generated by Gas Engine Rating Pro Version 3.04.00
Ref. Data Set DM8800-04-002, Printed 31Jan2011

772 Airfield Lane
Sheridan, WY 82801
Office: 307.673.0883
EST@emittechnologies.com

Prepared For:
Joel LeBlanc
USA COMPRESSION

INFORMATION PROVIDED BY CATERPILLAR

Engine:	G3516B
Horsepower:	1380
RPM:	1400
Compression Ratio:	8.0:1
Exhaust Flow Rate:	9126 CFM
Exhaust Temperature:	992 °F
Reference:	DM8800-04
Fuel:	Natural Gas
Annual Operating Hours:	8760

Uncontrolled Emissions

NOx:	0.50 g/bhp-hr
CO:	2.43 g/bhp-hr
THC:	4.77 g/bhp-hr
NMHC:	0.72 g/bhp-hr
NMNEHC:	0.48 g/bhp-hr
HCHO:	0.44 g/bhp-hr
Oxygen:	9.00 %

POST CATALYST EMISSIONS

NOx:	Unaffected by Oxidation Catalyst
CO:	>93% Reduction
VOC:	>50% Reduction
HCHO:	>76% Reduction

CONTROL EQUIPMENT

Catalytic Converter

Model:	**ELX-4200Z-1616F-31CE0-36P**
Catalyst Type:	Oxidation, Precious group metals
Manufacturer:	EMIT Technologies, Inc.
Element Size:	1 - Rectangle 36 x 15 x 3.5 1 - Rectangle 18 x 15 x 3.5
Catalyst Elements:	2
Housing Type:	3 Element Capacity
Catalyst Installation:	Accessible Housing
Construction:	10 gauge Carbon Steel
Sample Ports:	6 (0.5" NPT)
Inlet Connections:	16" Flat Face Flange
Outlet Connections:	16" Flat Face Flange
Configuration:	End In / Side Out
Silencer:	Integrated
Silencer Grade:	Hospital Enhanced
Insertion Loss:	35-50 dBA

Vapor Combustor Unit (VCU)

HY-BON/EDI is pleased to provide the CH2.5 and CH10.0 enclosed combustors as an effective solution for eliminating VOC emissions. HY-BON/EDI's insulated combustors are automated and have been successfully tested per EPA 40, CFR 60 guidelines – making it the perfect blend of performance and safety. The combustor comes as a complete, skid mounted package containing the liquid knock-out vessel, liquid transfer pump, flame arrestor, bird screen and burner control system. Installation is simple and field performance adjustments can be made as production changes – making it the most flexible solution in the industry.

- EPA 40 CFR 60, Quad O Compliant
  List of EPA Approved Combustion Control Devices
- Completely Enclosed Combustion
- 99.99% Destruction Efficiency
- User Friendly Automated System
- Operational and Quad O reporting data can be saved to a USB Key
- RS-232 or RS-485 Communication supports satellite, cellular, or radio
- Modbus Slave Protocol allows it to communicate with SCADA systems and other devices/software

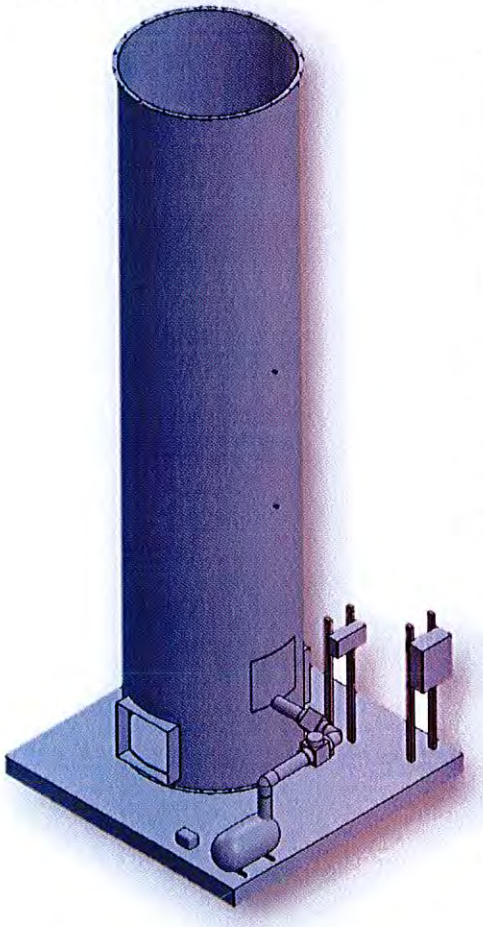
GENERAL PROPERTIES	CH2.5	CH10.0
BURNER SIZE (MMBTU/hr)	2.5	10.0
OUTER DIAMETER (inches)	34	54
HEIGHT (feet)	16	20
INLET PRESSURE (oz/in²)	≥ 0.5	
DESTRUCTION EFFICIENCY	≥ 99.99%	
SMOKELESS CAPACITY	100%	
TURN DOWN	SCALABLE	

HY-BON/EDI
Vent Gas Management

2404 Commerce Dr.
Midland, TX 79703
432-697-2292
hy-bon.com

100 Ayers Blvd.
Belpre, OH 45714
740-401-4000
ediplungerlift.com

With the fairly recent publication of the NSPS OOOO emission standard, all storage tank facilities constructed on or after August 23, 2011 will be allowed to emit 6 Tons or less of VOC's per year. This regulation not only forces companies to monitor and control their emissions, but it also forces the *means* of emission monitoring and controlling to be more reliable and exact. In response to such a stringent protocol, HY-BON Engineering Company is pleased to offer the **CH10.0** enclosed Vapor Combustor Unit (VCU). Built upon a foundation of 60+ years' experience with tank vapors, the VCU is the solution for reducing residual tank vapor emissions when a Vapor Recovery Unit (VRU) is not sufficient or a viable option.



GENERAL PROPERTIES	
TYPE	Enclosed Tank Battery Flare
AMBIENT TEMPERATURE	-20 °F to +100 °F
PILOT FUEL REQUIREMENTS	Propane or Site Gas @5psi of natural gas = 13.3 SCFM @5psi of propane = 12.5 SCFM
BURNER SIZE	10.0 million BTU/hr
INLET PRESSURE REQUIRMENTS	Minimum 0.5 oz/in^2 (~1.0 inches w.c.)
TURN DOWN RATIO	5:1
DESTRUCTION EFFICIENCY	99.99% DRE
MECHANICAL PROPERTIES	
DESIGN WIND SPEED	100 MPH
AMBIENT TEMPERATURE	-20 °F to +120 °F
ELECTRICAL AREA CLASSIFICATION	General Area Classification (Non-Hazardous)
ELEVATION	up to 3,000ft ASL
PROCESS PROPERTIES	
SMOKELESS CAPACITY	100%
OPERATING TEMPERATURE	800 °F to 2000 °F (1500 °F Nominal)
UTILITIES	
PILOT GAS	Process Gas
ELECTRICITY	1 Phase, 60 Hz, 120V/10A
SOLAR PANEL OPTION AVAILABLE	YES

- EPA 40 CFR 60, Quad O Compliant
- Completely Enclosed Combustion
- 99.99% Destruction Efficiency
- Fully Automated System
- Output Operational Data via Thumb Drive
- Capable of SCADA Integration

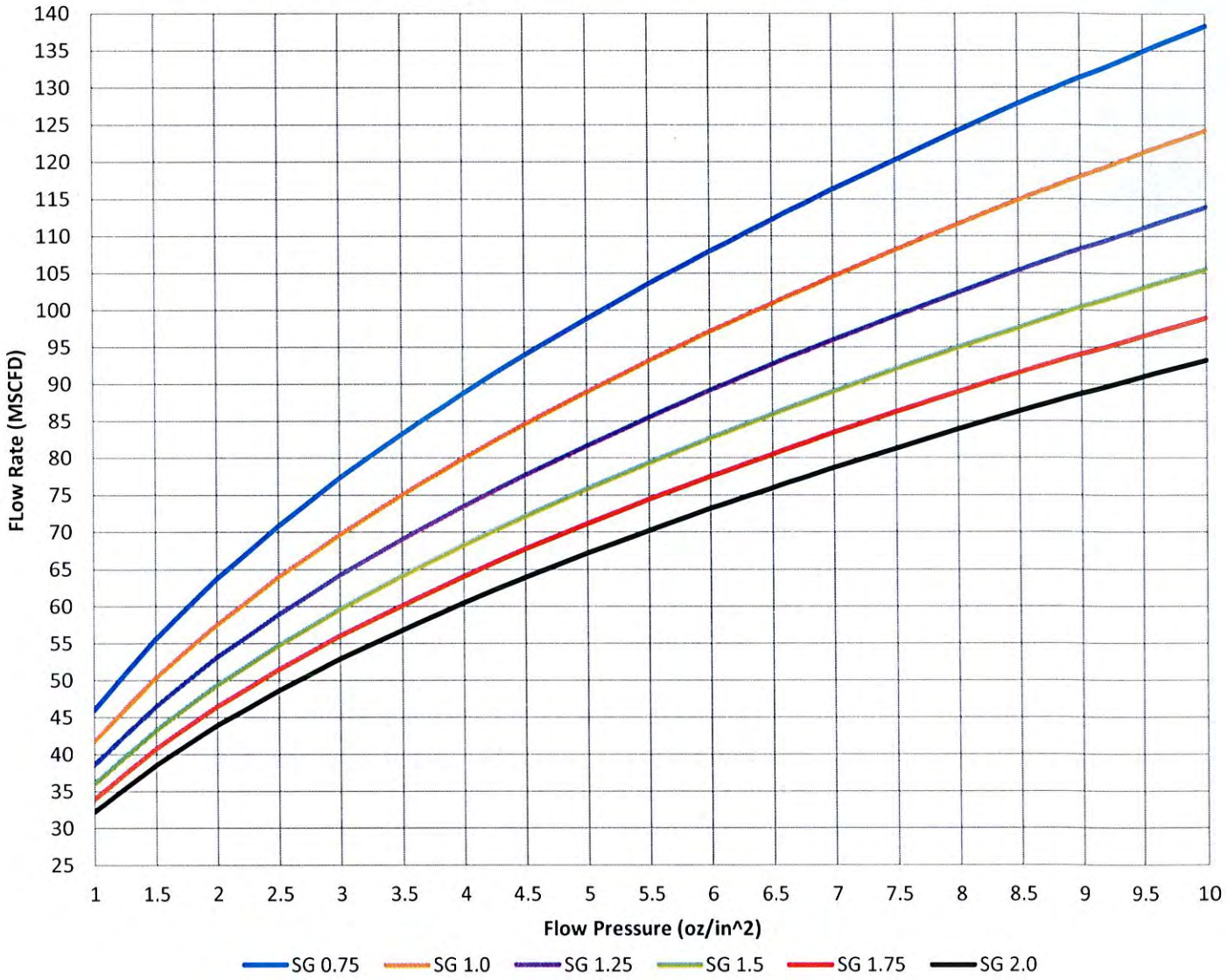
Revision #3: 09/04/2015

HY-BON/EDI
Vent Gas Management

2404 Commerce Dr.
Midland, TX 79703
432-697-2292
hy-bon.com

100 Ayers Blvd.
Belpre, OH 45714
740-401-4000
ediplungerlift.com

CH10.0: Flow Rate vs Flow Pressure with Corresponding Specific Gravity



ATTACHMENT P – GLYCOL DEHYDRATION UNIT DATA SHEET

Complete this data sheet for each Glycol Dehydration Unit, Reboiler, Flash Tank and/or Regenerator at the facility. Include gas sample analysis and GRI- GLYCalc™ input and aggregate report. Use extra pages if necessary.

Manufacturer: Cameron	Model:
Max. Dry Gas Flow Rate: 20 mmscf/day	Reboiler Design Heat Input: 200 MMBTU/hr
Design Type: ☒ TEG ☐ DEG ☐ EG	Source Status[1]: NS
Date Installed/Modified/Removed[2]: Upon Permit	Regenerator Still Vent APCD/ERD[3]: TO
Control Device/ERD ID#[3]: EC-2	Fuel HV (BTU/scf): 1263
H_2S Content (gr/100 scf): <0.001%	Operation (hours/year): 8760
Pump Rate (gpm): 3.5	
Water Content (wt %) in: Wet Gas: Saturated	Dry Gas: 7.0 lb/MMscf

Is the glycol dehydration unit exempt from 40CFR63 Section 764(d)? ☒ Yes ☐ No: If Yes, answer the following:

The actual annual average flowrate of natural gas to the glycol dehydration unit is less than 85 thousand standard cubic meters per day, as determined by the procedures specified in §63.772(b)(1) of this subpart. ☐ Yes ☒ No

The actual average emissions of benzene from the glycol dehydration unit process vent to the atmosphere are less than 0.90 megagram per year (1 ton per year), as determined by the procedures specified in §63.772(b)(2) of this subpart. ☒ Yes ☐ No

Is the glycol dehydration unit located within an Urbanized Area (UA) or Urban Cluster (UC)? ☐ Yes ☒ No

Is a lean glycol pump optimization plan being utilized? ☐ Yes ☒ No

Recycling the glycol dehydration unit back to the flame zone of the reboiler.
☐ Yes ☒ No

Recycling the glycol dehydration unit back to the flame zone of the reboiler and mixed with fuel.
☐ Yes ☒ No

What happens when temperature controller shuts off fuel to the reboiler? **Still vent to enclosed combustor.**
☐ Still vent emissions to the atmosphere.
☐ Still vent emissions stopped with valve.
☐ Still vent emissions to glow plug.

Please indicate if the following equipment is present.
☐ Flash Tank
☐ Burner management system that continuously burns condenser or flash tank vapors

Control Device Technical Data

Pollutants Controlled	Manufacturer's Guaranteed Control Efficiency (%)
Hydrocarbons	99+% (Note: 98% used for calculations)

Emissions Data

Emission Unit ID / Emission Point ID[4]	Description	Calculation Methodology[5]	PTE[6]	Controlled Maximum Hourly Emissions (lb/hr)	Controlled Maximum Annual Emissions (tpy)
RBV-2 / 14E	Reboiler Vent	AP-42	NO_x	0.02	0.09
		AP-42	CO	0.02	0.07
		AP-42	VOC	<0.01	0.005
		AP-42	SO_2	<0.01	<0.01
		AP-42	PM_{10}	<0.01	0.007
		AP-42	GHG (CO_2e)	24.2	105.8

RSV-2 / 11E	Glycol Regenerator Still Vent	GRI-GlyCalc™	VOC	0.37	1.64
		GRI-GlyCalc™	Benzene	0.005	0.02
		GRI-GlyCalc™	Toluene	0.016	0.07
		GRI-GlyCalc™	Ethylbenzene	<0.01	<0.01
		GRI-GlyCalc™	Xylenes	<0.01	<0.01
		GRI-GlyCalc™	n-Hexane	0.009	0.04
None	Glycol Flash Tank	GRI-GlyCalc™	VOC		
		GRI-GlyCalc™	Benzene		
		GRI-GlyCalc™	Toluene		
		GRI-GlyCalc™	Ethylbenzene		
		GRI-GlyCalc™	Xylenes		
		GRI-GlyCalc™	n-Hexane		

1 Enter the Source Status using the following codes:
NS Construction of New Source ES Existing Source
MS Modification of Existing Source

2 Enter the date (or anticipated date) of the glycol dehydration unit's installation (construction of source), modification or removal.

3 Enter the Air Pollution Control Device (APCD)/Emission Reduction Device (ERD) type designation using the following codes and the device ID number:
NA None CD Condenser FL Flare
CC Condenser/Combustion Combination TO Thermal Oxidizer O Other (please list)

4 Enter the appropriate Emission Unit ID Numbers and Emission Point ID Numbers for the glycol dehydration unit reboiler vent and glycol regenerator still vent. The glycol dehydration unit reboiler vent and glycol regenerator still vent should be designated RBV-1 and RSV-1, respectively. If the well site incorporates multiple glycol dehydration units, a Glycol Dehydration Emission Unit Data Sheet shall be completed for each, using Source Identification RBV-2 and RSV-2, RBV-3 and RSV-3, etc.

5 Enter the Potential Emissions Data Reference designation using the following codes:
MD Manufacturer's Data AP AP-42
GR GRI-GLYCalc™ OT Other (please list)

6 Enter the Reboiler Vent and Glycol Regenerator Still Vent Potential to Emit (PTE) for the listed regulated pollutants in lbs per hour and tons per year. The Glycol Regenerator Still Vent potential emissions may be determined using the most recent version of the thermodynamic software model GRI-GLYCalc™ (Radian International LLC & Gas Research Institute). **Attach all referenced Potential Emissions Data (or calculations) and the GRI-GLYCalc™ Aggregate Calculations Report (shall include emissions reports, equipment reports, and stream reports) to this Glycol Dehydration Emission Unit Data Sheet(s). Backup pumps do not have to be considered as operating for purposes of PTE.** This PTE data shall be incorporated in the Emissions Summary Sheet.

OPTION A for 10.0 MM per day from 9.0 MM per day

Substitute 36" OD Glycol Tower in lieu of 30" tower 210/350 reconcentrator will remain the same.

NET PRICE ADDER OPTION A, F.O.B. ELECTRA, TX..... $ 7,670.00

DESIGN CONDITIONS B

Gas Flow Rate	20 MMSCFD
Gas Specific Gravity	0.65
Operating Pressure & Temperature	960 psig @ 100°F
Design Pressure & Temperature	1,440 psig @ 140°F

ITEM I – MISTTRAP™-V COALESCING FILTER SEPARATOR – P/N 99501020

ONE (1) CAMERON 20"OD X 6'-0" S/S, 1440# DESIGN VERTICAL COALESCING FILTER WITH 20" YALE TYPE 500 R QUICK OPEN CLOSURE, ASME CODE CONSTRUCTED AND STAMPED, COMPLETE AS FOLLOWS:

A. VESSEL DESIGN PARAMETERS

Design Pressure / Temperature	1440 psig / 130 °F
Lower Head	2:1 Elliptical (516-70), 0.82" minimum
Upper Head	Full Size Quick Opening Closure with Davit
Shell	20" OD, 0.969", SA-106-C
Corrosion Allowance	N/A
Radiography	RT-2
Post Weld Heat Treatment	No

B. VESSEL INTERNALS / ATTACHMENTS

6. One internal element support plate with seven (7) risers
7. Seven (7) CAMERON Coalescing Elements, Model NGC5036RA1VC (1 micron)
8. One (1) welded warning plate
9. One (1) welded vessel nameplate
10. One (1) supports skirt and base ring

C. VESSEL CONNECTIONS

10. One (1) 6" 600# RF flange – INLET
11. One (1) 6" 600# RF flange – GAS OUTLET

12. Two (2) 2" 3000# couplets – LEVEL CONTROLLERS
13. Two (2) 2" 3000# couplets – SIGHT GLASSES
14. Two (2) 1" 3000# couplets – LIQUID OUTLETS
15. One (1) 1" 3000# couplet – PSV
16. Two (2) ½" 3000# couplets – DIFFERENTIAL PRESSURE GAUGE
17. One (1) ½" 3000# couplet – PRESSURE GAUGE
18. One (1) 30" ANSI 600 Yale Type 500 R Closure – FILTER ACCESS

E. PAINTING

1. Mechanically Cleaned
3. Coating - One Coat of CAMERON Standard Mesa Tan Primer

F. MANUAL

One (1) Installation and Operations Manual – P/N 61440037

ITEM II – ACCESSORIES FOR FILTER SEPARATOR – P/N 48820100

J. Two (2) Norriseal liquid level controllers, Series 1005 P1, 2" NPT, Model 1018VP, pneumatic pilot
K. Two (2) Invalco liquid level valve, 1" NPT, model DSG-160-418, 6000#, 1/4" port
L. Two (2) Wellmark sight glasses, 2" MNPT, plain lens, 1500#
M. One (1) Wellmark relief valve, 1" x 1" NPT, set at 1440#, model W9501-RS-1600, ASME code
N. One (1) Pressure gauge, 0-2000 psi, ¼" connection, SS housing, complete with ¼" isolation valve
O. One (1) Midwest pressure differential gauge, 0-30 psid, 2.5" dial, model 120-AA-00-00-30
P. Three (3) ¼" 2000# 316 SS ball valves for dP gauge and pressure gauge, PBVS-5312-08-3600-GG-NL
Q. Four (4) 1" NPT 2000# regular port ball valves, CS body/ SS trim, PBVC-5312-38-2236-TL-NC
R. Two (2) 1" NPT 2000# globe valves, Smith G80 or equal for dump valve by-pass.

(Note - Accessory package to be shipped loose if ordered)

PRICING:

All net prices are Ex-Works, CAMERON Electra, Texas fabrication facility.

ITEM I – MISTTRAP™-V COALESCING FILTER SEPARATOR- P/N 99501020
NET PRICE .....$ 25,065.00 ea

ITEM II & III: GLYCOL DEHYDRATION UNIT, Designed for and consisting of:

Volume of Gas	20 MMSCFD
Inlet Pressure	960 psig
Inlet Temperature	100 F
Specific Gravity	0.65
Inlet Water Dewpoint	100% Saturation
Outlet Water Dewpoint	7# per MM

(A) One (1) NATCO 30" OD x 25'-0" shell length x 1440 psig working pressure, ASME Code Constructed and National Board Stamped, Glycol Contactor Tower complete with Integral Scrubber, Outside Gas/Glycol Heat Exchanger and complete as follows: **P/N 99550308**

1) **VESSEL INTERNALS:**

a) 8 Bubble Cap Trays on 24" spacing
b) Inlet Gas Diverter
c) Full Diameter 304 SS wire mesh mist extractors in scrubber and tower, 9# density
d) Extra heavy chimney tray and gas riser for longer life

2) **VESSEL EXTERNALS:**

a) Welded steel skirt and base plate
b) One External Gas/Glycol Heat Exchanger

3) **VESSEL CONNECTIONS:**

a) One (1) 4" 600# ANSI RF flanged	GAS INLET
b) One (1) 2" FPT Conn..	LLC
c) One (1) 1" 6000# threaded coupling	RELIEF
d) One (1) 4" 600# ANSI RF flanged	GAS OUTLET
e) One (1) 1" 6000# threaded coupling	LIQUID OUT
f) One (1) 1/2" 6000# threaded cplg	PRESS GAUGE
g) One (1) 1/2" 6000# threaded cplg	THERMOMETER
h) One (1) 1" 6000# threaded coupling	GLYCOL IN
i) One (1) 1" 6000# threaded coupling	GLYCOL OUT
j) One (1) 1" 6000# threaded coupling	GLYCOL DRAIN

4) **ACCESSORIES FURNISHED:**

a) One (1) INVALCO model CTU-215S liquid level control.
b) One (1) INVALCO model DSG-160 diaphragm operated liquid discharge valve, with 1/4" SS trim or equal
c) One (1) ASME 1" x 1" threaded safety relief valve set at 1440 psig
d) One 3" dial type thermometer with thermowell
e) One (1) 2-1/2" dial, 2000# pressure gage with 1/2" 6000# isolating valve
f) One (1) lot instrument gas tubing and tubing fittings to hookup Level Control and Dump Valve

g) One set of gaskets, studs and nuts for connection of Gas/Glycol Heat Exchanger to Contactor Gas Outlet

5) **COATING:**

Complete exterior of vessel is commercially blasted and painted one coat Mesa Tan Primer

ITEM III : SKID MOUNTED GLYCOL RECONCENTRATOR ASSEMBLY

B) **One (1) NATCO MODEL 210/350 TEG Glycol Reconcentrator Assembly** with the following equipment mounted, piped and interconnected: 99560350 with one extra glycol/glycol heat exchanger. **P/N 99560350,**

3) One (1) 24" OD x 8'-6" long Reboiler with a 24"OD x 6'-6" long Surge Tank, 3 psig - Non-Code

Assembly complete with:

a) One (1) 8.625" OD, 0.200MM BTU/Hr removable firetube
b) One (1) 8.625" OD flanged, removable stack
c) One (1) Flame Arrestor with burner and pilot assembly
d) One (1) set of gas firing accessories including: Preheat line, fuel gas regulator, pilot gas regulator, diaphragm operated fuel gas control valve, 0-30# pressure gauge, manual shutoff valves and all necessary piping and tubing
e) Two (2) Kimray Model T12 Thermostats with thermowells, One for reconcentrator temperature control and one for high temperature shutdown
f) One (1) 3" dial type thermometer with thermowell
g) Two (1) tubular type gauge glass assembly with safety gage cocks and gauge glass guard, one located in reconcentrator section and one in surge section.
h) Two (2) fill connections, one in reconcentrator section and one in Surge section

4) One (1) 10.725" OD x 4'-0" long, non-code, flanged reflux column
a) complete with 1" ceramic packing
b) 1" reflux coil.

(3) Six (6) 3" x 1.5" x 10'-0" finned double pipe heat exchangers rated for 247,000 BTU/Hr.

(4) One (1) Nowata Model 1S3C-2000T glycol sock filter assembly (for rich glycol) complete with filter cartridges installed.

(5) One (1) Kimray 21015 PV gas driven glycol pump

(6) The reboiler, surge, and still column to be insulated with 1-1/2" Easy Wrap and covered with an aluminum jacket.

NET PRICE ITEM II & III, F.O.B. ELECTRA, TX..... $ 75,984.00

ATTACHMENT Q – PNEUMATIC CONTROLLERS DATA SHEET

Are there any continuous bleed natural gas driven pneumatic controllers at this facility that commenced construction, modification or reconstruction after August 23, 2011, and on or before September 18, 2015?

☐ Yes ☒ No

Please list approximate number.

Are there any continuous bleed natural gas driven pneumatic controllers at this facility that commenced construction, modification or reconstruction after September 18, 2015?

☐ Yes ☒ No

Please list approximate number.

Are there any continuous bleed natural gas driven pneumatic controllers at this facility with a bleed rate greater than 6 standard cubic feet per hour that are required based on functional needs, including but not limited to response time, safety and positive actuation that commenced construction, modification or reconstruction after August 23, 2011, and on or before September 18, 2015?

☐ Yes ☒ No

Please list approximate number.

Are there any continuous bleed natural gas driven pneumatic controllers at this facility with a bleed rate greater than 6 standard cubic feet per hour that are required based on functional needs, including but not limited to response time, safety and positive actuation that commenced construction, modification or reconstruction after September 18, 2015?

☐ Yes ☒ No

Please list approximate number.

ATTACHMENT R – PNEUMATIC PUMP DATA SHEET

Are there any natural gas-driven diaphragm pumps located at a well site that commenced construction, modification or reconstruction after September 18, 2015?

☐ Yes ☒ No

Please list.

Source ID #	Date	Pump Make/Model	Pump Size

ATTACHMENT S – AIR POLLUTION CONTROL DEVICE / EMISSION REDUCTION DEVICE SHEETS

Complete the applicable air pollution control device sheets for each flare, vapor combustor, thermal oxidizer, condenser, adsorption system, vapor recovery unit, BTEX Eliminator, Reboiler with and without Glow Plug, etc. at the facility. Use extra pages if necessary.

Emissions calculations must be performed using the most conservative control device efficiency.

The following five (5) rows are only to be completed if registering an alternative air pollution control device.	
Emission Unit ID: **n/a – no new or modified information under this portion.**	Make/Model:
Primary Control Device ID:	Make/Model:
Control Efficiency (%):	APCD/ERD Data Sheet Completed: ☐ Yes ☐ No
Secondary Control Device ID:	Make/Model:
Control Efficiency (%):	APCD/ERD Data Sheet Completed: ☐ Yes ☐ No

VAPOR COMBUSTION
(Including Enclosed Combustors)

General Information

Control Device ID#: EC-2	Installation Date: 2016 ☐ New ☒ Modified - **modification to Waste Gas Info. Below (from New dehydration unit). No physical changes.** ☐ Relocated	
Maximum Rated Total Flow Capacity scfh scfd	Maximum Design Heat Input (from mfg. spec sheet) 10.0 MMBTU/hr	Design Heat Content BTU/scf

Control Device Information

Type of Vapor Combustion Control?

☒ Enclosed Combustion Device ☐ Elevated Flare ☐ Ground Flare
☐ Thermal Oxidizer

Manufacturer: Hy-Bon Model: CH 10.0	Hours of operation per year? 8760

List the emission units whose emissions are controlled by this vapor control device (Emission Point ID#)

Emission Unit ID#	Emission Source Description	Emission Unit ID#	Emission Source Description
RBV-2	Dehydration Unit Still Vent		

If this vapor combustor controls emissions from more than six (6) emission units, please attach additional pages.

Assist Type (Flares only)	Flare Height	Tip Diameter	Was the design per §60.18?
☐ Steam ☐ Air ☐ Pressure ☒ Non	feet	feet	☐ Yes ☐ No Provide determination.

Waste Gas Information

Maximum Waste Gas Flow Rate	Heat Value of Waste Gas Stream	Exit Velocity of the Emissions Stream
31.2 (scfm)	633.6 BTU/ft^3	(ft/s)

Provide an attachment with the characteristics of the waste gas stream to be burned.

Pilot Gas Information

Number of Pilot Lights	Fuel Flow Rate to Pilot Flame per Pilot	Heat Input per Pilot	Will automatic re-ignition be used?
1	798 scfh	985,100 BTU/hr	☒ Yes ☐ No

If automatic re-ignition is used, please describe the method. **The unit will try to re-ignite up to 25 times. After that, it will go into manual mode which means someone will need to manually start. Gas flow is shut off if it fails to ignite.**

Is pilot flame equipped with a monitor to detect the presence of the flame? ☒ Yes ☐ No	If Yes, what type? ☒ Thermocouple ☐ Infrared ☐ Ultraviolet ☐ Camera ☐ Other:

Describe all operating ranges and maintenance procedures required by the manufacturer to maintain the warranty. *(If unavailable, please indicate).* **Operating ranges must be within what was specified in the data sheet.**

Additional information attached? ☒ Yes ☐ No
Please attach copies of manufacturer's data sheets, drawings, flame demonstration per §60.18 or §63.11(b) and performance testing.

ATTACHMENT T – EMISSIONS CALCULATIONS

Provide detailed potential to emit (PTE) emission calculations for criteria and hazardous air pollutants (HAPs) for each emission point identified in the application. For hazardous air pollutants and volatile organic compounds (VOCs), the speciated emission calculations must be included.

Use the following guidelines to ensure complete emission calculations:

- All emission sources and fugitive emissions are included in the emission calculations, as well as all methods used to calculate the emissions.
- Proper emission point identification numbers and APCD and ERD identification numbers are used consistently in the emission calculations that are used throughout the application.
- A printout of the emission summary sheets is attached to the registration application.
- Printouts of any modeling must be included with the emission calculations. The modeling printout must show all inputs/outputs or assumptions that the modeled emissions are based upon.
- If emissions are provided from the manufacturer, the manufacturer's documentation and/or certified emissions must also be included.
- The emission calculations results must match the emissions provided on the emissions summary sheet.
- If calculations are based on a compositional analysis of the gas, attach the laboratory analysis. Include the following information: the location that the sample was taken (and whether the sample was taken from the actual site or a representative site); the date the sample was taken; and, if the sample is considered representative, the reasons that it is considered representative (same gas field, same formation and depth, distance from actual site, etc.).
- Provide any additional clarification as necessary. Additional clarification or information is especially helpful when reviewing modeling calculations to assist the engineer in understanding the basis of assumptions and/or inputs.

Please follow specific guidance provided on the emissions summary sheet when providing the calculations.

Jay-Bee Oil & Gas, Inc.

EMISSIONS SUMMARY

Moe Well Pad Production Facility
Tyler County, WV

Emission Point ID	Emission Unit ID	Description	NOx lb/hr	CO lb/hr	CO2e lb/hr	CH4[4] lb/hr	VOC[4] lb/hr	SO2 lb/hr	PM lb/hr	Benzene lb/hr	Ethylbenzene lb/hr	Xylenes lb/hr	n-Hexane lb/hr	Toluene lb/hr	Formaldehyde lb/hr	Total HAPs lb/hr
13E	CE-1	Compressor Engine (Controlled) NEW	1.52	0.52	1,750	12.32	1.40	0.007	0.11	0.005	0.000	0.002	0.01	0.005	0.321	0.53
1E	HTR-1	GPU #1	0.15	0.13	181.1	0.003	0.01	0.001	0.011				0.003		0.000	0.003
2E	HTR-2	GPU #2	0.15	0.13	181.1	0.003	0.01	0.001	0.011				0.003		0.000	0.003
3E	HTR-3	GPU #3	0.15	0.13	181.1	0.003	0.01	0.001	0.011				0.003		0.000	0.003
4E	HTR-4	Line Heater	0.05	0.04	60.4	0.00	0.00	0.000	0.004				0.001		0.000	0.001
5E	TL-1	Truck Loading - Condensate[2]					2.96						0.16			0.16
6E	TL-2	Truck Loading - Produced Water[2]					0.08						0.01			0.01
7E	VRU-1	VRU Compressor	0.19	0.37	89.7	0.13	0.04	0.000	0.013	0.001	0.000	0.000		0.000	0.015	0.022
8E	TEG-1	Thermoelectric Generator	0.00	0.00	1.6	0.00	0.00	0.000	0.000				0.000		0.000	0.000
12E	T01-T06	Condensate Tanks + Water Tanks[3]			6.5	0.26	1.83			0.00	0.00	0.002	0.055	0.002	0.000	0.060
9E	EC-1	Condensate Tanks + Water Tanks[1]	0.29	1.10	446.6	0.26	1.84	0.001	0.017				0.004		0.000	0.00
10E	RBV-1	500 MBTU/hr Reboiler REMOVE														
11E	EC-2	Dehydration Unit Combustor MODIFY (FROM NEW DEHY)	0.18	0.52	257.6	0.00	0.38	0.001	0.022	0.005			0.01	0.016	0.000	0.03
14E	RBV-2	Dehydration Unit Reboiler NEW	0.02	0.02	24.2	0.00	0.001	0.000	0.002				0.000		0.000	0.000
---	---	Truck Traffic Fugitive Dust							30.10							
---	---	Fugitive Emissions			9.3	0.37	0.41									0.004
Total (Exluding Fugitive Emissions)			2.69	2.95	3180.12	12.73	6.73	0.01	0.20	0.01	0.00	0.00	0.26	0.02	0.34	0.82
Total			2.69	2.95	3189.40	13.10	7.14	0.01	30.30	0.01	0.00	0.00	0.26	0.02	0.34	0.83

Emission Point ID	Emission Unit ID	Description	NOx tpy	CO tpy	CO2e tpy	CH4 tpy	VOC tpy	SO2 tpy	PM tpy	Benzene tpy	Ethylbenzene tpy	Xylenes tpy	n-Hexane tpy	Toluene tpy	Formaldehyde tpy	Total HAPs tpy
13E	CE-1	Compressor Engine (Controlled) NEW	6.66	2.27	7,666	53.97	6.13	0.029	0.50	0.022	0.002	0.009	0.06	0.020	1.407	2.31
1E	HTR-1	GPU #1	0.66	0.55	793	0.02	0.04	0.004	0.05				0.01		0.000	0.01
2E	HTR-2	GPU #2	0.66	0.55	793	0.02	0.04	0.004	0.05				0.01		0.000	0.01
3E	HTR-3	GPU #3	0.66	0.55	793	0.02	0.04	0.004	0.05				0.01		0.000	0.01
4E	HTR-4	Line Heater	0.22	0.18	264	0.01	0.01	0.001	0.02				0.00		0.000	0.00
5E	TL-1	Truck Loading - Condensate[2]					0.91						0.05			0.05
6E	TL-2	Truck Loading - Produced Water[2]					0.04						0.00			0.00
7E	VRU-1	VRU Compressor	0.81	1.62	393	0.55	0.18	0.002	0.06	0.005	0.000	0.001		0.002	0.065	0.10
8E	TEG-1	Thermoelectric Generator	0.01	0.00	7	0.00	0.00	0.000	0.00				0.00		0.000	0.00
12E	T01-T06	Condensate Tanks + Water Tanks[3]			28	1.14	8.03			0.00	0.00	0.01	0.24	0.01		0.26
9E	EC-1	Condensate Tanks + Water Tanks[1]	1.25	4.81	1956	0.07	0.43	0.00	0.07				0.01		0.001	0.02
10E	RBV-1	500 MBTU/hr Reboiler REMOVE														
11E	EC-2	Dehydration Unit Combustor MODIFY (FROM NEW DEHY)	0.78	2.28	1128.3	0.02	1.66	0.003	0.095	0.02			0.05	0.07	0.001	0.14
14E	RBV-2	Dehydration Unit Reboiler NEW	0.09	0.07	105.8	0.002	0.005	0.001	0.007				0.002		0.000	0.002
---	---	Truck Traffic Fugitive Dust							5.98							
---	---	Fugitive Emissions			40.65	1.63	1.78									0.018
Total (Exluding Fugitive Emissions)			11.79	12.90	13928.94	55.80	17.50	0.05	0.90	0.05	0.00	0.02	0.45	0.10	1.48	2.93
Total			11.79	12.90	13969.58	57.42	19.28	0.05	6.88	0.05	0.00	0.02	0.45	0.10	1.48	2.94
		Previous Emissions	5.67	12.96	7160.64	3.38	15.01	0.02	6.46	0.05	0.00	0.01	0.44	0.16	0.07	0.78
		Increase/Decrease	6.12	-0.06	6808.94	54.04	4.27	0.03	0.42	0.00	0.00	0.01	0.01	-0.06	1.41	2.16

[1] Condensate and water tank emissions are currently controlled by a VRU + Enclosed Combustor at 98%. This line represents the un-controlled 2%.

[2] Truck loading is un-controlled.

[3] This line represents the 2% Un-captured/Controlled associated with the VRU.

[4] VRU-1 and EC-1 would not run concurrent so hourly VOC emissions for these sources are only accounted for once.

Jay-Bee Oil &Gas ,LLC

ENGINE EMISSIONS

Moe Well Pad Production Facility
Tyler County, WV

Un-controlled Emissions

Source CE-1

Engine Data:

Engine Manufacturer	Caterpillar		
Engine Model	G3516 BLE		
Type (Rich-burn or Low Emission)	Lean		
Aspiration (Natural or Turbocharged)	Turbo		
Turbocharge Cooler Temperature	130	deg. F	
Manufacturer Rating	1,380	hp	
Speed at Above Rating	1,400	rpm	
Configeration (In-line or Vee)	In-Line		
Number of Cylinders	16		
Engine Bore	4.764	inches	Roger: Where do we find this?
Engine Stroke	5.984	inches	Roger: Where do we find this?
Fuel Heat Content (HHV)	1,263	BTU/scf	
Engine Displacement	1,707	cu. in.	
Fuel Consumption (HHV)	8,256	Btu/bhp-hr	

Emission Rates:	g/bhp-hr	lb/hr	tons/year	g/hr	lb/day	AP-42 4Stroke Lean lb/mmbtu	Comment
Oxides of Nitrogen, NOx	0.50	1.52	6.66	690	36.51		453.59 grams = 1 pound
Carbon Monoxide CO	2.43	7.39	32.38	3,353	177.43		2,000 pounds = 1 ton
VOC (NMNEHC)	0.92	2.80	12.26	1,270	67.18		
CO2e		1750.13	7665.57				
Total Annual Hours of Operation	**8,760**						
SO2		0.006699	0.0293			0.000588	
PM2.5		0.000878	0.0038			0.0000771	
PM		0.113819	0.4985			0.00999	
CO2	474	1442.09	6316.35				Mfg. Data
Methane	4.05	12.32	53.97				Mfg. Data
acrolein		0.058561	0.2565			0.00514	
acetaldehyde		0.095248	0.4172			0.00836	
formaldehyde	0.440	1.338624	5.8632			0.11749	Mfg. Data
benzene		0.005013	0.0220			0.00044	
ethylbenzene		0.000452	0.0020			0.0000397	
methanol		0.028483	0.1248			0.00250	
toluene		0.004648	0.0204			0.00041	
xylenes		0.002096	0.0092			0.00018	
n-Hexane		0.012647	0.0554			0.00111	
total HAPs		1.545774	6.7705			0.134566219	

Jay-Bee Oil &Gas ,LLC

ENGINE EMISSIONS

Moe Well Pad Production Facility
Tyler County, WV

Controlled Emissions

Source CE-1

Engine Data:

Engine Manufacturer	Caterpillar	
Engine Model	G3516 BLE	
Type (Rich-burn or Low Emission)	Lean	
Aspiration (Natural or Turbocharged)	Turbo	
Turbocharge Cooler Temperature	130	deg. F
Manufacturer Rating	1,380	hp
Speed at Above Rating	1,400	rpm
Configeration (In-line or Vee)	In-Line	
Number of Cylinders	16	
Engine Bore	4.764	inches
Engine Stroke	5.984	inches
Fuel Heat Content (HHV)	1,263	BTU/scf
Engine Displacement	1,707	cu. in.
Fuel Consumption (HHV)	8,256	Btu/bhp-hr

Emission Rates:	g/bhp-hr	lb/hr	tons/year	g/hr	lb/day	AP-42 4Stroke Lean lb/mmbtu	
Oxides of Nitrogen, NOx	0.50	1.52	6.66	690	36.51		Comment
Carbon Monoxide CO	0.17	0.52	2.27	235	12.42		453.59 grams = 1 pound
VOC (NMNEHC)	0.46	1.40	6.13	635	33.59		2,000 pounds = 1 ton
CO2e		1750.13	7665.57				
Total Annual Hours of Operation	**8,760**						
SO2		0.006699	0.0293			0.000588	Mfg. Data
PM2.5		0.000878	0.0038			0.0000771	
PM		0.113819	0.4985			0.00999	Mfg. Data
CO2	474	1442.09	6316.35				Mfg. Data
Methane	4.05	12.32	53.97				Mfg. Data
acrolein		0.058561	0.2565			0.00514	
acetaldehyde		0.095248	0.4172			0.00836	
formaldehyde	0.106	0.32127	1.4072			0.02820	Mfg. Data
benzene		0.005013	0.0220			0.00044	
ethylbenzene		0.000452	0.0020			0.0000397	
methanol		0.028483	0.1248			0.00250	
toluene		0.004648	0.0204			0.00041	
xylenes		0.002096	0.0092			0.00018	
n-Hexane		0.012647	0.0554			0.00111	
total HAPs		0.528419	2.3145			0.045270384	

Jay-Bee Oil &Gas ,LLC

Moe Well Pad Production Facility
Tyler County, WV

Controlled Emission Rates

Source VRU-1

Engine Data:

Engine Manufacturer	Cummins	
Engine Model	G5.9	
Type (Rich-burn or Low Emission)	Rich Burn	
Aspiration (Natural or Turbocharged)	Natural	
Manufacturer Rating	84	hp
Speed at Above Rating	1,800	rpm
Configuration (In-line or V)	In-line	
Number of Cylinders	6	
Engine Bore	4.020	inches
Engine Stroke	4.720	inches
Engine Displacement	359	cu. in.
Engine BMEP	103	psi
Fuel Consumption (HHV)	7,914	Btu/bhp-hr

Emission Rates:	g/bhp-hr	lb/hr	tpy	g/hr	lb/day	AP-42 4strokerich lb/MMBtu	
Oxides of Nitrogen, NOx	1.000	0.19	0.81	84	4.44		Comment
Carbon Monoxide CO	2.000	0.37	1.62	168	8.89		453.59 grams = 1 pound
VOC (NMNEHC)	0.220	0.04	0.18	18	0.98		2,000 pounds = 1 ton
CO2	449	83	364	37,716	1,996		
CO2e		90	393				
Total Annual Hours of Operation	**8,760**						
SO2		0.0004	0.0017			0.0006	
PM2.5		0.00632	0.0277			0.0095	
PM (Condensable)		0.00659	0.0289			0.00991	
CH_4		0.12623	0.5529			0.0022	Factor From 40 CFR 98, Table C-2
N_2O		0.01148	0.0503			0.0002	Factor From 40 CFR 98, Table C-2
acrolein		0.00175	0.0077			0.00263	
acetaldehyde		0.00185	0.0081			0.00279	
formaldehyde	0.080	0.0148	0.0649				Per Mfg.
benzene		0.00105	0.0046			0.00158	
toluene		0.00037	0.0016			0.000558	
ethylbenzene		1.6E-05	0.0001			0.0000248	
xylenes		0.00013	0.0006			0.000195	
methanol		0.00203	0.0089			0.00306	
Total HAPs		0.02202	0.0964				

Exhaust Parameters:

Exhaust Gas Temperature	1,078	deg. F
Exhaust Gas Mass Flow Rate		lb/hr
Exhaust Gas Mass Flow Rate	430	acfm
Exhaust Stack Height	96	inches
	8.00	feet
Exhaust Stack Inside Diameter	4	inches
	0.333	feet
Exhaust Stack Velocity	82.1	ft/sec
	4,927.4	ft/min

Jay-Bee Oil & Gas, Inc.

Moe Well Pad Production Facility
Tyler County, WV

Potential Emission Rates

Source HTR-1 Through HTR-3

*Emissions shown below are for each Gas Processing Unit

Burner Duty Rating	1500.0	Mbtu/hr
Burner Efficiency	98.0	%
Gas Heat Content (HHV)	1263.0	Btu/scf
Total Gas Consumption	29,084.8	scfd
H2S Concentration	0.000	Mole %
Hours of Operation	8760	

Average heating value of natural gas
1020 Btu/scf

NOx	0.1501	lb/hr	0.657	tpy
CO	0.1261	lb/hr	0.552	tpy
CO2	180.1	lb/hr	788.7	tpy
CH4	0.003	lb/hr	0.02	tpy
CO2e	181	lb/hr	793	tpy
VOC	0.0083	lb/hr	0.036	tpy
SO2	0.0009	lb/hr	0.004	tpy
H2S	0.0000	lb/hr	0.000	tpy
PM10	0.0114	lb/hr	0.050	tpy
CHOH	0.0001	lb/hr	0.000	tpy
Benzene	0.0000	lb/hr	0.000	tpy
N-Hexane	0.0027	lb/hr	0.012	tpy
Toluene	0.0000	lb/hr	0.000	tpy
Total HAPs	0.0028	lb/hr	0.012	tpy

AP-42 Factors Used

NOx	**100**	**lb/MMCF**	
CO	**84**	**lb/MMCF**	
CO_2	**120,000**	**lb/MMCF**	Global Warming Potential = 1
VOC	**5.5**	**lb/MMCF**	
PM	**7.6**	**lb/MMCF**	
SO_2	**0.6**	**lb/MMCF**	
CH_4	**2.3**	**lb/MMCF**	Global Warming Potential = 25
N_2O	**2.2**	**lb/MMCF**	Global Warming Potential =298
HCOH	**0.075**	**lb/MMCF**	
Benzene	**0.0021**	**lb/MMCF**	
n-Hexane	**1.8**	**lb/MMCF**	
Toluene	**0.0034**	**lb/MMCF**	

Jay-Bee Oil & Gas, Inc.

Moe Well Pad Production Facility
Tyler County, WV

Potential Emission Rates

Source HTR-4
Line Heater

Burner Duty Rating	500.0	Mbtu/hr
Burner Efficiency	98.0	%
Gas Heat Content (HHV)	1263.0	Btu/scf
Total Gas Consumption	9,694.9	scfd
H2S Concentration	0.000	Mole %
Hours of Operation	8760	

Average heating value of natural gas
1020 Btu/scf

NOx	0.0500	lb/hr	0.219	tpy
CO	0.0420	lb/hr	0.184	tpy
CO2	60.0	lb/hr	262.9	tpy
CH4	0.001	lb/hr	0.01	tpy
CO2e	60	lb/hr	264	tpy
VOC	0.0028	lb/hr	0.012	tpy
SO2	0.0003	lb/hr	0.001	tpy
H2S	0.0000	lb/hr	0.000	tpy
PM10	0.0038	lb/hr	0.017	tpy
CHOH	0.0000	lb/hr	0.000	tpy
Benzene	0.0000	lb/hr	0.000	tpy
N-Hexane	0.0009	lb/hr	0.004	tpy
Toluene	0.0000	lb/hr	0.000	tpy
Total HAPs	0.0009	lb/hr	0.004	tpy

AP-42 Factors Used

NOx	**100**	**lb/MMCF**	
CO	**84**	**lb/MMCF**	
CO_2	**120,000**	**lb/MMCF**	Global Warming Potential = 1
VOC	**5.5**	**lb/MMCF**	
PM	**7.6**	**lb/MMCF**	
SO_2	**0.6**	**lb/MMCF**	
CH_4	**2.3**	**lb/MMCF**	Global Warming Potential = 25
N_2O	**2.2**	**lb/MMCF**	Global Warming Potential =298
HCOH	**0.075**	**lb/MMCF**	
Benzene	**0.0021**	**lb/MMCF**	
n-Hexane	**1.8**	**lb/MMCF**	
Toluene	**0.0034**	**lb/MMCF**	

Jay-Bee Oil & Gas, Inc.

Moe Well Pad Production Facility
Tyler County, WV

Potential Emission Rates

Source TEG-1

Burner Duty Rating	13.0	MBtu/hr
Burner Efficiency	98.0	%
Gas Heat Content (HHV)	1263.0	Btu/scf
Total Gas Consumption	252.1	scfd
H2S Concentration	0.000	Mole %
Hours of Operation	8760	

Average heating value of natural gas

1020 Btu/scf Average heating value of natural gas

NOx	0.0013	lb/hr	0.006	tpy
CO	0.0011	lb/hr	0.005	tpy
CO2	1.6	lb/hr	6.8	tpy
CH4	0.000	lb/hr	0.00	tpy
CO2e	1.6	lb/hr	7	tpy
VOC	0.0001	lb/hr	0.000	tpy
SO2	0.0000	lb/hr	0.000	tpy
H2S	0.0000	lb/hr	0.000	tpy
PM10	0.0001	lb/hr	0.000	tpy
CHOH	0.0000	lb/hr	0.000	tpy
Benzene	0.0000	lb/hr	0.000	tpy
N-Hexane	0.0000	lb/hr	0.000	tpy
Toluene	0.0000	lb/hr	0.000	tpy
Total HAPs	0.0000	lb/hr	0.000	tpy

AP-42 Factors Used

NOx	**100**	**lb/MMCF**	
CO	**84**	**lb/MMCF**	
CO_2	**120,000**	**lb/MMCF**	Global Warming Potential = 1
VOC	**5.5**	**lb/MMCF**	
PM	**7.6**	**lb/MMCF**	
SO_2	**0.6**	**lb/MMCF**	
CH_4	**2.3**	**lb/MMCF**	Global Warming Potential = 25
N_2O	**2.2**	**lb/MMCF**	Global Warming Potential =298
HCOH	**0.075**	**lb/MMCF**	
Benzene	**0.0021**	**lb/MMCF**	
n-Hexane	**1.8**	**lb/MMCF**	
Toluene	**0.0034**	**lb/MMCF**	

Jay-Bee Oil & Gas, Inc.

Moe Well Pad Production Facility
Tyler County, WV

Potential Emission Rates

Source EC-1
Enclosed Combustor Pilot

Burner Duty Rating	985.1	MBtu/hr
Burner Efficiency	98.0	%
Gas Heat Content (HHV)	1263.0	Btu/scf
Total Gas Consumption	19100.9	scfd
H2S Concentration	0.000	Mole %
Hours of Operation	8760	

NOx	0.0985	lb/hr	0.432	tpy
CO	0.0828	lb/hr	0.363	tpy
CO2	118.3	lb/hr	518.0	tpy
CH4	0.002	lb/hr	0.01	tpy
CO2e	119	lb/hr	521	tpy
VOC	0.0054	lb/hr	0.024	tpy
SO2	0.0006	lb/hr	0.003	tpy
H2S	0.0000	lb/hr	0.000	tpy
PM10	0.0075	lb/hr	0.033	tpy
CHOH	0.0001	lb/hr	0.000	tpy
Benzene	0.0000	lb/hr	0.000	tpy
N-Hexane	0.0018	lb/hr	0.008	tpy
Toluene	0.0000	lb/hr	0.000	tpy
Total HAPs	0.0019	lb/hr	0.008	tpy

AP-42 Factors Used (Tables 1.4.1-1.4.3)

NOx	**100**	**lb/MMCF**	
CO	**84**	**lb/MMCF**	
CO_2	**120,000**	**lb/MMCF**	Global Warming Potential = 1
VOC	**5.5**	**lb/MMCF**	
PM	**7.6**	**lb/MMCF**	
SO_2	**0.6**	**lb/MMCF**	
CH_4	**2.3**	**lb/MMCF**	Global Warming Potential = 25
N_2O	**2.2**	**lb/MMCF**	Global Warming Potential =298
HCOH	**0.075**	**lb/MMCF**	
Benzene	**0.0021**	**lb/MMCF**	
n-Hexane	**1.8**	**lb/MMCF**	
Toluene	**0.0034**	**lb/MMCF**	

Jay-Bee Oil & Gas, Inc.

Moe Well Pad Production Facility
Tyler County, WV

Potential Emission Rates

Source EC-1
Enclosed Vapor Combustor - Control of Tank Emissions

Destruction Efficiency	98.0	%		
Gas Heat Content (HHV)	2313.1	Btu/scf		
Max Flow to T-E	0.028	MMSCFD	10.401	MMSCF/yr
Max BTUs to Flare	2.746	MMBTU/hr	24,058	MMBTU/yr

NOx	0.19	lb/hr	0.82	tpy
CO	1.02	lb/hr	4.45	tpy
CO2	321.02	lb/hr	1,406.07	tpy
CO2e	327.68	lb/hr	1,435.26	tpy
VOC	1.83	lb/hr	0.40	tpy
CH4	0.26	lb/hr	0.06	tpy
N2O	0.0006	lb/hr	0.0026	tpy
PM	0.0090	lb/hr	0.0395	tpy
CHOH	0.0001	lb/hr	0.0004	tpy
Benzene	0.0000	lb/hr	0.0000	tpy
n-Hexane	0.0021	lb/hr	0.0094	tpy
Toluene	0.0000	lb/hr	0.0000	tpy
Total HAP	0.0022	lb/hr	0.0098	tpy

Notes: VOC, Total HAP, N-Hexane and CH4 emissions are taken from the Condensate and Produced Water Tank Emissions

Factors Used

AP-42 Table 13.5-1	**NOx**	**0.068**	**lb/MMBTU**	
AP-42 Table 13.5-1	**CO**	**0.37**	**lb/MMBTU**	
40 CFR 98 Table C-1	**CO2**	**116.89**	**lb/MMBTU**	Global Warming Potential = 1
40 CFR 98 Table C-2	**CH4**	**0.0022**	**lb/MMBTU**	Global Warming Potential = 25
40 CFR 98 Table C-2	**N2O**	**0.00022**	**lb/MMBTU**	Global Warming Potential =298
AP-42 Table 1.4-2	**PM**	**7.6**	**lb/MMSCF**	
AP-42 Table 1.4-3	**Benzene**	**0.0021**	**lb/MMSCF**	
AP-42 Table 1.4-3	**Toluene**	**0.0034**	**lb/MMSCF**	
AP-42 Table 1.4-3	**Hexane**	**1.8**	**lb/MMSCF**	
AP-42 Table 1.4-3	**CHOH**	**0.075**	**lb/MMSCF**	

Jay-Bee Oil & Gas, Inc.

Moe Well Pad Production Facility
Tyler County, WV

Source RBV-2

Burner Duty Rating	200.0	MBtu/hr
Burner Efficiency	98.0	%
Gas Heat Content (HHV)	1263.0	Btu/scf
Total Gas Consumption	3,878	scfd
H2S Concentration	0.000	Mole %
Hours of Operation	8760	

NOx	0.0200	lb/hr	0.088	tpy
CO	0.0168	lb/hr	0.074	tpy
CO2	24.0	lb/hr	105.2	tpy
CH4	0.000	lb/hr	0.00	tpy
CO2e	24.2	lb/hr	105.8	tpy
VOC	0.0011	lb/hr	0.005	tpy
SO2	0.0001	lb/hr	0.001	tpy
H2S	0.0000	lb/hr	0.000	tpy
PM10	0.0015	lb/hr	0.007	tpy
CHOH	0.0000	lb/hr	0.000	tpy
Benzene	0.0000	lb/hr	0.000	tpy
N-Hexane	0.0004	lb/hr	0.002	tpy
Toluene	0.0000	lb/hr	0.000	tpy
Total HAPs	0.0004	lb/hr	0.002	tpy

AP-42 Factors Used

NOx	**100**	**lb/MMCF**	
CO	**84**	**lb/MMCF**	
CO_2	**120,000**	**lb/MMCF**	Global Warming Potential = 1
VOC	**5.5**	**lb/MMCF**	
PM	**7.6**	**lb/MMCF**	
SO_2	**0.6**	**lb/MMCF**	
CH_4	**2.3**	**lb/MMCF**	Global Warming Potential = 25
N_2O	**2.2**	**lb/MMCF**	Global Warming Potential = 298
HCOH	**0.075**	**lb/MMCF**	
Benzene	**0.0021**	**lb/MMCF**	
n-Hexane	**1.8**	**lb/MMCF**	
Toluene	**0.0034**	**lb/MMCF**	

Jay-Bee Oil & Gas, Inc.

Moe Well Pad Production Facility
Tyler County, WV

Potential Emission Rates

Source EC-2
Enclosed Combustor Pilot

Burner Duty Rating	985.1	MBtu/hr
Burner Efficiency	98.0	%
Gas Heat Content (HHV)	1263.0	Btu/scf
Total Gas Consumption	19100.9	scfd
H2S Concentration	0.000	Mole %
Hours of Operation	8760	

NOx	0.0985	lb/hr	0.432	tpy
CO	0.0828	lb/hr	0.363	tpy
CO2	118.3	lb/hr	518.0	tpy
CH4	0.002	lb/hr	0.01	tpy
CO2e	119	lb/hr	521	tpy
VOC	0.0054	lb/hr	0.024	tpy
SO2	0.0006	lb/hr	0.003	tpy
H2S	0.0000	lb/hr	0.000	tpy
PM10	0.0075	lb/hr	0.033	tpy
CHOH	0.0001	lb/hr	0.000	tpy
Benzene	0.0000	lb/hr	0.000	tpy
N-Hexane	0.0018	lb/hr	0.008	tpy
Toluene	0.0000	lb/hr	0.000	tpy
Total HAPs	0.0019	lb/hr	0.008	tpy

AP-42 Factors Used (Tables 1.4.1-1.4.3)

NOx	**100**	**lb/MMCF**	
CO	**84**	**lb/MMCF**	
CO_2	**120,000**	**lb/MMCF**	Global Warming Potential = 1
VOC	**5.5**	**lb/MMCF**	
PM	**7.6**	**lb/MMCF**	
SO_2	**0.6**	**lb/MMCF**	
CH_4	**2.3**	**lb/MMCF**	Global Warming Potential = 25
N_2O	**2.2**	**lb/MMCF**	Global Warming Potential =298
HCOH	**0.075**	**lb/MMCF**	
Benzene	**0.0021**	**lb/MMCF**	
n-Hexane	**1.8**	**lb/MMCF**	
Toluene	**0.0034**	**lb/MMCF**	

Jay-Bee Oil & Gas, Inc.

Moe Well Pad Production Facility
Tyler County, WV

Potential Emission Rates

Source EC-2
Enclosed Vapor Combustor

Destruction Efficiency	98.0	%		
Gas Heat Content (HHV)	633.6	Btu/scf		
Max Flow to T-E	0.04488	MMSCFD	393.149	MMSCF/yr
Max BTUs to Flare	1.18	MMBtu/hr	10,380	MMBtu/yr

NOx	0.08	lb/hr	0.35	tpy
CO	0.44	lb/hr	1.92	tpy
CO2	138.50	lb/hr	606.65	tpy
CO2e	138.65	lb/hr	607.27	tpy
VOC	0.37	lb/hr	1.64	tpy
CH4	0.00	lb/hr	0.0114	tpy
N2O	0.000	lb/hr	0.0011	tpy
PM	0.014	lb/hr	0.062	tpy
Benzene	0.005	lb/hr	0.020	tpy
CHOH	0.000	lb/hr	0.001	tpy
n-Hexane	0.009	lb/hr	0.040	tpy
Toluene	0.016	lb/hr	0.069	tpy
Total HAPs	0.030	lb/hr	0.130	tpy

Note: VOCs and HAPs are set at 2% of the still vent emissions in the Glycalc Report.

Factors Used

AP-42 Table 13.5-1	**NOx**	**0.068 lb/MMBTU**	
AP-42 Table 13.5-1	**CO**	**0.37 lb/MMBTU**	
40 CFR 98 Table C-1	**CO2**	**116.89 lb/MMBTU**	Global Warming Potential = 1
40 CFR 98 Table C-2	**CH4**	**0.0022 lb/MMBTU**	Global Warming Potential = 25
40 CFR 98 Table C-2	**N2O**	**0.00022 lb/MMBTU**	Global Warming Potential =298
AP-42 Table 1.4-2	**PM**	**7.6 lb/MMSCF**	
AP-42 Table 1.4-3	**CHOH**	**0.075 lb/MMSCF**	

Jay-Bee Oil & Gas, Inc.

Moe Well Pad Production Facility
Tyler County, WV

TL-1
Truck Loading - Condensate

Per AP-42, Chapter 5.2.2.1.1, the uncontrolled loading loss emission factor LL can be estimated as follows:

$$L_L = 12.46 * (SPM/T)$$

Where,

Loading Loss	L_L=	2.979	lb/1000 gallons
Saturation Factor	S=	0.6	
True Vapor Pressure	P=	3.1	psia
Molecular Weight of Vapors	M=	66.84	lb/lb-mol
Temperature	T=	520	deg R

Maximum Daily Loading	100	BBL/day
	4,200	gpd
Hours of Loading	3	hr

Total VOC	8.9	lb/day	2.96	lb/hr
Total HAP	0.5	lb/day	0.16	lb/hr

Maximum Annual Loading	20,400	BBL/yr
	856,800	gpy

Total VOC	1813.7	lb/yr	0.91	tpy
Total HAP	98.0	lb/yr	0.05	tpy

Emissions

Total VOC	71.059	%
Total HAP	3.841	%

Jay-Bee Oil & Gas, Inc.

Moe Well Pad Production Facility
Tyler County, WV

TL-2
Truck Loading - Produced Water

Per AP-42, Chapter 5.2.2.1.1, the uncontrolled loading loss emission factor LL can be estimated as follows:

$$L_L=12.46*(SPM/T)$$

Where,

Loading Loss	L_L=	0.132	lb/1000 gallons
Saturation Factor	S=	0.6	
True Vapor Pressure	P=	0.3	psia
Molecular Weight of Vapors	M=	30.68	lb/lb-mol
Temperature	T=	520	deg R

Maximum Daily Loading	120	BBL/day
	5,040	gpd
Hours of Loading	3	hr

Total VOC	0.2	lb/day	0.08	lb/hr
Total HAP	0.0	lb/day	0.009	lb/hr

Maximum Annual Loading	43,200	BBL/yr
	1,814,400	gpy

Total VOC	87.3	lb/yr	0.04	tpy
Total HAP	9.6	lb/yr	0.00	tpy

Emissions

Total VOC	36.376	%
Total HAP	4.009	%

Jay-Bee Oil & Gas, Inc.

Moe Well Pad Production Facility
Tyler County, WV

Truck Loading
Fugitive Dust

Item Number	Description	Number of Wheels	Mean Vehicle Weight (tons)	Mean Vehicle Speed (mph)	Miles per Trip	Maximum Trips per Hour	Truck Capacity (BBL/Truck)	Maximum Trips per Year	Control	Control Efficiency (%)
1	Produced Water Transportation Trucks	18	27	10	1.75	1	80	540	None	---
2	Condensate Transportation Trucks	18	27	10	1.75	1	80	255	None	---
			54000	lbs						

		PM	PM-10
k =	Particle size multiplier	0.8	0.36
s =	Silt content of road surface material (%)	10	3
S =	Mean vehicle speed (mph)	10	10
W =	Mean vehicle weight (tons)	27	27
w =	Mean number of wheels per vehicle	18	27
p =	Number of days per year with precipitation >0.01 in.	157	157

E (lb/ vehicle mile traveled) = $k \times 5.9 \times (s \div 12) \times (S \div 30) \times (W \div 3)^{0.7} \times (w \div 4)^{0.5} \times ((365 - p) \div 365)$

Item 1 - Produced Water		**PM**	**PM-10**	
E	lb/vmt	7.378804125	1.220015589	
E	[lb ÷ VMT] × [VMT ÷ trip] × [Trips ÷ Hour] = lb/hr	**12.913**	**2.135**	lb/hr
E	[lb ÷ VMT] × [VMT ÷ trip] × [Trips ÷ Hour] × [Ton ÷ 2000 lb] = t	**3.486**	**0.576**	tpy

Item 2 - Condensate		**PM**	**PM-10**	
E	lb/vmt	7.378804125	1.220015589	
E	[lb ÷ VMT] × [VMT ÷ trip] × [Trips ÷ Hour] = lb/hr	**12.913**	**2.135**	lb/hr
E	[lb ÷ VMT] × [VMT ÷ trip] × [Trips ÷ Hour] × [Ton ÷ 2000 lb] = t	**1.646**	**0.272**	tpy

Jay-Bee Oil & Gas - Moe

Flash Emission Calculations - Condensate

Using Gas-Oil Ratio Method

Un-Controlled

Site specific data

Gas-Oil-ratio	=	500	scf/bbl	Using GOW from comparable well pads.
Throughput	=	20,400	bbl/yr	
Stock tank gas molecular weight	=	39.56	g/mole	

Conversions

1 lb	=	453.6	g
1 mole	=	22.4	L
1 scf	=	28.32	L
1 ton	=	2000	lb

Equations

$$E_{TOT} = Q\frac{(bbl)}{(yr)} \times R\frac{(scf)}{(bbl)} \times \frac{28.32(L)}{1(scf)} \times \frac{1(mole)}{22.4(L)} \times MW\frac{(g)}{(mole)} \times \frac{1(lb)}{453.6(g)}) \times \frac{1(ton)}{2000(lb)}$$

E_{TOT} = Total stock tank flash emissions (TPY)

R = Measured gas-oil ratio (scf/bbl)

Q = Throughput (bbl/yr)

MW = Stock tank gas molecular weight (g/mole)

$$E_{spec} = E_{TOT} \times X_{spec}$$

E_{spec} = Flash emission from constituent

X_{spec} = Weight fraction of constituent in stock tank gas

Flash Emissions

Constituent	TPY	
Total	562.3396	E_{TOT}
VOC	**394.5881**	Sum of C3+
Nitrogen	1.41E-01	
Carbon Dioxide	8.83E-01	
Methane	5.58E+01	
Ethane	1.11E+02	
Propane	1.46E+02	
Isobutane	3.94E+01	
n-Butane	9.07E+01	
2,2 Dimethylpropane	1.11E+00	
Isopentane	3.10E+01	
n-Pentane	3.26E+01	
2,2 Dimethylbutane	1.18E+00	
Cyclopentane	0.00E+00	
2,3 Dimethylbutane	1.70E+00	
2 Methylpentane	9.04E+00	
3 Methylpentane	5.40E+00	
n-Hexane	1.18E+01	HAP
Methylcyclopentane	8.60E-01	
Benzene	2.02E-01	HAP
Cyclohexane	1.22E+00	
2-Methylhexane	2.62E+00	
3-Methylhexane	2.58E+00	
2,2,4 Trimethylpentane	0.00E+00	
Other C7's	2.45E+00	
n-Heptane	3.79E+00	
Methylcyclohexane	2.36E+00	
Toluene	4.61E-01	HAP
Other C8's	3.85E+00	
n-Octane	1.28E+00	
Ethylbenzene	2.81E-02	HAP
M & P Xylenes	3.32E-01	HAP
O-Xylene	4.50E-02	HAP
Other C9's	1.60E+00	
n-Nonane	3.82E-01	
Other C10's	6.02E-01	
n-Decane	7.87E-02	
Undecanes (11)	8.44E-02	

Jay-Bee Oil & Gas - Moe

Flash Emission Calculations - Produced Water

Using Gas-Water Ratio Method

Un-Controlled

Site specific data

Gas-Water-ratio	=	4.06	scf/bbl	Using GOW from comparable well pads.
Throughput	=	43,200	bbl/yr	
Stock tank gas molecular weight	=	30.68	g/mole	

Conversions

1 lb	=	453.6	g
1 mole	=	22.4	L
1 scf	=	28.32	L
1 ton	=	2000	lb

Equations

$$E_{TOT} = Q\frac{(bbl)}{(yr)} \times R\frac{(scf)}{(bbl)} \times \frac{28.32(L)}{1(scf)} \times \frac{1(mole)}{22.4(L)} \times MW\frac{(g)}{(mole)} \times \frac{1(lb)}{453.6(g)}) \times \frac{1(ton)}{2000(lb)}$$

E_{TOT} = Total stock tank flash emissions (TPY)

R = Measured gas-oil ratio (scf/bbl)

Q = Throughput (bbl/yr)

MW = Stock tank gas molecular weight (g/mole)

$$E_{spec} = E_{TOT} \times X_{spec}$$

E_{spec} = Flash emission from constituent

X_{spec} = Weight fraction of constituent in stock tank gas

Flash Emissions

Constituent	TPY	
Total	7.4991	E_{TOT}
VOC	**3.8354**	Sum of C3+
Nitrogen	1.25E-01	
Carbon Dioxide	1.13E-01	
Methane	2.22E+00	
Ethane	1.21E+00	
Propane	8.62E-01	
Isobutane	2.15E-01	
n-Butane	6.07E-01	
2,2 Dimethylpropane	9.52E-03	
Isopentane	3.05E-01	
n-Pentane	4.24E-01	
2,2 Dimethylbutane	1.58E-02	
Cyclopentane	0.00E+00	
2,3 Dimethylbutane	3.05E-02	
2 Methylpentane	1.70E-01	
3 Methylpentane	1.10E-01	
n-Hexane	2.96E-01	HAP
Methylcyclopentane	2.76E-02	
Benzene	5.40E-03	HAP
Cyclohexane	3.80E-02	
2-Methylhexane	8.26E-02	
3-Methylhexane	8.59E-02	
2,2,4 Trimethylpentane	0.00E+00	
Other C7's	7.90E-02	
n-Heptane	1.44E-01	
Methylcyclohexane	7.63E-02	
Toluene	1.18E-02	HAP
Other C8's	1.31E-01	
n-Octane	4.11E-02	
Ethylbenzene	8.25E-04	HAP
M & P Xylenes	6.75E-03	HAP
O-Xylene	7.50E-04	HAP
Other C9's	3.97E-02	
n-Nonane	7.42E-03	
Other C10's	8.70E-03	
n-Decane	1.50E-03	
Undecanes (11)	1.42E-03	

Jay-Bee Oil & Gas, Inc.

Moe Well Pad Production Facility
Tyler County, WV

Fugitive VOC Emissions

Volatile Organic Compounds, NMNEHC from gas analysis:	18.40	weight percent
Methane from gas analysis:	59.35	weight percent
Carbon Dioxide from gas analysis:	0.32	weight percent
HAPs from gas analysis:		
Hexane	0.62	weight percent
Gas Density:	0.0580	lb/scf

Emission Source:	Count	Oil & Gas Production*	VOC %	VOC (lb/hr)	VOC (tpy)	CO2 (lb/hr)	CO2 (tpy)	CH4 (lb/hr)	CH4 (tpy)	CO2e (tpy)	Hexane (tpy)
Pump Seals:											
Gas:	1	0.00529 lb/hr	18.4	0.001	0.004	0.000	0.000	0.003	0.0138	0.344	0.000
Valves:											
Gas/Vapor:	38	0.02700 scf/hr	18.4	0.011	0.048	0.000	0.001	0.035	0.1546	3.867	0.002
Light Liquid:	18	0.05000 scf/hr	100.0	0.052	0.229						
Low Bleed Pneumatic	-	1.39000 scf/hr	18.4	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000
Relief Valves:	3	0.04000 scf/hr	18.4	0.001	0.006	0.000	0.000	0.004	0.0181	0.452	0.000
Open-ended Lines, gas:	20	0.06100 scf/hr	18.4	0.013	0.057	0.000	0.001	0.042	0.1839	4.598	0.002
Sampling Connectors:											
Gas:	11	0.03300 lb/hr	18.4	0.067	0.293	0.001	0.005	0.215	0.9436	23.595	0.010
Light Liquid:	6	0.03300 lb/hr	100.0	0.198	0.867						
Connectors:											
Gas:	177	0.00300 scf/hr	18.4	0.006	0.025	0.000	0.000	0.018	0.0800	2.001	0.001
Light Liquid:	60	0.00700 scf/hr	100.0	0.024	0.107						
Compressor Seals, Gas:	1	0.01940 lb/hr	18.4	0.004	0.016	0.000	0.000	0.012	0.0504	1.261	0.001
Flanges:											
Gas:	80	0.00086 lb/hr	18.4	0.013	0.055	0.000	0.001	0.041	0.1788	4.472	0.002
Light Liquid:	40	0.00300 scf/hr	100.0	0.007	0.030						

Blowdowns:

	Pressure (psig)	Internal Volume (scf)	Projected Blowdown Events (per year)	Gas Released Per Year (scf)	Gas Released Per Year (lbs)	Composition of Gas (% by volume)	Released (lb/hr)	Released (tpy)	CO2e (tpy)
VOC	300	65	16	1040	124.8	0.70	0.0100	0.0438	
CH4	300	65	16	1040	44.0	0.10	0.0005	0.0022	0.0546
HAPs	300	65	16	1040	116.3	0.02	0.0003	0.0013	

Fugitive Calculations:

	lb/hr	tpy
VOC	**0.406**	**1.780**
CH4	**0.371**	**1.625**
CO2	**0.002**	**0.009**
CO2e	**9.280**	**40.645**
HAPs	**0.004**	**0.018**

Notes:
Factors are from 40 CFR 98, Table W-1A (scf/hr), where available. Remaining are API (lb/hr)
Sampling Connectors are from TECQ. Remaining are API (lb/hr)

Jay-Bee Oil & Gas, Inc.

Moe Well Pad Production Facility
Tyler County, WV

Inlet Gas Composition Information:

	Fuel Gas mole %	Fuel M.W. lb/lb-mole	Fuel S.G.	Fuel Wt. %	LHV, dry Btu/scf	HHV, dry Btu/scf	AFR vol/vol	VOC NM / NE	Z Factor	GPM
Nitrogen, N2	0.394	0.110	0.004	0.530			-		0.0039	
Carbon Dioxide, CO2	0.151	0.066	0.002	0.319			-		0.0015	
Hydrogen Sulfide, H2S	-	-	-	-			-		-	
Helium, He	-	-	-	-			-		-	
Oxygen, O2	-	-	-	-			-		-	
Methane, CH4	77.080	12.366	0.427	59.347	701.0	778.5	7.346		0.7693	
Ethane, C2H6	14.832	4.460	0.154	21.405	240.1	262.5	2.474		0.1471	3.945
Propane	4.967	2.190	0.076	10.512	115.0	125.0	1.183	10.512	0.0488	1.361
Iso-Butane	0.616	0.358	0.012	1.718	18.5	20.0	0.191	1.718	0.0060	0.200
Normal Butane	1.210	0.703	0.024	3.375	36.4	39.5	0.375	3.375	0.0117	0.379
Iso Pentane	0.266	0.192	0.007	0.921	9.8	10.6	0.101	0.921	0.0027	0.097
Normal Pentane	0.262	0.189	0.007	0.907	9.7	10.5	0.100	0.907	0.0026	0.094
Hexane	0.151	0.130	0.004	0.625	6.6	7.2	0.068	0.625	0.0015	0.062
Heptane	0.071	0.071	0.002	0.341	3.6	3.9	0.037	0.341	0.0007	0.033
	100.000	20.837	0.719		1,140.8	1,257.7	11.875	18.400	0.9958	6.172

Gas Density (STP) = 0.058

Ideal Gross (HHV)	1,257.7
Ideal Gross (sat'd)	1,236.6
GPM	-
Real Gross (HHV)	1,263.0
Real Net (LHV)	1,145.6

Jay-Bee Oil & Gas, Inc.

Moe Well Pad Production Facility
Tyler County, WV

Condensate Tank Flash Vapor Composition Information:

	Fuel Gas mole %	Fuel M.W. lb/lb-mole	Fuel S.G.	Fuel Wt. %	LHV, dry Btu/scf	HHV, dry Btu/scf	AFR vol/vol	VOC NM / NE	Z Factor	GPM
Nitrogen, N2	0.036	0.009	0.000	0.022			-		0.0003	
Carbon Dioxide, CO2	0.141	0.041	0.001	0.103			-		0.0009	
Hydrogen Sulfide, H2S	-	0.000	0.000	0.000	0.0	0.0	0.000		0.0000	
Helium, He	-	-	-	-			-		-	
Oxygen, O2	-	-	-	-			-		-	
Methane, CH4	24.485	3.370	0.116	8.458	191.0	212.2	2.002		0.2096	
Ethane, C2H6	25.943	8.112	0.280	20.358	436.7	477.4	4.500		0.2676	7.176
Propane	23.253	11.311	0.391	28.386	593.8	645.4	6.110	28.386	0.2520	7.030
Iso-Butane	4.773	3.064	0.106	7.690	158.2	171.4	1.633	7.690	0.0512	1.715
Normal Butane	10.980	6.916	0.239	17.357	358.3	388.2	3.685	17.357	0.1150	3.731
Iso Pentane	3.135	2.367	0.082	5.941	121.4	131.3	1.250	5.941	0.0328	1.195
Normal Pentane	3.175	2.307	0.080	5.791	118.5	128.2	1.219	5.791	0.0320	1.152
Hexane	2.378	1.531	0.053	3.841	78.2	84.5	0.804	3.841	0.0175	0.726
Heptane	1.701	0.818	0.028	2.052	41.6	44.9	0.428	2.052	0.0081	0.374
	100.000	39.846	1.376		2,097.7	2,283.4	21.630	71.059	0.9872	23.100

Gas Density (STP) = 0.111

Ideal Gross (HHV)	2,283.4
Ideal Gross (sat'd)	2,244.3
GPM	-
Real Gross (HHV)	2,313.1
Real Net (LHV)	2,124.9

Jay-Bee Oil & Gas, Inc.

Moe Well Pad Production Facility
Tyler County, WV

Water Tank Flash Vapor Composition Information:

	Fuel Gas mole %	Fuel M.W. lb/lb-mole	Fuel S.G.	Fuel Wt. %	LHV, dry Btu/scf	HHV, dry Btu/scf	AFR vol/vol	VOC NM / NE	Z Factor	GPM
Nitrogen, N2	1.821	0.161	0.006	0.652			-		0.0057	
Carbon Dioxide, CO2	1.049	0.705	0.024	2.855			-		0.0160	
Hydrogen Sulfide, H2S	-	0.000	0.000	0.000	0.0	0.0	0.000		0.0000	
Helium, He	-	-	-	-			-		-	
Oxygen, O2	-	-	-	-			-		-	
Methane, CH4	56.602	11.902	0.411	48.188	674.7	749.3	7.070		0.7404	
Ethane, C2H6	16.424	2.946	0.102	11.929	158.6	173.4	1.634		0.0972	2.606
Propane	8.000	1.933	0.067	7.827	101.5	110.3	1.044	7.827	0.0431	1.202
Iso-Butane	1.516	1.070	0.037	4.332	55.2	59.9	0.570	4.332	0.0179	0.599
Normal Butane	4.274	1.187	0.041	4.808	61.5	66.6	0.633	4.808	0.0197	0.641
Iso Pentane	1.784	0.942	0.033	3.812	48.3	52.2	0.497	3.812	0.0131	0.475
Normal Pentane	2.405	0.670	0.023	2.711	34.4	37.2	0.354	2.711	0.0093	0.334
Hexane	2.953	0.990	0.034	4.009	50.6	54.6	0.520	4.009	0.0114	0.470
Heptane	3.172	2.192	0.076	8.877	111.6	120.4	1.147	8.877	0.0218	1.004
	100.000	24.699	0.853		1,296.4	1,424.0	13.469	36.376	0.9954	7.331

Gas Density (STP) = 0.069

Ideal Gross (HHV)	1,424.0
Ideal Gross (sat'd)	1,399.9
GPM	-
Real Gross (HHV)	1,430.5
Real Net (LHV)	1,302.3

Jay-Bee Oil & Gas, Inc.

Moe Well Pad Production Facility
Tyler County, WV

Still Vent Gas Composition Information:

	Fuel Gas mole %	Fuel M.W. lb/lb-mole	Fuel S.G.	Fuel Wt. %	LHV, dry Btu/scf	HHV, dry Btu/scf	AFR vol/vol	VOC NM / NE	Z Factor	GPM
Nitrogen, N2	0.152	0.043	0.001	0.204	0.0	0.0	-		0.0015	
Carbon Dioxide, CO2	0.158	0.070	0.002	0.333	0.0	0.0	0.011		0.0016	
Hydrogen Sulfide, H2S	-	-	-	-	0.0	0.0	-		-	
Water	56.500	10.170	0.351	48.743	0.0	0.0	-		0.5653	
Oxygen, O2	-	-	-	-	0.0	0.0	-		-	
Methane, CH4	29.500	4.733	0.163	22.683	268.3	298.0	4.921		0.2944	
Ethane, C2H6	7.390	2.222	0.077	10.650	119.6	130.8	1.760		0.0733	1.966
Propane	3.180	1.402	0.048	6.721	73.6	80.0	0.985	6.721	0.0312	0.872
Iso-Butane	0.488	0.284	0.010	1.359	14.6	15.9	0.151	1.359	0.0047	0.159
Normal Butane	1.150	0.668	0.023	3.204	34.6	37.5	0.438	3.204	0.0111	0.361
Iso Pentane	0.267	0.193	0.007	0.923	9.9	10.7	0.113	0.923	0.0027	0.097
Normal Pentane	0.316	0.228	0.008	1.093	11.7	12.7	0.133	1.093	0.0032	0.114
Hexane	0.342	0.294	0.010	1.411	15.0	16.2	0.197	1.411	0.0034	0.140
Heptane	0.557	0.558	0.019	2.675	28.4	30.6	1.310	2.675	0.0055	0.256
	100.000	20.864	0.720		575.8	632.4	10.019	17.386	0.9980	3.963

Gas Density (STP) = 0.058

Ideal Gross (HHV)	632.4
Ideal Gross (sat'd)	622.2
GPM	-
Real Gross (HHV)	633.6
Real Net (LHV)	577.0

Jay-Bee Oil & Gas, Inc.

Specific Gravity of Air, @ 29.92 in. Hg and 60 -F, 28.9625
One mole of gas occupies, @ 14.696 psia & 32 -F, 359.2 cu ft. per lb-mole
One mole of gas occupies, @ 14.696 psia & 60 -F, 379.64 cu ft. per lb-mole

Hydrogen Sulfide (H2S) conversion chart:

0 grains H2S/100 scf	=	0.00000 mole % H2S
		0.0 ppmv H2S
0 mole % H2S	=	0 grains H2S/100 scf
		0.0 ppmv H2S
0 ppmv H2S	=	0.000 grains H2S/100 scf
		0.00000 mole % H2S

Ideal Gas at 14.696 psia and 60°F

		MW lb/mol	Specific Gravity	Lb per Cu Ft	Cu Ft per Lb	LHV, dry Btu/scf	HHV, dry Btu/scf	LHV Btu/lb	HHV Btu/lb	cu ft of air / 1 cu ft of gas	Z factor
Nitrogen	N2	28.013	0.9672	0.0738	13.552	0	0	0	0	0	0.9997
Carbon Dioxide	CO2	44.010	1.5196	0.1159	8.626	0	0	0	0	0	0.9964
Hydrogen Sulfide	H2S	34.076	1.1766	0.0898	11.141	587	637	6,545	7,100	7.15	0.9846
Water	H20	18.000	0.6215	0.0474	21.091	0	0	0	0	0	1.0006
Oxygen	O2	31.999	1.1048	0.0843	11.864	0	0	0	0	0	0.9992
Methane	CH4	16.043	0.5539	0.0423	23.664	909.4	1,010.0	21,520	23,879	9.53	0.9980
Ethane	C2H6	30.070	1.0382	0.0792	12.625	1,618.7	1,769.6	20,432	22,320	16.68	0.9919
Propane	C3H8	44.097	1.5226	0.1162	8.609	2,314.9	2,516.1	19,944	21,661	23.82	0.9825
Iso-Butane	C4H10	58.124	2.0069	0.1531	6.532	3,000.4	3,251.9	19,629	21,257	30.97	0.9711
Normal Butane	C4H10	58.124	2.0069	0.1531	6.532	3,010.8	3,262.3	19,680	21,308	30.97	0.9667
Iso Pentane	C5H12	72.151	2.4912	0.1901	5.262	3,699.0	4,000.9	19,478	21,052	38.11	1.0000
Normal Pentane	C5H12	72.151	2.4912	0.1901	5.262	3,706.9	4,008.9	19,517	21,091	38.11	1.0000
Hexane	C6H14	86.178	2.9755	0.2270	4.405	4,403.8	4,755.9	19,403	20,940	45.26	0.9879
Heptane	C7H16	100.205	3.4598	0.2639	3.789	5,100.0	5,502.5	22,000	23,000	52.41	0.9947

Real Gas at 14.696 psia and 60°F

		MW lb/mol	Specific Gravity	Lb per Cu Ft	Cu Ft per Lb	LHV, dry Btu/scf	HHV, dry Btu/scf	LHV Btu/lb	HHV Btu/lb	cu ft of air / 1 cu ft of gas	Gal/Mole
Nitrogen	N2	28.013	0.9672	0.0738	13.552	0	0	0	0	0	4.1513
Carbon Dioxide	CO2	44.010	1.5196	0.1159	8.626	0	0	0	0	0	6.4532
Hydrogen Sulfide	H2S	34.076	1.1766	0.0898	11.141	621	672	6,545	7,100	7.15	5.1005
Water	H2O	18.000	0.6215	0.0474	21.091						3.8376
Oxygen	O2	31.999	1.1048	0.0843	11.864	0	0	0	0	0	3.3605
Methane	CH4	16.043	0.5539	0.0423	23.664	911	1,012	21,520	23,879	9.53	6.4172
Ethane	C2H6	30.070	1.0382	0.0792	12.625	1,631	1,783	20,432	22,320	16.68	10.126
Propane	C3H8	44.097	1.5226	0.1162	8.609	2,353	3,354	19,944	21,661	23.82	10.433
Iso-Butane	C4H10	58.124	2.0069	0.1531	6.532	3,101	3,369	19,629	21,257	30.97	12.386
Normal Butane	C4H10	58.124	2.0069	0.1531	6.532	3,094	3,370	19,680	21,308	30.97	11.937
Iso Pentane	C5H12	72.151	2.4912	0.1901	5.262	3,709	4,001	19,478	21,052	38.11	13.86
Normal Pentane	C5H12	72.151	2.4912	0.1901	5.262	3,698	4,009	19,517	21,091	38.11	13.713
Hexane	C6H14	86.178	2.9755	0.2270	4.405	4,404	4,756	19,403	20,940	45.26	15.566
Heptane	C7H16	100.205	3.4598	0.2639	3.789	5,101	5,503	22,000	23,000	52.41	17.468

GRI-GLYCalc VERSION 4.0 - SUMMARY OF INPUT VALUES

Case Name: Moe Well Pad
File Name: C:\Rogers_Files\Misc\Jay-Bee Oil & Gas\Moe\Moe 20 MMSCFD No Cond 11-15-16.ddf
Date: November 15, 2016

DESCRIPTION:

Description: 20 MMSCFD
Still Vent to Combustor
No Flash Tank

Annual Hours of Operation: 8760.0 hours/yr

WET GAS:

Temperature: 85.00 deg. F
Pressure: 500.00 psig
Wet Gas Water Content: Saturated

Component	Conc. (vol %)
Carbon Dioxide	0.1510
Nitrogen	0.3940
Methane	77.0800
Ethane	14.8320
Propane	4.9670
Isobutane	0.6160
n-Butane	1.2100
Isopentane	0.2660
n-Pentane	0.2620
n-Hexane	0.0580
Cyclohexane	0.0060
Other Hexanes	0.0930
Heptanes	0.0420
Benzene	0.0010
Toluene	0.0020
C8+ Heavies	0.0200

DRY GAS:

Flow Rate: 20.0 MMSCF/day
Water Content: 7.0 lbs. H2O/MMSCF

LEAN GLYCOL:

Glycol Type: TEG
Water Content: 1.5 wt% H2O
Flow Rate: 3.5 gpm

PUMP:

Glycol Pump Type: Gas Injection
Gas Injection Pump Volume Ratio: 0.080 acfm gas/gpm glycol

REGENERATOR OVERHEADS CONTROL DEVICE:

Control Device:	Combustion Device
Destruction Efficiency:	98.0 %
Excess Oxygen:	5.0 %
Ambient Air Temperature:	60.0 deg. F

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: Moe Well Pad
File Name: C:\Rogers_Files\Misc\Jay-Bee Oil & Gas\Moe\Moe 20 MMSCFD No Cond 11-15-16.ddf
Date: November 15, 2016

DESCRIPTION:

Description: 20 MMSCFD
Still Vent to Combustor
No Flash Tank

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

CONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.4665	11.196	2.0432
Ethane	0.2192	5.260	0.9599
Propane	0.1384	3.322	0.6063
Isobutane	0.0279	0.671	0.1224
n-Butane	0.0659	1.581	0.2885
Isopentane	0.0190	0.456	0.0832
n-Pentane	0.0224	0.539	0.0983
n-Hexane	0.0092	0.221	0.0403
Cyclohexane	0.0035	0.084	0.0154
Other Hexanes	0.0117	0.281	0.0512
Heptanes	0.0141	0.339	0.0620
Benzene	0.0046	0.109	0.0200
Toluene	0.0158	0.380	0.0693
C8+ Heavies	0.0416	0.997	0.1820
Total Emissions	1.0598	25.435	4.6419
Total Hydrocarbon Emissions	1.0598	25.435	4.6419
Total VOC Emissions	0.3742	8.980	1.6388
Total HAP Emissions	0.0296	0.710	0.1295
Total BTEX Emissions	0.0204	0.489	0.0892

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	23.3242	559.781	102.1601
Ethane	10.9577	262.986	47.9949
Propane	6.9210	166.104	30.3139
Isobutane	1.3969	33.525	6.1183
n-Butane	3.2938	79.050	14.4266
Isopentane	0.9498	22.794	4.1599
n-Pentane	1.1224	26.937	4.9160
n-Hexane	0.4596	11.031	2.0132
Cyclohexane	0.1757	4.216	0.7694
Other Hexanes	0.5848	14.035	2.5613
Heptanes	0.7072	16.974	3.0977
Benzene	0.2280	5.471	0.9985
Toluene	0.7908	18.978	3.4635
C8+ Heavies	2.0781	49.875	9.1021

Total Emissions	52.9898	1271.756	232.0955
Total Hydrocarbon Emissions	52.9898	1271.756	232.0955
Total VOC Emissions	18.7079	448.989	81.9405
Total HAP Emissions	1.4784	35.481	6.4752
Total BTEX Emissions	1.0187	24.449	4.4620

EQUIPMENT REPORTS:

COMBUSTION DEVICE

Ambient Temperature:	60.00 deg. F
Excess Oxygen:	5.00 %
Combustion Efficiency:	98.00 %
Supplemental Fuel Requirement:	2.58e-001 MM BTU/hr

Component	Emitted	Destroyed
Methane	2.00%	98.00%
Ethane	2.00%	98.00%
Propane	2.00%	98.00%
Isobutane	2.00%	98.00%
n-Butane	2.00%	98.00%
Isopentane	2.00%	98.00%
n-Pentane	2.00%	98.00%
n-Hexane	2.00%	98.00%
Cyclohexane	2.00%	98.00%
Other Hexanes	2.00%	98.00%
Heptanes	2.00%	98.00%
Benzene	2.00%	98.00%
Toluene	2.00%	98.00%
C8+ Heavies	2.00%	98.00%

ABSORBER

NOTE: Because the Calculated Absorber Stages was below the minimum allowed, GRI-GLYCalc has set the number of Absorber Stages to 1.25 and has calculated a revised Dry Gas Dew Point.

Calculated Absorber Stages:	1.25
Calculated Dry Gas Dew Point:	3.66 lbs. H2O/MMSCF
Temperature:	85.0 deg. F
Pressure:	500.0 psig
Dry Gas Flow Rate:	20.0000 MMSCF/day
Glycol Losses with Dry Gas:	0.0737 lb/hr
Wet Gas Water Content:	Saturated
Calculated Wet Gas Water Content:	63.67 lbs. H2O/MMSCF
Calculated Lean Glycol Recirc. Ratio:	4.20 gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	5.74%	94.26%
Carbon Dioxide	99.84%	0.16%
Nitrogen	99.99%	0.01%
Methane	99.99%	0.01%

Ethane	99.96%	0.04%
Propane	99.93%	0.07%
Isobutane	99.90%	0.10%
n-Butane	99.86%	0.14%
Isopentane	99.85%	0.15%
n-Pentane	99.81%	0.19%
n-Hexane	99.66%	0.34%
Cyclohexane	98.49%	1.51%
Other Hexanes	99.74%	0.26%
Heptanes	99.31%	0.69%
Benzene	86.79%	13.21%
Toluene	80.54%	19.46%
C8+ Heavies	97.30%	2.70%

REGENERATOR

No Stripping Gas used in regenerator.

Component	Remaining in Glycol	Distilled Overhead
Water	37.09%	62.91%
Carbon Dioxide	0.00%	100.00%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%
Propane	0.00%	100.00%
Isobutane	0.00%	100.00%
n-Butane	0.00%	100.00%
Isopentane	0.33%	99.67%
n-Pentane	0.36%	99.64%
n-Hexane	0.41%	99.59%
Cyclohexane	3.05%	96.95%
Other Hexanes	0.77%	99.23%
Heptanes	0.45%	99.55%
Benzene	4.97%	95.03%
Toluene	7.88%	92.12%
C8+ Heavies	11.75%	88.25%

STREAM REPORTS:

WET GAS STREAM

Temperature: 85.00 deg. F
Pressure: 514.70 psia
Flow Rate: 8.35e+005 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.34e-001	5.31e+001
Carbon Dioxide	1.51e-001	1.46e+002
Nitrogen	3.93e-001	2.42e+002
Methane	7.70e+001	2.72e+004
Ethane	1.48e+001	9.80e+003

Propane	4.96e+000	4.81e+003
Isobutane	6.15e-001	7.86e+002
n-Butane	1.21e+000	1.54e+003
Isopentane	2.66e-001	4.22e+002
n-Pentane	2.62e-001	4.15e+002
n-Hexane	5.79e-002	1.10e+002
Cyclohexane	5.99e-003	1.11e+001
Other Hexanes	9.29e-002	1.76e+002
Heptanes	4.19e-002	9.25e+001
Benzene	9.99e-004	1.72e+000
Toluene	2.00e-003	4.05e+000
C8+ Heavies	2.00e-002	7.48e+001
Total Components	100.00	4.58e+004

DRY GAS STREAM

Temperature: 85.00 deg. F
Pressure: 514.70 psia
Flow Rate: 8.33e+005 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	7.72e-003	3.05e+000
Carbon Dioxide	1.51e-001	1.46e+002
Nitrogen	3.94e-001	2.42e+002
Methane	7.71e+001	2.72e+004
Ethane	1.48e+001	9.79e+003
Propane	4.96e+000	4.81e+003
Isobutane	6.15e-001	7.86e+002
n-Butane	1.21e+000	1.54e+003
Isopentane	2.66e-001	4.21e+002
n-Pentane	2.62e-001	4.14e+002
n-Hexane	5.78e-002	1.09e+002
Cyclohexane	5.91e-003	1.09e+001
Other Hexanes	9.28e-002	1.76e+002
Heptanes	4.17e-002	9.18e+001
Benzene	8.68e-004	1.49e+000
Toluene	1.61e-003	3.26e+000
C8+ Heavies	1.95e-002	7.28e+001
Total Components	100.00	4.58e+004

LEAN GLYCOL STREAM

Temperature: 85.00 deg. F
Flow Rate: 3.50e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.85e+001	1.94e+003
Water	1.50e+000	2.96e+001
Carbon Dioxide	1.18e-012	2.32e-011
Nitrogen	1.35e-013	2.65e-012
Methane	4.77e-018	9.40e-017
Ethane	8.51e-008	1.68e-006
Propane	6.78e-009	1.34e-007
Isobutane	1.22e-009	2.41e-008
n-Butane	2.68e-009	5.27e-008

Isopentane	1.61e-004	3.17e-003
n-Pentane	2.06e-004	4.06e-003
n-Hexane	9.61e-005	1.89e-003
Cyclohexane	2.81e-004	5.53e-003
Other Hexanes	2.32e-004	4.56e-003
Heptanes	1.63e-004	3.20e-003
Benzene	6.06e-004	1.19e-002
Toluene	3.43e-003	6.76e-002
C8+ Heavies	1.40e-002	2.77e-001
Total Components	100.00	1.97e+003

RICH GLYCOL AND PUMP GAS STREAM

Temperature: 85.00 deg. F
Pressure: 514.70 psia
Flow Rate: 3.72e+000 gpm
NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.36e+001	1.94e+003
Water	3.84e+000	7.97e+001
Carbon Dioxide	1.65e-002	3.42e-001
Nitrogen	1.01e-002	2.10e-001
Methane	1.13e+000	2.33e+001
Ethane	5.29e-001	1.10e+001
Propane	3.34e-001	6.92e+000
Isobutane	6.74e-002	1.40e+000
n-Butane	1.59e-001	3.29e+000
Isopentane	4.60e-002	9.53e-001
n-Pentane	5.43e-002	1.13e+000
n-Hexane	2.23e-002	4.62e-001
Cyclohexane	8.74e-003	1.81e-001
Other Hexanes	2.84e-002	5.89e-001
Heptanes	3.43e-002	7.10e-001
Benzene	1.16e-002	2.40e-001
Toluene	4.14e-002	8.58e-001
C8+ Heavies	1.14e-001	2.35e+000
Total Components	100.00	2.07e+003

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
Pressure: 14.70 psia
Flow Rate: 1.87e+003 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	5.65e+001	5.01e+001
Carbon Dioxide	1.58e-001	3.42e-001
Nitrogen	1.52e-001	2.10e-001
Methane	2.95e+001	2.33e+001
Ethane	7.39e+000	1.10e+001
Propane	3.18e+000	6.92e+000
Isobutane	4.88e-001	1.40e+000
n-Butane	1.15e+000	3.29e+000
Isopentane	2.67e-001	9.50e-001

n-Pentane	3.16e-001	1.12e+000
n-Hexane	1.08e-001	4.60e-001
Cyclohexane	4.24e-002	1.76e-001
Other Hexanes	1.38e-001	5.85e-001
Heptanes	1.43e-001	7.07e-001
Benzene	5.92e-002	2.28e-001
Toluene	1.74e-001	7.91e-001
C8+ Heavies	2.48e-001	2.08e+000
Total Components	100.00	1.04e+002

COMBUSTION DEVICE OFF GAS STREAM

Temperature: 1000.00 deg. F
Pressure: 14.70 psia
Flow Rate: 1.62e+001 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Methane	6.83e+001	4.66e-001
Ethane	1.71e+001	2.19e-001
Propane	7.37e+000	1.38e-001
Isobutane	1.13e+000	2.79e-002
n-Butane	2.66e+000	6.59e-002
Isopentane	6.18e-001	1.90e-002
n-Pentane	7.30e-001	2.24e-002
n-Hexane	2.50e-001	9.19e-003
Cyclohexane	9.80e-002	3.51e-003
Other Hexanes	3.19e-001	1.17e-002
Heptanes	3.31e-001	1.41e-002
Benzene	1.37e-001	4.56e-003
Toluene	4.03e-001	1.58e-002
C8+ Heavies	5.73e-001	4.16e-002
Total Components	100.00	1.06e+000

ATTACHMENT U – FACILITY-WIDE CONTROLLED EMISSIONS SUMMARY SHEET

List all sources of emissions in this table. Use extra pages if necessary.

Emission Point ID#	NO_x		CO		VOC		SO_2		PM_{10}		$PM_{2.5}$		CH_4		GHG (CO_2e)	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
1E	0.15	0.66	0.13	0.55	0.01	0.04	<0.01	<0.01	0.01	0.05	0.01	0.05	<0.01	0.02	181.1	793
2E	0.15	0.66	0.13	0.55	0.01	0.04	<0.01	<0.01	0.01	0.05	0.01	0.05	<0.01	0.02	181.1	793
3E	0.15	0.66	0.13	0.55	0.01	0.04	<0.01	<0.01	0.01	0.05	0.01	0.05	<0.01	0.02	181.1	793
4E	0.05	0.22	0.04	0.18	<0.01	0.01	<0.01	<0.01	<0.01	0.02	<0.01	0.02	<0.01	0.01	60.4	264
5E					2.96	0.91										
6E					0.08	0.04										
7E	0.19	0.81	0.37	1.62	0.04	0.18	<0.01	<0.01	0.01	0.06	0.01	0.06	0.13	0.55	89.7	393
8E	<0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.6	7
9E	0.29	1.25	1.10	4.81	1.84	0.43	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.26	0.07	446.7	1956
10E																
11E	0.18	0.78	0.52	2.28	0.38	1.66	<0.01	<0.01	0.02	0.10	0.02	0.10	<0.01	0.02	257.6	1128.3
12E					1.83	8.03							0.26	1.14	6.5	28
13E	1.52	6.66	0.52	2.27	1.40	6.13	<0.01	0.03	0.11	0.50	0.11	0.50	12.32	53.97	1,750	7,666
14E	0.02	0.09	0.02	0.07	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.01	24.2	105.8
TOTAL	2.69	11.79	2.95	12.90	6.73	17.50	0.01	0.05	0.20	0.90	0.20	0.90	12.73	55.80	3,189	13,929

Annual emissions shall be based on 8,760 hours per year of operation for all emission units except emergency generators.
According to 45CSR14 Section 2.43.e, fugitive emissions are not included in the major source determination because it is not listed as one of the source categories in Table 1. Therefore, fugitive emissions shall not be included in the PTE above.

ATTACHMENT U – FACILITY-WIDE HAP CONTROLLED EMISSIONS SUMMARY SHEET

List all sources of emissions in this table. Use extra pages if necessary.

Emission Point ID#	Formaldehyde		Benzene		Toluene		Ethylbenzene		Xylenes		Hexane		Total HAPs	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
1E											<0.01	0.01	<0.01	0.01
2E											<0.01	0.01	<0.01	0.01
3E											<0.01	0.01	<0.01	0.01
4E											<0.01	<0.01	<0.01	<0.01
5E											0.16	0.05	0.16	0.05
6E											0.01	<0.01	0.01	<0.01
7E	0.015	0.065	<0.01	<0.01									0.02	0.10
8E														
9E	<0.01	<0.01									<0.01	0.01	<0.01	0.02
10E														
11E	<0.01	<0.01	<0.01	0.02	0.016	0.07					0.01	0.05	0.03	0.14
12E			<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	0.01	0.06	0.24	0.06	0.26
13E	0.32	1.41	<0.01	0.02	<0.01	0.02	<0.01	<0.01	<0.01	0.01	0.01	0.06	0.53	2.31
14E	<0.01	<0.01									<0.01	<0.01	<0.01	<0.01
TOTAL	0.34	1.48	0.01	0.05	0.02	0.10	<0.01	<0.01	<0.01	0.02	0.26	0.45	0.82	2.93

Annual emissions shall be based on 8,760 hours per year of operation for all emission units except emergency generators.
According to 45CSR14 Section 2.43.e, fugitive emissions are not included in the major source determination because it is not listed as one of the source categories in Table 1. Therefore, fugitive emissions shall not be included in the PTE above.

ATTACHMENT V – CLASS I LEGAL ADVERTISEMENT

Publication of a proper Class I legal advertisement is a requirement of the G70-D registration process. In the event the applicant's legal advertisement fails to follow the requirements of 45CSR13, Section 8 or the requirements of Chapter 59, Article 3, of the West Virginia Code, the application will be considered incomplete and no further review of the application will occur until this is corrected.

The applicant, utilizing the format for the Class I legal advertisement example provided on the following page, shall have the legal advertisement appear a minimum of one (1) day in the newspaper most commonly read in the area where the facility exists or will be constructed. The notice must be published no earlier than five (5) working days of receipt by this office of your application. The original affidavit of publication must be received by this office no later than the last day of the public comment period.

The advertisement shall contain, at a minimum, the name of the applicant, the type and location of the source, the type and amount of air pollutants that will be discharged (excluding fugitive emissions), the nature of the permit being sought, the proposed start-up date for the source, and a contact telephone number for more information.

The location of the source should be as specific as possible starting with: 1.) the street address of the source; 2.) the nearest street or road; 3.) the nearest town or unincorporated area, 4.) the county, and 5.) latitude and longitude coordinates in decimal format.

Types and amounts of pollutants discharged **must include** all regulated pollutants (Nitrogen Oxides, Carbon Monoxide, Particulate Matter-2.5, Particulate Matter-10, Volatile Organic Compounds, Sulfur Dioxide, Carbon Dioxide Equivalents, Methane, Formaldehyde, Benzene, Toluene, Ethylbenzene, Xylenes, Hexane, Total Hazardous Air Pollutants and their potential to emit or the permit level being sought in units of tons per year.

In the event the 30th day is a Saturday, Sunday, or legal holiday, the comment period will be extended until 5:00 p.m. on the following regularly scheduled business day.

A list of qualified newspapers that are eligible to publish legal ads may be found:

http://www.sos.wv.gov/elections/resource/Documents/Qualified%20Newspapers.pdf

Affidavit Notice Will Be Submitted Upon Receipt

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that Jay-Bee Oil & Gas, Inc. has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a modification of the G70-C General Permit Registration and conversion to a G70-D General Permit Registration for its Moe Well Pad Production Facility located off Klondike Acres Rd near Middlebourne in Tyler County, West Virginia. The latitude and longitude coordinates are: 39.46791, -80.88719.

The applicant estimates an increase in potential emissions of the following regulated air pollutants:

6.12 tons of Nitrogen Oxides per year
4.27 tons of Volatile Organics per year
0.42 tons of Particulate Matter per year
0.03 tons of Sulfur Dioxide per year
1.41 tons of Formaldehyde per year
0.01 tons of n-Hexane per year
0.01 tons of Xylene per year
2.16 tons of Total Hazardous Air Pollutants per year
54.04 tons of Methane per year
6,809 tons of Greenhouse Gases per year

The applicant estimates a decrease in potential emissions of the following regulated air pollutants:

0.06 tons of Carbon Monoxide per year
0.06 tons of Toluene per year

Startup of operation is planned to begin on or about the 1st day of February, 2017. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1227, during normal business hours.

Dated this the **(Day)** day of **(Month)**, **(Year)**.

By: Mr. Shane Dowell
Office Manager
Jay-Bee Oil & Gas, Inc.