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R. Alex Bosiljevac
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Coordinator

December 5, 2016

Mr. William F. Durham, Director
West Virginia Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, West Virginia, 25304

RE: G70-D General Permit Registration Application
EQT Production Company
OXF-160 Natural Gas Production Site
Permit No. R13-3011, Plant ID No. 017-00039

Dear Director Durham:

Enclosed are one (1) original hard copy and two (2) complete PDFs included on CD-ROM of a G70-D General Permit Registration Application for the OXF-160 natural gas production site. A legal advertisement will be published in Doddridge Independent the next few days and proof of publication will be forwarded as soon as it is received. Please contact me for payment of the application fee by credit card.

If you have any questions concerning this permit application, please contact me at (412) 395-3699 or by email at abosiljevac@eqt.com.

Sincerely,

RAB

R. Alex Bosiljevac
EQT Corporation

Enclosures

PROJECT REPORT

EQT Production
OXF-160 Pad

G70-D Permit Application

Where energy meets innovation.

TRINITY CONSULTANTS
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November 2016

Trinity Consultants

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EQT Production Company (EQT) is submitting this Class II General Permit (G70-D) application to the West Virginia Department of Environmental Protection (WVDEP) for the construction and operation of new equipment at an natural gas production well pad, OXF-160, located in Doddridge County, West Virginia. The OXF-160 pad is currently operating under R13 permit number R13-3011.

1.1. FACILITY AND PROJECT DESCRIPTION

The OXF-160 pad is a natural gas production facility that currently consists of three (3) natural gas wells. Natural gas and liquids (including water and condensate) are extracted from deposits underneath the surface. Natural gas is transported from the well to a gas line for additional processing and compression, as necessary. The liquids produced are stored in storage vessels.

The OXF-160 pad currently consists of the following equipment:

- Four (4) 210 barrel (bbl) storage tanks for condensate/water (produced fluids) controlled by one (1) existing combustor rated at 11.66 MMBtu/hr;
- Four (4) line heaters, each rated at 1.54 MMBtu/hr (heat input);
- Two (2) thermoelectric generators (TEGs), each rated at 0.013 MMBtu/hr (heat input);
- Produced fluid truck loading; and
- Associated piping and components.

This application seeks to permit the following equipment at the OXF-160 pad:

- Four (4) new natural gas wells;
- Six (6) new 400 barrel (bbl) storage tanks for condensate/water (produced fluids) to replace the existing tanks;
- Five (5) line heaters for rated at 1.54 MMBtu/hr each(heat input) ;
- One (1) low pressure separator and associated 1.00 MMBtu/hr line heater;
- One (1) additional combustor rated at 19.22 MMBtu/hr;
- One (1) vapor recovery unit (VRU) powered by a natural gas fired 275 horsepower (hp) engine; and
- One (1) 140 bbl storage tank for sand and produced fluids from the sand separator (vapors from this tank may be controlled by combustors but are not represented as controlled in this application).

A process flow diagram is included as Attachment D. A comparison of the potential emissions of the proposed and existing equipment at the wellpad in comparison with G70-D emission limits is provided in Table 1. Facility emissions are well below the permit limits. Note that in accordance with condition 1.1.1. of the G70-D permit, fugitive emissions are not considered in determining eligibility of the permit.

Table 1 - Comparison of Wellpad Potential Emissions to G70-D Permit Emission Limits

Pollutant	Wellpad Potential Annual Emissions (tpy)	G70-D Maximum Annual Emission Limits (tpy)
Nitrogen Oxides	24.09	50
Carbon Monoxide	23.32	80
Volatile Organic Compounds	15.37	80
Particulate Matter – 10/2.5	6.53	20
Sulfur Dioxide	0.13	20
Individual HAP (n-hexane)[1]	0.73	8
Total HAP[1]	1.39	20

1. Includes fugitive emissions

1.2. SOURCE STATUS

WVDEP must make stationary source determinations on a case-by-case basis using the guidance under the Clean Air Act (CAA) and EPA's and WVDEP's implementing regulations. The definition of stationary source in 40 CFR 51.166(b) includes the following:

> *"(6) Building, structure, facility, or installation means all of the pollutant emitting activities which belong to the same industrial grouping, are located on or more contiguous or adjacent properties, and are under control of the same person (or persons under common control)."*

Other additional pollutant emitting facilities should be aggregated with the OXF-160 Pad for air permitting purposes if, and only if, all three elements of the "stationary source" definition above are fulfilled.

WVDEP determined that the OXF-160 pad is a separate stationary source when the current permit was issued. There are no Marcellus facilities within a quarter-mile radius of the OXF-160 Pad. The nearest wellpad, OXF-131, is located approximately 0.30 miles northeast of OXF-160. Therefore, the OXF-160 pad should continue to be considered a separate stationary source with respect to permitting programs, including Title V and Prevention of Significant Deterioration (PSD). As discussed in this application, the facility is a minor source of air emissions with respect to New Source Review (NSR) and Title V permitting.

1.3. G70-D APPLICATION ORGANIZATION

This West Virginia Code of State Regulations, Title 45 (CSR) Series 13 (45 CSR 13) G70-D permit application is organized as follows:

- Section 2: Sample Emission Source Calculations;
- Section 3: Regulatory Discussion;
- Section 4: G70-D Application Form;
- Attachment A: Single Source Determination;
- Attachment B: Siting Criteria Waiver **(Not Applicable)**;
- Attachment C: Business Certificate;
- Attachment D: Process Flow Diagram;
- Attachment E: Process Description;
- Attachment F: Plot Plan;
- Attachment G: Area Map;
- Attachment H: G70-D Section Applicability Form;
- Attachment I: Emission Units Table;
- Attachment J: Fugitive Emissions Summary Sheet;
- Attachment K: Gas Well Data Sheet;
- Attachment L: Storage Vessel Data Sheet;
- Attachment M: Heaters Data Sheet;
- Attachment N: Engines Data Sheet;
- Attachment O: Truck Loading Data Sheet;
- Attachment P: Glycol Dehydrator Data Sheet **(Not Applicable)**;
- Attachment Q: Pneumatic Controller Data Sheet
- Attachment R: Pneumatic Pump Data Sheet
- Attachment S: Air Pollution Control Device Data Sheet;
- Attachment T: Emission Calculations;
- Attachment U: Emission Summary Sheet;
- Attachment V: Class I Legal Advertisement; and
- Attachment W: General Permit Registration Application Fee.

The characteristics of air emissions from the natural gas production operations, along with the methodology for calculating emissions, are briefly described in this section of the application. Detailed emission calculations are presented in Attachment S of this application.

Emissions from this project will result from natural gas combustion in the line heaters, combustors, as well as storage of organic liquids in storage tanks and loading of organic liquids into tank trucks. In addition, fugitive emissions will result from component leaks from the operation of the station. The methods by which emissions from each of these source types, as well as the existing source types, are calculated are summarized below.

- **Line Heaters and Enclosed Combustors:** Potential emissions of criteria pollutants and hazardous air pollutants (HAPs) are calculated using U.S. EPA's AP-42 factors for natural gas external combustion.[1] These calculations assume a site-specific heat content of natural gas. Greenhouse gas emissions are calculated according to 40 CFR 98 Subpart C.[2]

- **VRU Engines:** Potential emissions of oxides of nitrogen (NO_X), carbon monoxide (CO), and volatile organic compounds (VOC) are calculated using 40 CFR 60 Subpart JJJJ emissions factor standards. Remaining criteria pollutants and HAPs are calculated using U.S. EPA's AP-42 factors for natural gas fired engines.[3] These calculations assume a specific heat content of natural gas from the closest wellpad. Greenhouse gas emissions are calculated according to 40 CFR 98 Subpart C.

- **Fugitive Equipment Leaks:** Emissions of VOC and HAPs from leaking equipment components have been estimated using facility estimated component counts and types along with emission factors from the *Protocol for Equipment Leak Emission Estimates, EPA 453/R-95-017, November 1995.* Emission factors used are based on average measured TOC from component types indicated. Greenhouse gas emissions from component leaks are calculated according to the procedures in 40 CFR 98 Subpart W.[4] Pneumatic devices at the wellpad are intermittent bleed and are assumed to be in operation 1/3 of the year. Fuel cell emissions are calculated based on mass balance.

- **Storage Tanks:** Working, breathing and flashing emissions of VOC and HAPs from the storage tanks at the facility are calculated using Bryan Research & Engineering ProMax® Software. Controlled calculations assume an overall control efficiency (capture and destruction) of 95%. The throughput for the produced fluids tanks are based on the maximum annualized monthly condensate and produced water at the OXF-160 well pad (i.e., the maximum monthly throughput for the pad times 12) scaled up to seven wells. The composition for the analysis was from a sample taken at OXF-160. Emissions of VOC and HAPs from the sand separator tank are calculated using E&P TANK v2.0. The produced fluids throughput is calculated as follows:

$$Throughput\left(\frac{bbl}{day}\right) = \left(Condensate\ Throughput\left(\frac{bbl}{month}\right) + \left(Produced\ Water\ Throughput\left(\frac{bbl}{month}\right)\right)\right) * \frac{12\left(\frac{months}{year}\right)}{365\left(\frac{days}{year}\right)}\ \text{X}\ (7/3)$$

- **Tank Truck Loading:** Uncontrolled emissions of VOC and HAPs from the loading of organic liquids from storage tanks to tank truck are calculated using Bryan Research Engineering ProMax® Software. Truck

[1] U.S. EPA, AP 42, Fifth Edition, Volume I, Chapter 1.4, Natural Gas Combustion, Supplement D, July 1998.
[2] 40 CFR 98 Subpart C, *General Stationary Fuel combustion Sources*, Tables C-1 and C-2.
[3] U.S. EPA, AP 42, Fifth Edition, Volume I, Chapter 3.2, Natural Gas-fired Reciprocating Engines, Supplement D, August 2000.
[4] 40 CFR 98 Subpart W, *Petroleum and Natural Gas Systems*, Section 98.233(r), *Population Count and Emission Factors.*

loading is controlled by the enclosed combustors. U.S. EPA's AP-42 Chapter 5 Section 2 factors were used for capture efficiency.[5]

- **Haul Roads:** Fugitive dust emitted from facility roadways has been estimated using projected vehicle miles traveled along with U.S. EPA's AP-42 factors for unpaved haul roads.[6]

[5] U.S. EPA, AP 42, Fifth Edition, Volume I, Chapter 5.2, Transportation And Marketing Of Petroleum Liquids, June 2008.
[6] U.S. EPA, AP 42, Fifth Edition, Volume I, Section 13.2.2, Unpaved Roads, November 2006.

This section documents the applicability determinations made for Federal and State air quality regulations. In this section, applicability or non-applicability of the following regulatory programs is addressed:

- Prevention of Significant Deterioration permitting;
- Title V of the 1990 Clean Air Act Amendments;
- New Source Performance Standards (NSPS);
- National Emission Standards for Hazardous Air Pollutants (NESHAP); and
- West Virginia State Implementation Plan (SIP) regulations.

This review is presented to supplement and/or add clarification to the information provided in the WVDEP G70-D permit application forms.

In addition to providing a summary of applicable requirements, this section of the application also provides non-applicability determinations for certain regulations, allowing the WVDEP to confirm that identified regulations are not applicable to the wellpad. Note that explanations of non-applicability are limited to those regulations for which there may be some question of applicability specific to the operations at the wellpad. Regulations that are categorically non-applicable are not discussed (e.g., NSPS Subpart J, Standards of Performance for Petroleum Refineries).

3.1. PREVENTION OF SIGNIFICANT DETERIORATION SOURCE CLASSIFICATION

Federal construction permitting programs regulate new and modified sources of attainment pollutants under Prevention of Significant Deterioration. PSD regulations apply when a major source makes a change, such as installing new equipment or modifying existing equipment, and a significant increase in emissions results from the change. The wellpad is not a major source with respect to the PSD program since its potential emissions are below all the PSD thresholds. As such, PSD permitting is not triggered by this construction activity. EQT will monitor future construction activities at the site closely and will compare any future increase in emissions with the PSD thresholds to ensure these activities will not trigger this program.

3.2. TITLE V OPERATING PERMIT PROGRAM

Title 40 of the Code of Federal Regulations Part 70 (40 CFR 70) establishes the federal Title V operating permit program. West Virginia has incorporated the provisions of this federal program in its Title V operating permit program in West Virginia CSR 45-30. The major source thresholds with respect to the West Virginia Title V operating permit program regulations are 10 tons per year (tpy) of a single HAP, 25 tpy of any combination of HAP and 100 tpy of all other regulated pollutants. The potential emissions of all regulated pollutants are below the corresponding threshold(s) at this facility after the proposed project. Therefore, the wellpad is not a major source for Title V purposes.

3.3. NEW SOURCE PERFORMANCE STANDARDS

New Source Performance Standards, located in 40 CFR 60, require new, modified, or reconstructed sources to control emissions to the level achievable by the best demonstrated technology as specified in the applicable provisions. Moreover, any source subject to an NSPS is also subject to the general provisions of NSPS Subpart A, except where expressly noted. The following is a summary of applicability and non-applicability determinations for NSPS regulations of relevance to the wellpad. The following NSPS could potentially apply to the wellpad:

- 40 CFR Part 60 Subparts D/Da/Db/Dc – Steam Generating Units
- 40 CFR Part 60 Subpart K/Ka/Kb – Storage Vessels for Petroleum Liquids/Volatile Organic Liquids
- 40 CFR Part 60 Subpart JJJJ – Stationary Spark Ignition Internal Combustion Engines

- 40 CFR Part 60 Subpart OOOO – Crude Oil and Natural Gas Production, Transmission, and Distribution
- 40 CFR Part 60 Subpart OOOOa – Crude Oil and Natural Gas Facilities

3.3.1. NSPS Subparts D, Da, Db, and Dc – Steam Generating Units

These subparts apply to steam generating units of various sizes, all greater than 10 MMBtu/hr. The proposed project does not include any steam generating units with a heat input greater than 10 MMbtu/hr, therefore the requirements of these subparts do not apply.

3.3.2. NSPS Subparts K, Ka, and Kb – Storage Vessels for Petroleum Liquids/Volatile Organic Liquids

These subparts apply to storage tanks of certain sizes constructed, reconstructed, or modified during various time periods. Subpart K applies to storage tanks constructed, reconstructed, or modified prior to 1978, and Subpart Ka applies to those constructed, reconstructed, or modified prior to 1984. Both Subparts K and Ka apply to storage tanks with a capacity greater than 40,000 gallons. Subpart Kb applies to volatile organic liquid (VOL) storage tanks constructed, reconstructed, or modified after July 23, 1984 with a capacity equal to or greater than 75 m^3 (~19,813 gallons). All of the tanks at the wellpad have a capacity of 19,813 gallons or less. As such, Subparts K, Ka, and Kb do not apply to the storage tanks at the wellpad.

3.3.3. NSPS Subparts JJJJ – Stationary Spark Ignition Internal Combustion Engines

New Source Performance Standards 40 CFR Part 60 Subpart JJJJ (NSPS JJJJ) affects owners and operators of stationary spark ignition internal combustion engines (SI ICE) that commence construction, reconstruction or modification after June 12, 2006. Applicability dates are based on the date the engine was ordered by the operator. The proposed VRU engine at the well pad is a 4-stroke rich burn, spark ignition engine manufactured after January 1, 2011, and is subject to this subpart. EQT will operate the engine according to the manufacturer's recommended practices and demonstrate compliance with the requirements specified in 40 CFR §60.4244 (testing methods) and 40 CFR§60.4243 (maintenance plan/records and performance testing frequency) for noncertified affected SI ICE at the facility, which includes an initial performance test within 1 year of engine startup to demonstrate compliance with the regulation.

3.3.4. NSPS Subpart OOOO - Crude Oil and Natural Gas Production, Transmission, and Distribution

Subpart OOOO, Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution, applies to affected facilities that commenced construction, reconstruction, or modification after August 23, 2011 and or before September 18, 2015. This NSPS was published in the Federal Register on August 16, 2012, and subsequently amended. The proposed project does not change applicability dates with respect to NSPS Subpart OOOO for existing equipment. Therefore, this subpart is not applicable to the proposed project. Note that EPA recently finalized 40 CFR 60 Subpart OOOOa; applicability of Subpart OOOOa is discussed in the following section.

3.3.5. NSPS Subpart OOOOa—Crude Oil and Natural Gas Facilities

Subpart OOOOa, Standards of Standards of Performance for Crude Oil and Natural Gas Facilities, applies to affected facilities that commenced construction, reconstruction, or modification after September 18, 2015. The regulation was published final in the Federal Register on June 3, 2016. The rule includes provisions for the following facilities:

- Hydraulically fractured wells;
- Centrifugal compressors located between the wellhead and the point of custody transfer to the natural gas distribution segment;
- Reciprocating compressors located between the wellhead and the point of custody transfer to the natural gas distribution segment;

- Continuous bleed natural gas-driven pneumatic controllers with a bleed rate of > 6 scfh located in the production, gathering, processing, or transmission and storage segments (excluding natural gas processing plants);
- Continuous bleed natural gas-driven pneumatic controllers located at natural gas processing plants;
- Pneumatic pumps located in the production and processing segments;
- Storage vessels located in the production, gathering, processing, or transmission and storage segments;
- The collection of fugitive emissions components at a well site;
- The collection of fugitive emissions components at a compressor station; and
- Sweetening units located onshore that process natural gas produced from either onshore or offshore wells.

Based on the rule, the following paragraphs describe the applicability of the facilities to be located at the proposed facility.

40 CFR 60.5385 requires owners and operators of affected reciprocating compressors to change the rod packing prior to operating 26,000 hours or prior to 36 months since start up or the last packing replacement. However, according to §60.5365a, compressors located at well sites are not affected facilities under Subpart OOOOa.

There are six (6) produced fluid storage vessels and one (1) sand separator storage vessel at the wellpad. The storage vessels at the facility will each have potential VOC emissions less than 6 tpy based on the permit application materials and enforceable limits to be included in the G70-D permit. As such, per 60.5365a(e), the tanks will not be storage vessel affected facilities under the rule.

The proposed well pad is an affected facility under 60.5365a(i). Therefore, EQT will be required to monitor all fugitive emission components (ex. connectors, flanges, etc.) with an optical gas imaging (OGI) device, and repair all sources of fugitive emissions in accordance with the rule. EQT must also develop a corporate-wide monitoring plan and a site specific monitoring plan (or one plan that incorporates all required elements), and conduct surveys on a semi-annual basis. EQT is also subject to the applicable recordkeeping and reporting requirements of the rule.

The new pneumatic controllers will potentially be subject to NSPS OOOOa. Per 60.5365a(d)(1), a pneumatic controller affected facility is a single continuous bleed natural gas driven pneumatic controller operating at a natural gas bleed rate greater than 6 scfh. No pneumatic controllers installed will meet the definition of a pneumatic controller affected facility. Therefore, these units are not subject to the requirements of Subpart OOOOa.

Per 60.5365a(h)(1), a pneumatic pump for well sites is defined as a single natural gas-driven diaphragm pump. The proposed wellpad will not include any pneumatic pump that meet this definition. As such, there will not be additional requirements regarding this type of equipment under Subpart OOOOa.

3.3.6. Non-Applicability of All Other NSPS

NSPS are developed for particular industrial source categories. Other than NSPS developed for natural gas processing plants (Subparts OOOO) and associated equipment (Subparts D-Dc and K-Kb), the applicability of a particular NSPS to the wellpad can be readily ascertained based on the industrial source category covered. All other NSPS are categorically not applicable to the proposed project.

3.4. NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

Part 63 NESHAP allowable emission limits are established on the basis of a maximum achievable control technology (MACT) determination for a particular major source. A HAP major source is defined as having potential emissions in excess of 25 tpy for total HAP and/or potential emissions in excess of 10 tpy for any individual HAP. The wellpad is an Area (minor) source of HAP since its potential emissions of HAP are less than the 10/25 major source thresholds. NESHAP apply to sources in specifically regulated industrial source categories (Clean Air Act Section 112(d)) or on a case-by-case basis (Section 112(g)) for facilities not regulated as a specific industrial source type. Besides 40 CFR 63

Subpart A (NESHAP Subpart A), which is similar to 40 CFR 60 Subpart A (NSPS Subpart A), the following NESHAP could potentially apply to the wellpad:

- 40 CFR Part 63 Subpart HH – Oil and Natural Gas Production Facilities
- 40 CFR Part 63 Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines
- 40 CFR Part 63 Subpart JJJJJJ – Industrial, Commercial, and Institutional Boilers

The applicability of these NESHAP Subparts is discussed in the following sections.

3.4.1. 40 CFR 63 Subpart HH – Oil and Natural Gas Production Facilities

This standard contains requirements for both major and area sources of HAP. At area sources, the only affected source is a triethylene glycol dehydration unit (§63.760(b)(2)). The wellpad does not include a triethylene glycol dehydration unit; therefore the requirements of this subpart do not apply.

3.4.2. 40 CFR 63 Subpart ZZZZ – Stationary Reciprocating Internal Engines

This rule affects reciprocating internal combustion engines (RICE) located at a major and area sources of HAP. 40 CFR §63.6590(c) states that a new or reconstructed stationary RICE located at an area HAP source must meet the requirements of NESHAP Subpart ZZZZ by meeting the requirements of NSPS Subpart JJJJ. No further requirements apply for such engines under NESHAP Subpart ZZZZ. The OXF-160 well pad is a minor (area) source of hazardous air pollutants and the VRU engine is considered a new stationary RICE. Therefore, the requirements contained in §63.6590(c) are applicable. EQT will be in compliance with applicable requirements of 40 CFR 63 Subpart ZZZZ by meeting the applicable requirements of 40 CFR 60 Subpart JJJJ.

3.4.3. 40 CFR 63 Subpart JJJJJJ – Industrial, Commercial, and Institutional Boilers

This MACT standard applies to industrial, commercial, and institutional boilers of various sizes and fuel types at area sources. The line heaters are natural gas-fired and are specifically exempt from this subpart. Therefore, no sources at the wellpad are subject to any requirements under 40 CFR 63 Subpart JJJJJJ.

3.5. WEST VIRGINIA SIP REGULATIONS

The wellpad is potentially subject to regulations contained in the West Virginia Code of State Regulations, Chapter 45 (Code of State Regulations). The Code of State Regulations fall under two main categories, those regulations that are generally applicable (e.g., permitting requirements), and those that have specific applicability (e.g., PM standards for manufacturing equipment).

3.5.1. 45 CSR 2: To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers

45 CSR 2 applies to fuel burning units, defined as equipment burning fuel "for the primary purpose of producing heat or power by indirect heat transfer". The line heaters are fuel burning units and therefore must comply with this regulation. Per 45 CSR 2-3, opacity of emissions from units shall not exceed 10 percent.

3.5.2. 45 CSR 4: To Prevent and Control the Discharge of Air Pollutants into the Air Which Causes or Contributes to an Objectionable Odor

According to 45 CSR 4-3:

No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.

The wellpad is generally subject to this requirement. However, due to the nature of the process at the wellpad, production of objectionable odor from the wellpad during normal operation is unlikely.

3.5.3. 45 CSR 6: Control of Air Pollution from the Combustion of Refuse

45 CSR 6 applies to activities involving incineration of refuse, defined as "the destruction of combustible refuse by burning in a furnace designed for that purpose. For the purposes of this rule, the destruction of any combustible liquid or gaseous material by burning in a flare or flare stack, thermal oxidizer or thermal catalytic oxidizer stack shall be considered incineration." The enclosed combustors are incinerators and therefore must comply with this regulation. Per 45 CSR 6-4.3, opacity of emissions from this unit shall not exceed 20 percent, except as provided by 4.4. PM emissions from this unit will not exceed the levels calculated in accordance with 6-4.1.

3.5.4. 45 CSR 16: Standards of Performance for New Stationary Sources

45 CSR 16-1 incorporates the federal Clean Air Act (CAA) standards of performance for new stationary sources set forth in 40 CPR Part 60 by reference. As such, by complying with all applicable requirements of 40 CFR Part 60 at the wellpad, EQT will be complying with 45 CSR 16.

3.5.5. 45 CSR 17: To Prevent and Control Particulate Matter Air Pollution from Materials Handling, Preparation, Storage and Other Sources of Fugitive Particulate Matter

According to 45 CSR 17-3.1:

No person shall cause, suffer, allow or permit fugitive particulate matter to be discharged beyond the boundary lines of the property lines of the property on which the discharge originates or at any public or residential location, which causes or contributes to statutory air pollution.

Due to the nature of the activities at the wellpad, it is unlikely that fugitive particulate matter emissions will be emitted under normal operating conditions. However, EQT will take measures to ensure any fugitive particulate matter emissions will not cross the property boundary should any such emissions occur.

3.5.6. 45 CSR 21-28: Petroleum Liquid Storage in Fixed Roof Tanks

45 CSR 21-28 applies to any fixed roof petroleum liquid storage tank with a capacity greater than 40,000 gallons. The capacity of each storage tank proposed for the wellpad is less than 40,000 gallons; therefore, 45 CSR 21-28 will not apply to the petroleum liquid storage tanks at this wellpad.

3.5.7. 45 CSR 34: Emissions Standards for Hazardous Air Pollutants

45 CSR 34-1 incorporates the federal Clean Air Act (CAA) national emissions standards for hazardous air pollutants (NESHAPs) as set forth in 40 CPR Parts 61 and 63 by reference. As such, by complying with all applicable requirements of 40 CFR Parts 61 and 63 at the wellpad, EQT will be complying with 45 CSR 34. Note that there are no applicable requirements under 40 CFR Parts 61 and 63 for the wellpad.

3.5.8. Non-Applicability of Other SIP Rules

A thorough examination of the West Virginia SIP rules with respect to applicability at the wellpad reveals many SIP regulations that do not apply or impose additional requirements on operations. Such SIP rules include those specific to a particular type of industrial operation that is categorically not applicable to the wellpad.

4. G70-D APPLICATION FORMS

The WVDEP permit application forms contained in this application include all applicable G70-D application forms including the required attachments.

west virginia department of environmental protection

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Phone (304) 926-0475
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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 (UPDATE)
☐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): EQT Production Company

Federal Employer ID No. (FEIN): 25-0724685

Applicant's Mailing Address: 625 Liberty Avenue, Suite 1700

City: Pittsburgh	State: PA	ZIP Code: 15222

Facility Name: OXF-160 Pad

Operating Site Physical Address: Upper Run Road, Oxford, WV
If none available, list road, city or town and zip of facility.

City: Oxford	Zip Code: 26421	County: Doddridge

Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits):
Latitude: 39.18169
Longitude: -80.79904

SIC Code: 1311 NAICS Code: 211111	DAQ Facility ID No. (For existing facilities) 017-00039

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 Mike Gavin 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: Mike Gavin, Vice President — Phone: — Fax:
Email: gavinm@eqt.com — Date: 12/5/16

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

If applicable:
Environmental Contact
Name and Title: Alex Bosiljevac, Environmental Coordinator — Phone: 412-395-3699 — Fax: 412-395-7027
Email: ABosiljevac@eqt.com — Date:

OPERATING SITE INFORMATION
Briefly describe the proposed new operation and/or any change(s) to the facility: General permit application for an existing natural gas production well pad.
Directions to the facility: From West Union, take US-50 west for 3 miles. Turn left onto Old U.S. 80 E for 1.9 miles, then turn left to continue onto County Route 21/Oxford Rd for 4.5 miles. Turn left onto South Fork of Hughes River for 3.5 miles, then turn right onto Upper Run. Access road will be on the right after about 0.8 miles.

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): R. Alex Bosiljevac, abosiljevac@eqt.com ☒$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.

ATTACHMENT A

Single Source Determination

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 ☒

ATTACHMENT A: SINGLE SOURCE DETERMINATION MAP

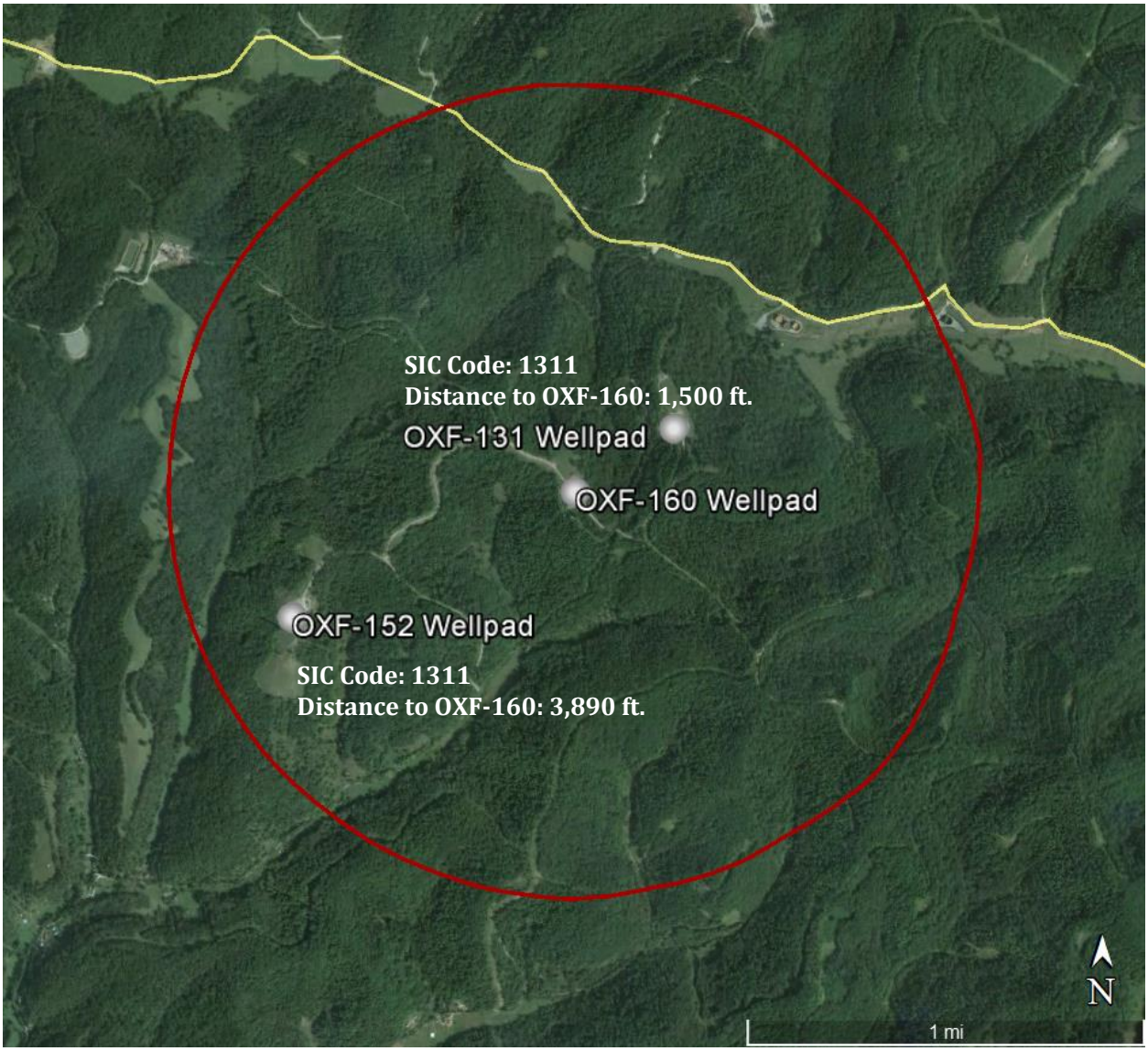


Figure 1 - Map of OXF-160 Location with 1 Mile Radius Circle

Coordinates:
Latitude: 39°10'53.31"N
Longitude: 80°47'57.12"W

ATTACHMENT B

Siting Criteria Waiver *(Not Applicable)*

ATTACHMENT B - SITING CRITERIA WAIVER
If applicable, please complete this form and it must be notarized.

G70-D General Permit
Siting Criteria Waiver

WV Division of Air Quality 300' Waiver

I _____ hereby
Print Name

acknowledge and agree that _____ will
General Permit Applicant's Name

construct an emission unit(s) at a natural gas production facility
that will be located within 300' of my dwelling and/or business.

.

I hereby offer this waiver of siting criteria to the West Virginia Department of Environmental Protection Division of Air Quality as permission to construct, install and operate in such location.

Signed:

_____
Signature Date

_____
Signature Date

Taken, subscribed and sworn before me this _____ day of

_____, 20_____.

My commission expires: _____

SEAL_____
Notary Public

ATTACHMENT C

Business Certificate

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.

WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION CERTIFICATE

ISSUED TO:
EQT PRODUCTION COMPANY
625 LIBERTY AVE 1700
PITTSBURGH, PA 15222-3114

BUSINESS REGISTRATION ACCOUNT NUMBER: **1022-8081**

This certificate is issued on: 08/4/2010

This certificate is issued by
the West Virginia State Tax Commissioner
in accordance with Chapter 11, Article 12, of the West Virginia Code

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.

atL006 v.3
L0553297664

ATTACHMENT D

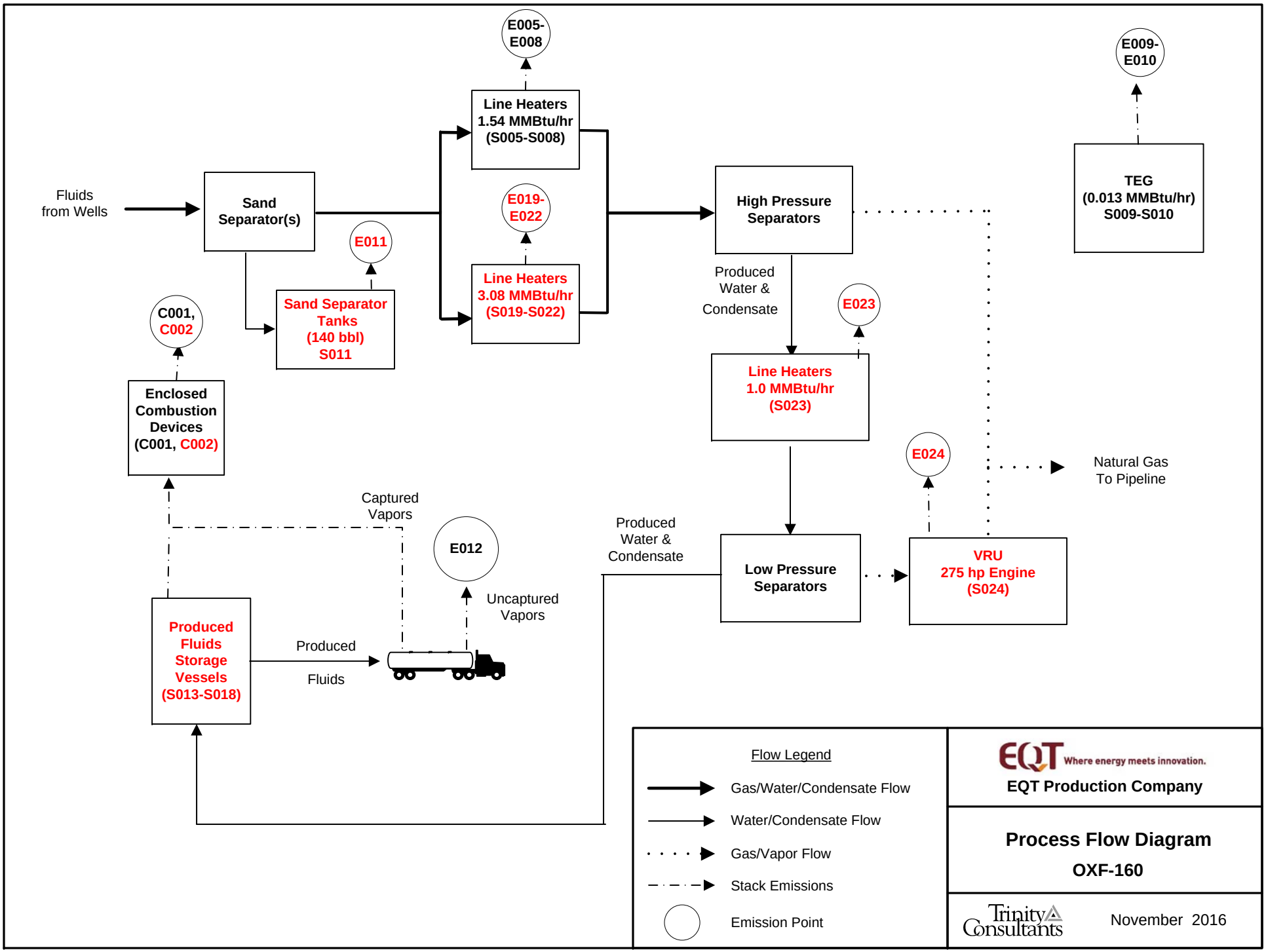
Process Flow Diagram

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.


E005-E008
Line Heaters 1.54 MMBtu/hr (S005-S008)
E009-E010
TEG (0.013 MMBtu/hr) S009-S010
Fluids from Wells
Sand Separator(s)
E011
E019-E022
High Pressure Separators
Sand Separator Tanks (140 bbl) S011
Line Heaters 3.08 MMBtu/hr (S019-S022)
Produced Water & Condensate
E023
C001, C002
Line Heaters 1.0 MMBtu/hr (S023)
Enclosed Combustion Devices (C001, C002)
E024
Natural Gas To Pipeline
Captured Vapors
E012
Produced Water & Condensate
Low Pressure Separators
VRU 275 hp Engine (S024)
Uncaptured Vapors
Produced Fluids Storage Vessels (S013-S018)
Produced Fluids
Flow Legend
Gas/Water/Condensate Flow
Water/Condensate Flow
Gas/Vapor Flow
Stack Emissions
Emission Point
EQT Where energy meets innovation.
EQT Production Company
Process Flow Diagram
OXF-160
Trinity Consultants
November 2016

ATTACHMENT E

Process Description

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.

ATTACHMENT E: PROCESS DESCRIPTION

This G70-C Permit Application involves the installation of new equipment at an existing natural gas production wellpad (OXF-160). The proposed project will consist of four (4) new wells with the following equipment: six (6) 400 bbl produced fluid tanks, four (4) line heaters (each rated 3.08 MMbtu/hr), one enclosed combustor (rated 19.22 MMbtu/hr), one (1) low pressure separator with associated heater (rated 1.0 MMbtu/hr) and vapor recovery unit (VRU), and one (1) sand separator tank.

The incoming gas/liquid stream from the underground wells will pass through a sand separator, where sand, water, and residual solids are displaced and transferred to the sand separator tanks (S011). The gas stream will then pass through the line heaters (S005-S007 and S019-S022) to raise/maintain temperature. The stream will then pass through the high pressure (3 phase) separators, which will separate gas (natural gas from the separator is sent to the sales line) from liquids (condensate and produced water). The liquids will then pass through the low pressure separators, where it is heated (S023) to volatilize (flash off) lighter hydrocarbons and separate condensate and in the liquid stream. The flash gas from the liquids stream is recovered by the Vapor Recovery Unit (S024), which utilizes a natural gas-fired engine driven compressor to raise the pressure of the flash gas and route it back into the natural gas pipeline. The stabilized liquid stream (produced water and condensate) is then sent to produced fluids tank, (S013-S018).

Emissions from the storage vessels are controlled by two enclosed combustors (C001, C002). Once the tanks are filled, the contents are loaded into trucks for transport. EQT utilizes vapor balancing in the truck loading operations, which means the vapors displaced by the filling of tanker trucks (S012) are routed back into the battery of tanks and ultimately to the combustors. Facility electricity is provided by fuel cells, which do not produce air emissions.

A process flow diagram is included as Attachment D.

ATTACHMENT F

Plot Plan

ATTACHMENT F – PLOT PLAN

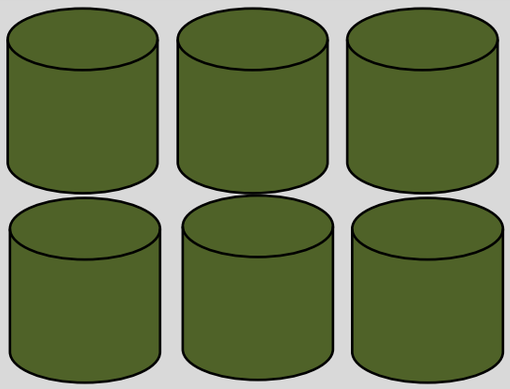
Provide an accurately scaled and detailed Plot Plan showing the locations of all emission units, emission points, and air pollution control devices. Show all emission units, affected facilities, enclosures, buildings and plant entrances and exits from the nearest public road(s) as appropriate. Note height,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

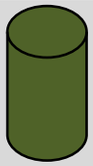
Use the following guidelines to ensure a complete Plot Plan:

- 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

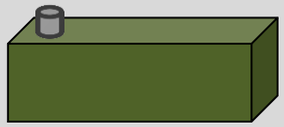
This information is required for all sources regardless of whether it is a construction, modification, or administrative update.



Tanks
400 bbl
(6)
S013-S018



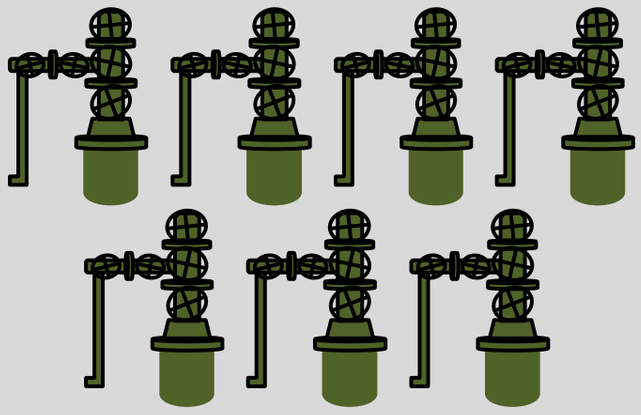
Sand Separator
Tank
140 bbl



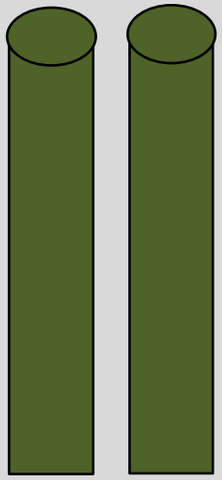
Separator Heater
(1)
1.0 MMBtu/hr

NOTE: This diagram is not to scale.
Locations and distances between surface equipment are not known at this time.

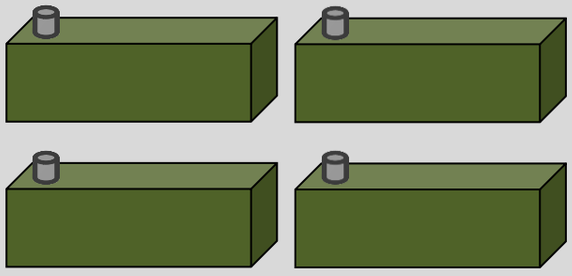
Entrance to OXF-160 Pad



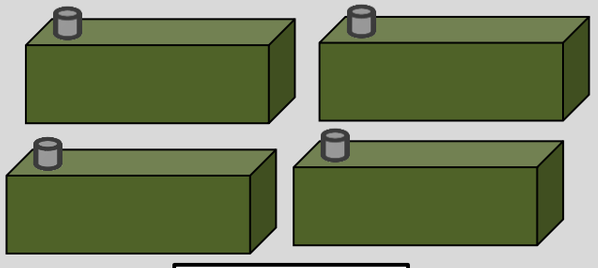
Wellheads
(7)



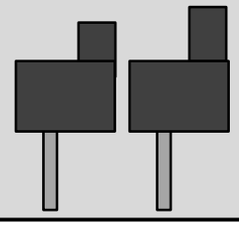
Two (2) Combustors
1 @ 19.22 MMBTU/hr
1 @ 11.66 MMBTU/hr
C001-C002



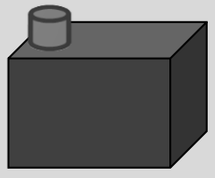
Line Heaters
2.0 MMBtu/hr
(4)



Line Heaters
(4)
1.54 MMBtu/hr
S005-S008



Thermoelectric
generators
S009-S010



VRU Engines
275 hp
S024

Attachment F

OXF-160 Well Pad Plot Plan

ATTACHMENT G

Area Map

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.

ATTACHMENT G: AREA MAP

Figure 1 - Map of OXF-160 Location

UTM Northing (KM):	4,336.958
UTM Easting (KM):	517.357
Elevation:	~1,230 ft

ATTACHMENT H

G70-D Section Applicability Form

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 Table

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]
S001	C001 – C002	Produced Fluid Storage Tank	2013	2013	400 bbl	Existing - To be removed	C001 – C002	---
S002	C001 – C002	Produced Fluid Storage Tank	2013	2013	400 bbl	Existing - To be removed	C001 – C002	---
S003	C001 – C002	Produced Fluid Storage Tank	2013	2013	400 bbl	Existing - To be removed	C001 – C002	---
S004	C001 – C002	Produced Fluid Storage Tank	2013	2013	400 bbl	Existing - To be removed	C001 – C002	---
S005	E005	Line Heater	2013	2013	1.54 MMBtu/hr	Existing; No change	None	---
S006	E006	Line Heater	2013	2013	1.54 MMBtu/hr	Existing; No change	None	---
S007	E007	Line Heater	2013	2013	1.54 MMBtu/hr	Existing; No change	None	---
S008	E008	Line Heater	2013	2013	1.54 MMBtu/hr	Existing; No change	None	---
S009	E009	Thermoelectric Generator	2013	2013	0.013 MMBtu/hr	Existing	None	---
S010	E010	Thermoelectric Generator	2013	2013	0.013 MMBtu/hr	Existing	None	---
S011	E011	Sand Separator Storage Tank	TBD	TBD	140 bbl	New	C001 – C002 (Optional)	---
S012	E012 (Uncaptured) C001–C002 (Controlled, Captured)	Liquid Loading	2013	2013	22,897,000 gal/yr	Modified; Increase throughput	C001 – C002	---
S013	C001 – C002	Produced Fluid Storage Tank	TBD	TBD	400 bbl	New	C001 – C002	---
S014	C001 – C002	Produced Fluid Storage Tank	TBD	TBD	400 bbl	New	C001 – C002	---
S015	C001 – C002	Produced Fluid Storage Tank	TBD	TBD	400 bbl	New	C001 – C002	---

S016	C001 – C002	Produced Fluid Storage Tank	TBD	TBD	400 bbl	New	C001 – C002	---
S017	C001 – C002	Produced Fluid Storage Tank	TBD	TBD	400 bbl	New	C001 – C002	---
S018	C001 – C002	Produced Fluid Storage Tank	TBD	TBD	400 bbl	New	C001 – C002	---
S019	E019	Line Heater	TBD	TBD	3.08 MMBtu/hr	New	None	---
S020	E020	Line Heater	TBD	TBD	3.08 MMBtu/hr	New	None	---
S021	E021	Line Heater	TBD	TBD	3.08 MMBtu/hr	New	None	---
S022	E022	Line Heater	TBD	TBD	3.08 MMBtu/hr	New	None	---
S023	E023	Line Heater	TBD	TBD	1.0 MMBtu/hr	New	None	---
S024	E024	VRU Engine	TBD	TBD	275 hp	New	None	---
C001	C001	Tank Combustor	2013	2013	11.66 MMBtu/hr	Existing; No change	NA	---
C002	C002	Tank Combustor	TBD	TBD	19.22 MMBtu/hr	New	NA	---

[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.
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

ATTACHMENT J – FUGITIVE EMISSIONS SUMMARY SHEET

Sources of fugitive emissions may include loading operations, equipment leaks, blowdown emissions, etc.
Use extra pages for each associated source or equipment if necessary.

Source/Equipment: Fugitive Emissions

Leak Detection Method Used	☐ Audible, visual, and olfactory (AVO) inspections	☐ Infrared (FLIR) cameras	☒ Other (please describe) Will satisfy condition 12.1.1 of the G70-D	☐ 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	11	U.S. EPA. Office of Air Quality Planning and Standards. Protocol for Equipment Leak Emission Estimates. Table 2-1. (EPA-453/R-95-017, 1995).	☐ Gas ☒ Liquid ☐ Both	2.02	0.06	0.38
Valves	☐ Yes ☒ No	369	U.S. EPA. Office of Air Quality Planning and Standards. Protocol for Equipment Leak Emission Estimates. Table 2-1. (EPA-453/R-95-017, 1995).	☒ Gas ☐ Liquid ☐ Both	3.53	0.11	36.47
Safety Relief Valves	☐ Yes ☒ No	25	U.S. EPA. Office of Air Quality Planning and Standards. Protocol for Equipment Leak Emission Estimates. Table 2-1. (EPA-453/R-95-017, 1995).	☒ Gas ☐ Liquid ☐ Both	4.08	0.13	3.59
Open Ended Lines	☐ Yes ☒ No	27	U.S. EPA. Office of Air Quality Planning and Standards. Protocol for Equipment Leak Emission Estimates. Table 2-1. (EPA-453/R-95-017, 1995).	☐ Gas ☐ Liquid ☒ Both	0.07	2.3E-3	6.03
Sampling Connections	☐ Yes ☒ No	0	N/A	☐ Gas ☐ Liquid ☐ Both	---	---	---
Connections (Not sampling)	☐ Yes ☒ No	1,626	U.S. EPA. Office of Air Quality Planning and Standards. Protocol for Equipment Leak Emission Estimates. Table 2-1. (EPA-453/R-95-017, 1995).	☐ Gas ☐ Liquid ☒ Both	4.77	0.15	17.86
Compressors	☐ Yes ☐ No	0	N/A	☐ Gas ☐ Liquid ☐ Both	---	---	---
Flanges	☐ Yes ☐ No	---	(included in connections)	☐ Gas ☐ Liquid ☐ Both	---	---	---
Other[1]	☐ Yes ☒ No	35	40 CFR 98 Subpart W	☒ Gas ☐ Liquid ☐ Both	6.1	0.19	256.27

[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.):
Pneumatic Controller count is 'Other' category. An estimate of Miscellaneous Gas Venting emissions are included in the Emission Calculations and serve to include such sources as compressor venting, pigging, vessel blowdowns and other sources.

Please indicate if there are any closed vent bypasses (include component): N/A

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

ATTACHMENT K

Gas Well Data Sheet

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?
4701706112	June 2013	June 2013	Green	Yes - OOOO
4701706113	June 2013	June 2013	Green	Yes - OOOO
4701706114	June 2013	June 2013	Green	Yes - OOOO
TBD	TBD	TBD	TBD	Yes - OOOOa
TBD	TBD	TBD	TBD	Yes - OOOOa
TBD	TBD	TBD	TBD	Yes - OOOOa
TBD	TBD	TBD	TBD	Yes - OOOOa

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 L

Storage Vessel Data Sheet

ATTACHMENT L – STORAGE VESSEL DATA SHEET

Complete this data sheet if you are the owner or operator of a storage vessel that contains condensate and/or produced water. This form must be completed for ***each*** new or modified bulk liquid storage vessel(s) that contains condensate and/or produced water. (If you have more than one (1) identical tank (i.e. 4-400 bbl condensate tanks), then you can list all on one (1) data sheet). **Include gas sample analysis, flashing emissions, working and breathing losses, USEPA Tanks, simulation software (ProMax, E&P Tanks, HYSYS, etc.), and any other supporting documents where applicable.**

The following information is REQUIRED:

☒ Composition of the representative sample used for the simulation
☒ For each stream that contributes to flashing emissions:
- ☒ Temperature and pressure (inlet and outlet from separator(s))
- ☒ Simulation-predicted composition
- ☒ Molecular weight
- ☒ Flow rate

☒ Resulting flash emission factor or flashing emissions from simulation
☐ Working/breathing loss emissions from tanks and/or loading emissions if simulation is used to quantify those emissions

Additional information may be requested if necessary.

GENERAL INFORMATION (REQUIRED)

1. Bulk Storage Area Name OXF-160 Pad	2. Tank Name Produced Fluid Tanks (water and condensate)
3. Emission Unit ID number S013-S018	4. Emission Point ID number C001-C002
5. Date Installed , Modified or Relocated *(for existing tanks)* N/A (new tanks) Was the tank manufactured after August 23, 2011 and on or before September 18, 2015? ☐ Yes ☐ No Was the tank manufactured after September 18, 2015? ☐ Yes ☐ No	6. Type of change: ☒ New construction ☐ New stored material ☐ Other ☐ Relocation
7A. Description of Tank Modification *(if applicable)* N/A	
7B. Will more than one material be stored in this tank? *If so, a separate form must be completed for each material.* ☐ Yes ☒ No	
7C. Was USEPA Tanks simulation software utilized? ☐ Yes ☒ No ***If Yes, please provide the appropriate documentation and items 8-42 below are not required.***	

TANK INFORMATION

8. Design Capacity *(specify barrels or gallons).* Use the internal cross-sectional area multiplied by internal height. 400 bbls	
9A. Tank Internal Diameter (ft.) 12	9B. Tank Internal Height (ft.) 20
10A. Maximum Liquid Height (ft.) 20	10B. Average Liquid Height (ft.) 10
11A. Maximum Vapor Space Height (ft.) 20	11B. Average Vapor Space Height (ft.) 10
12. Nominal Capacity *(specify barrels or gallons).* This is also known as "working volume". 400 bbls	
13A. Maximum annual throughput (gal/yr) **See attached emissions calculations for all throughput values**	13B. Maximum daily throughput (gal/day) **See attached emissions calculations for all throughput values**
14. Number of tank turnovers per year **See attached emissions calculations for all throughput values**	15. Maximum tank fill rate (gal/min) **See attached emissions calculations for all throughput values**
16. Tank fill method ☐ Submerged ☒ Splash ☐ Bottom Loading	
17. Is the tank system a variable vapor space system? ☐ Yes ☒ No If yes, (A) What is the volume expansion capacity of the system (gal)? (B) What are the number of transfers into the system per year?	
18. Type of tank (check all that apply): ☒ Fixed Roof ☒ vertical ☐ horizontal ☐ flat roof ☐ cone roof ☐ dome roof ☐ other (describe) ☐ External Floating Roof ☐ pontoon roof ☐ double deck roof ☐ Domed External (or Covered) Floating Roof ☐ Internal Floating Roof ☐ vertical column support ☐ self-supporting ☐ Variable Vapor Space ☐ lifter roof ☐ diaphragm ☐ Pressurized ☐ spherical ☐ cylindrical ☐ Other (describe)	

PRESSURE/VACUUM CONTROL DATA

19. Check as many as apply:

☐ Does Not Apply ☐ Rupture Disc (psig)

☐ Inert Gas Blanket of _____ ☐ Carbon Adsorption[1]

☒ Vent to Vapor Combustion Device[1] (vapor combustors, flares, thermal oxidizers, enclosed combustors)

☒ Conservation Vent (psig) ☐ Condenser[1]

0.5 oz Vacuum Setting 14.4 oz Pressure Setting

☒ Emergency Relief Valve (psig)

Vacuum Setting 14.4 oz Pressure Setting

☐ Thief Hatch Weighted ☐ Yes ☒ No

[1] Complete appropriate Air Pollution Control Device Sheet

20. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application).

Material Name	**Flashing Loss**		**Breathing Loss**		**Working Loss**		**Total Emissions Loss**		**Estimation Method[1]**
	lb/hr	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	
See attached Emissions Calculation for all values									

[1] EPA = EPA Emission Factor, MB = Material Balance, SS = Similar Source, ST = Similar Source Test, Throughput Data, O = Other (specify)

Remember to attach emissions calculations, including TANKS Summary Sheets and other modeling summary sheets if applicable.

TANK CONSTRUCTION AND OPERATION INFORMATION			
21. Tank Shell Construction: ☐ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☒ Other (describe) Welded or riveted			
21A. Shell Color: Green	21B. Roof Color: Green	21C. Year Last Painted: New	
22. Shell Condition (if metal and unlined): ☒ No Rust ☐ Light Rust ☐ Dense Rust ☐ Not applicable			
22A. Is the tank heated? ☐ Yes ☒ No	22B. If yes, operating temperature:	22C. If yes, how is heat provided to tank?	
23. Operating Pressure Range (psig): **Must be listed for tanks using VRUs with closed vent system.**			
24. Is the tank a **Vertical Fixed Roof Tank**? ☒ Yes ☐ No	24A. If yes, for dome roof provide radius (ft):	24B. If yes, for cone roof, provide slop (ft/ft): 0.06	
25. Complete item 25 for **Floating Roof Tanks** ☐ Does not apply ☒			
25A. Year Internal Floaters Installed:			
25B. Primary Seal Type *(check one):* ☐ Metallic (mechanical) shoe seal ☐ Liquid mounted resilient seal ☐ Vapor mounted resilient seal ☐ Other (describe):			
25C. Is the Floating Roof equipped with a secondary seal? ☐ Yes ☐ No			
25D. If yes, how is the secondary seal mounted? *(check one)* ☐ Shoe ☐ Rim ☐ Other (describe):			
25E. Is the floating roof equipped with a weather shield? ☐ Yes ☐ No			
25F. Describe deck fittings:			
26. Complete the following section for **Internal Floating Roof Tanks** ☒ Does not apply			
26A. Deck Type: ☐ Bolted ☐ Welded	26B. For bolted decks, provide deck construction:		
26C. Deck seam. Continuous sheet construction: ☐ 5 ft. wide ☐ 6 ft. wide ☐ 7 ft. wide ☐ 5 x 7.5 ft. wide ☐ 5 x 12 ft. wide ☐ other (describe)			
26D. Deck seam length (ft.):	26E. Area of deck (ft^2):	26F. For column supported tanks, # of columns:	26G. For column supported tanks, diameter of column:
27. Closed Vent System with VRU? ☐ Yes ☒ No			
28. Closed Vent System with Enclosed Combustor? ☒ Yes ☒ No			
SITE INFORMATION - Not Applicable: Tank calculations performed using ProMax software			
29. Provide the city and state on which the data in this section are based:			
30. Daily Avg. Ambient Temperature (°F):	31. Annual Avg. Maximum Temperature (°F):		
32. Annual Avg. Minimum Temperature (°F):	33. Avg. Wind Speed (mph):		
34. Annual Avg. Solar Insulation Factor (BTU/ft^2-day):	35. Atmospheric Pressure (psia):		
LIQUID INFORMATION - Not Applicable: Tank calculations performed using ProMax software			
36. Avg. daily temperature range of bulk liquid (°F):	36A. Minimum (°F):	36B. Maximum (°F):	
37. Avg. operating pressure range of tank (psig):	37A. Minimum (psig):	37B. Maximum (psig):	
38A. Minimum liquid surface temperature (°F):	38B. Corresponding vapor pressure (psia):		
39A. Avg. liquid surface temperature (°F):	39B. Corresponding vapor pressure (psia):		
40A. Maximum liquid surface temperature (°F):	40B. Corresponding vapor pressure (psia):		
41. Provide the following for each liquid or gas to be stored in the tank. Add additional pages if necessary.			
41A. Material name and composition:			
41B. CAS number:			
41C. Liquid density (lb/gal):			
41D. Liquid molecular weight (lb/lb-mole):			
41E. Vapor molecular weight (lb/lb-mole):			
41F. Maximum true vapor pressure (psia):			
41G. Maximum Reid vapor pressure (psia):			
41H. Months Storage per year. From: To:			
42. Final maximum gauge pressure and temperature prior to transfer into tank used as inputs into flashing emission calculations.			

GENERAL INFORMATION (REQUIRED)

1. Bulk Storage Area Name OXF-160 Pad	2. Tank Name Sand Separator Tank
3. Emission Unit ID number S011	4. Emission Point ID number E011
5. Date Installed , Modified or Relocated *(for existing tanks)* Was the tank manufactured after August 23, 2011? ☒ Yes ☐ No	6. Type of change: ☒ New construction ☐ New stored material ☐ Other (Low Pressure Tower) ☐ Relocation
7A. Description of Tank Modification *(if applicable)* N/A	
7B. Will more than one material be stored in this tank? *If so, a separate form must be completed for each material.* ☐ Yes ☒ No	
7C. Was USEPA Tanks simulation software utilized? ☐ Yes ☒ No ***If Yes, please provide the appropriate documentation and items 8-42 below are not required.***	

TANK INFORMATION

8. Design Capacity *(specify barrels or gallons).* Use the internal cross-sectional area multiplied by internal height. 140 bbls	
9A. Tank Internal Diameter (ft.) 10	9B. Tank Internal Height (ft.) 10
10A. Maximum Liquid Height (ft.) 10	10B. Average Liquid Height (ft.) 5
11A. Maximum Vapor Space Height (ft.) 10	11B. Average Vapor Space Height (ft.) 5
12. Nominal Capacity *(specify barrels or gallons).* This is also known as "working volume". 140 bbls	
13A. Maximum annual throughput (gal/yr) **See attached emissions calculations for all throughput values**	13B. Maximum daily throughput (gal/day) **See attached emissions calculations for all throughput values**
14. Number of tank turnovers per year **See attached emissions calculations for all throughput values**	15. Maximum tank fill rate (gal/min) **See attached emissions calculations for all throughput values**
16. Tank fill method ☐ Submerged ☒ Splash ☐ Bottom Loading	
17. Is the tank system a variable vapor space system? ☐ Yes ☒ No If yes, (A) What is the volume expansion capacity of the system (gal)? (B) What are the number of transfers into the system per year?	
18. Type of tank (check all that apply): ☒ Fixed Roof ☐ vertical ☒ horizontal ☐ flat roof ☐ cone roof ☐ dome roof ☐ other (describe) ☐ External Floating Roof ☐ pontoon roof ☐ double deck roof ☐ Domed External (or Covered) Floating Roof ☐ Internal Floating Roof ☐ vertical column support ☐ self-supporting ☐ Variable Vapor Space ☐ lifter roof ☐ diaphragm ☐ Pressurized ☐ spherical ☐ cylindrical	

PRESSURE/VACUUM CONTROL DATA

19. Check as many as apply:

☒ Does Not Apply ☐ Rupture Disc (psig)

☐ Inert Gas Blanket of _____ ☐ Carbon Adsorption[1]

☐ Vent to Vapor Combustion Device[1] (vapor combustors, flares, thermal oxidizers, enclosed combustors)

☐ Conservation Vent (psig) ☐ Condenser[1]

Vacuum Setting Pressure Setting

☐ Emergency Relief Valve (psig)

Vacuum Setting Pressure Setting

☐ Thief Hatch Weighted ☐ Yes ☐ No

[1] Complete appropriate Air Pollution Control Device Sheet

20. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application).

Material Name	Flashing Loss		Breathing Loss		Working Loss		Total Emissions Loss		Estimation Method[1]
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	
See attached Emissions Calculation for all values									

[1] EPA = EPA Emission Factor, MB = Material Balance, SS = Similar Source, ST = Similar Source Test, Throughput Data, O = Other (specify)
Remember to attach emissions calculations, including TANKS Summary Sheets and other modeling summary sheets if applicable.

TANK CONSTRUCTION AND OPERATION INFORMATION

21. Tank Shell Construction:
☐ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☒ Other (describe) Welded

21A. Shell Color: Gray	21B. Roof Color: Gray	21C. Year Last Painted: New

22. Shell Condition (if metal and unlined):
☒ No Rust ☐ Light Rust ☐ Dense Rust ☐ Not applicable

22A. Is the tank heated? ☐ Yes ☒ No	22B. If yes, operating temperature:	22C. If yes, how is heat provided to tank?

23. Operating Pressure Range (psig):
Must be listed for tanks using VRUs with closed vent system.

24. Is the tank a **Vertical Fixed Roof Tank**? ☐ Yes ☒ No	24A. If yes, for dome roof provide radius (ft):	24B. If yes, for cone roof, provide slop (ft/ft):

25. Complete item 25 for **Floating Roof Tanks** ☐ Does not apply ☒

25A. Year Internal Floaters Installed:

25B. Primary Seal Type *(check one):* ☐ Metallic (mechanical) shoe seal ☐ Liquid mounted resilient seal ☐ Vapor mounted resilient seal ☐ Other (describe):

25C. Is the Floating Roof equipped with a secondary seal? ☐ Yes ☐ No

25D. If yes, how is the secondary seal mounted? *(check one)* ☐ Shoe ☐ Rim ☐ Other (describe):

25E. Is the floating roof equipped with a weather shield? ☐ Yes ☐ No

25F. Describe deck fittings:

26. Complete the following section for **Internal Floating Roof Tanks** ☒ Does not apply

26A. Deck Type: ☐ Bolted ☐ Welded	26B. For bolted decks, provide deck construction:

26C. Deck seam. Continuous sheet construction:
☐ 5 ft. wide ☐ 6 ft. wide ☐ 7 ft. wide ☐ 5 x 7.5 ft. wide ☐ 5 x 12 ft. wide ☐ other (describe)

26D. Deck seam length (ft.):	26E. Area of deck (ft^2):	26F. For column supported tanks, # of columns:	26G. For column supported tanks, diameter of column:

27. Closed Vent System with VRU? ☐ Yes ☒ No

28. Closed Vent System with Enclosed Combustor? ☐ Yes ☒ No

SITE INFORMATION - Not Applicable: Tank calculations performed using E&P Tank software

29. Provide the city and state on which the data in this section are based:

30. Daily Avg. Ambient Temperature (°F):	31. Annual Avg. Maximum Temperature (°F):
32. Annual Avg. Minimum Temperature (°F):	33. Avg. Wind Speed (mph):
34. Annual Avg. Solar Insulation Factor (BTU/ft^2-day):	35. Atmospheric Pressure (psia):

LIQUID INFORMATION - Not Applicable: Tank calculations performed using E&P Tank software

36. Avg. daily temperature range of bulk liquid (°F):	36A. Minimum (°F):	36B. Maximum (°F):

37. Avg. operating pressure range of tank (psig):	37A. Minimum (psig):		37B. Maximum (psig):
38A. Minimum liquid surface temperature (°F):		38B. Corresponding vapor pressure (psia):	
39A. Avg. liquid surface temperature (°F):		39B. Corresponding vapor pressure (psia):	
40A. Maximum liquid surface temperature (°F):		40B. Corresponding vapor pressure (psia):	
41. Provide the following for each liquid or gas to be stored in the tank. Add additional pages if necessary.			
41A. Material name and composition:			
41B. CAS number:			
41C. Liquid density (lb/gal):			
41D. Liquid molecular weight (lb/lb-mole):			
41E. Vapor molecular weight (lb/lb-mole):			
41F. Maximum true vapor pressure (psia):			
41G. Maximum Reid vapor pressure (psia):			
41H. Months Storage per year. From: To:			
42. Final maximum gauge pressure and temperature prior to transfer into tank used as inputs into flashing emission calculations.			

STORAGE TANK DATA TABLE

List all deminimis storage tanks (i.e. lube oil, glycol, diesel etc.)

Source ID #[1]	Status[2]	Content[3]	Volume[4]
Not Applicable			

1. Enter the appropriate Source Identification Numbers (Source ID #) for each storage tank located at the well site. Tanks should be designated T01, T02, T03, etc.
2. Enter storage tank Status using the following:
   - EXIST Existing Equipment
   - NEW Installation of New Equipment
   - REM Equipment Removed
3. Enter storage tank content such as condensate, pipeline liquids, glycol (DEG or TEG), lube oil, diesel, mercaptan etc.
4. Enter the maximum design storage tank volume in gallons.

ATTACHMENT M

Heaters Data Sheet

ATTACHMENT M – SMALL HEATERS AND REBOILERS NOT SUBJECT TO 40CFR60 SUBPART DC
DATA SHEET

Complete this data sheet for each small heater and reboiler not subject to 40CFR60 Subpart Dc at the facility. ***The Maximum Design Heat Input (MDHI) must be less than 10 MMBTU/hr.***

Emission Unit ID#[1]	Emission Point ID#[2]	Emission Unit Description (manufacturer, model #)	Year Installed/ Modified	Type[3] and Date of Change	Maximum Design Heat Input (MMBTU/hr)[4]	Fuel Heating Value (BTU/scf)[5]
S005	E005	Line Heater	2013	Existing; No change	1.54	~1,240
S006	E006	Line Heater	2013	Existing; No change	1.54	~1,240
S007	E007	Line Heater	2013	Existing; No change	1.54	~1,240
S008	E008	Line Heater	2013	Existing; No change	1.54	~1,240
S009	E009	Thermoelectric Generator	2013	Existing	0.013	~1,240
S010	E010	Thermoelectric Generator	2013	Existing	0.013	~1,240
S019	E019	Line Heater	TBD	New	3.08	~1,240
S020	E020	Line Heater	TBD	New	3.08	~1,240
S021	E021	Line Heater	TBD	New	3.08	~1,240
S022	E022	Line Heater	TBD	New	3.08	~1,240
S023	E023	Line Heater	TBD	New	1.0	~1,240

1 Enter the appropriate Emission Unit (or Source) identification number for each fuel burning unit located at the production pad. Gas Producing Unit Burners should be designated GPU-1, GPU-2, etc. Heater Treaters should be designated HT-1, HT-2, etc. Heaters or Line Heaters should be designated LH-1, LH-2, etc. For sources, use 1S, 2S, 3S…or other appropriate designation. Enter glycol dehydration unit Reboiler Vent data on the Glycol Dehydration Unit Data Sheet.

2 Enter the appropriate Emission Point identification numbers for each fuel burning unit located at the production pad. Gas Producing Unit Burners should be designated GPU-1, GPU-2, etc. Heater Treaters should be designated HT-1, HT-2, etc. Heaters or Line Heaters should be designated LH-1, LH-2, etc. For emission points, use 1E, 2E, 3E…or other appropriate designation.

3 New, modification, removal

4 Enter design heat input capacity in MMBtu/hr.

5 Enter the fuel heating value in BTU/standard cubic foot.

ATTACHMENT N

Engines Data Sheet *(Not Applicable)*

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]	S024		
Engine Manufacturer/Model	Caterpillar/G3406		
Manufacturers Rated bhp/rpm	275		
Source Status[2]	NS		
Date Installed/ Modified/Removed/Relocated[3]	TBD		
Engine Manufactured /Reconstruction Date[4]	> January 2011		
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		
APCD Type[7]	NSCR		
Fuel Type[8]	PQNG		
H_2S (gr/100 scf)	0		
Operating bhp/rpm	275		
BSFC (BTU/bhp-hr)	7,418		
Hourly Fuel Throughput	1,943 ft^3/hr NA gal/hr	ft^3/hr gal/hr	ft^3/hr gal/hr
Annual Fuel Throughput (Must use 8,760 hrs/yr unless emergency generator)	17 $MMft^3$/yr NA gal/yr	$MMft^3$/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]**
40 CFR 60 Subpart JJJJJ	NO_x	0.61	2.66				
40 CFR 60 Subpart JJJJJ	CO	1.21	5.31				
40 CFR 60 Subpart JJJJJ	VOC	0.47	2.04				
AP-42	SO_2	<0.01	<0.01				
AP-42	PM_{10}	0.04	0.17				
AP-42	Formaldehyde	0.04	0.17				
AP-42	Total HAPs	0.07	0.29				
40 CFR Part 98 Subpart C	GHG (CO_2e)	316	1,385				

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# S024, use extra pages as necessary)

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: Sequential multi-part fuel injection

Manufacturer: Caterpillar	Model #: G3408
Design Operating Temperature: 1,600 ºF	Design gas volume: scfm
Service life of catalyst: 5,000	Provide manufacturer data? ☐Yes ☒ No
Volume of gas handled: 444.9 acfm at 1,600 ºF	Operating temperature range for NSCR/Ox Cat: From ºF to ºF
Reducing agent used, if any:	Ammonia slip (ppm):

Pressure drop against catalyst bed (delta P): 6 inches of H_2O

Provide description of warning/alarm system that protects unit when operation is not meeting design conditions:

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)?

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,

ATTACHMENT O

Truck Loading Data Sheet

ATTACHMENT O – TANKER TRUCK/RAIL CAR LOADING DATA SHEET

Complete this data sheet for each new or modified bulk liquid transfer area or loading rack at the facility. This is to be used for bulk liquid transfer operations to tanker trucks/rail cars. Use extra pages if necessary.

Truck/Rail Car Loadout Collection Efficiencies

The following applicable capture efficiencies of a truck/rail car loadout are allowed:

- For tanker trucks/rail cars passing the MACT level annual leak test – 99.2%
- For tanker trucks/rail cars passing the NSPS level annual leak test – 98.7%
- For tanker trucks/rail cars not passing one of the annual leak tests listed above – 70%

Compliance with this requirement shall be demonstrated by keeping records of the applicable MACT or NSPS Annual Leak Test certification for ***every*** truck and railcar loaded/unloaded. This requirement can be satisfied if the trucking/rail car company provided certification that its entire fleet was compliant. This certification must be submitted in writing to the Director of the DAQ. These additional requirements must be noted in the Registration Application.

Emission Unit ID#: S012	Emission Point ID#: C001-C002, E012	Year Installed/Modified: N/A
Emission Unit Description: Uncaptured losses from loading of produced fluids into tanker trucks		
Loading Area Data		
Number of Pumps: 1	Number of Liquids Loaded: 1	Max number of trucks/rail cars loading at one (1) time: 1
Are tanker trucks/rail cars pressure tested for leaks at this or any other location? ☐ Yes ☒ No ☐ Not Required If Yes, Please describe:		
Provide description of closed vent system and any bypasses. Trucks utilize vapor recovery lines to route displaced vapors back into battery of tanks.		
Are any of the following truck/rail car loadout systems utilized? ☐ Closed System to tanker truck/rail car passing a MACT level annual leak test? ☐ Closed System to tanker truck/rail car passing a NSPS level annual leak test? ☒ Closed System to tanker truck/rail car not passing an annual leak test and has vapor return?		

Projected Maximum Operating Schedule (for rack or transfer point as a whole)

Time	Jan – Mar	Apr - Jun	Jul – Sept	Oct - Dec
Hours/day	Varies	Varies	Varies	Varies
Days/week	7	7	7	7

Bulk Liquid Data (use extra pages as necessary)

Liquid Name	Produced Fluids		
Max. Daily Throughput (1000 gal/day)	See attached emissions calculations for all throughput values		
Max. Annual Throughput (1000 gal/yr)	See attached emissions calculations for all throughput values		
Loading Method[1]	SP		
Max. Fill Rate (gal/min)	Varies		
Average Fill Time (min/loading)	Varies		
Max. Bulk Liquid Temperature (°F)	See ProMax results		
True Vapor Pressure[2]	See ProMax results		
Cargo Vessel Condition[3]	U		
Control Equipment or Method[4]	VB, ECD (captured loading losses)		

Max. Collection Efficiency (%)		70		
Max. Control Efficiency (%)		98		
Max.VOC Emission Rate	Loading (lb/hr)	See attached emission calculations for breakdown		
	Annual (ton/yr)	See attached emission calculations for breakdown		
Max.HAP Emission Rate	Loading (lb/hr)	See attached emission calculations for breakdown		
	Annual (ton/yr)	See attached emission calculations for breakdown		
Estimation Method[5]		AP-42 Section 5.2 Methodology (via ProMax)		

1 BF Bottom Fill SP Splash Fill SUB Submerged Fill

2 At maximum bulk liquid temperature

3 B Ballasted Vessel C Cleaned U Uncleaned (dedicated service)
O Other (describe)

4 List as many as apply (complete and submit appropriate Air Pollution Control Device Sheets)
CA Carbon Adsorption VB Dedicated Vapor Balance (closed system)
ECD Enclosed Combustion Device F Flare
TO Thermal Oxidization or Incineration

5 EPA EPA Emission Factor in AP-42 MB Material Balance
TM Test Measurement based upon test data submittal O Other (describe)

ATTACHMENT P

Glycol Dehydrator Data Sheet *(Not Applicable)*

ATTACHMENT P – GLYCOL DEHYDRATION UNIT DATA SHEET - NOT APPLICABLE

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:	Model:
Max. Dry Gas Flow Rate: mmscf/day	Reboiler Design Heat Input: MMBTU/hr
Design Type: ☐ TEG ☐ DEG ☐ EG	Source Status[1]:
Date Installed/Modified/Removed[2]:	Regenerator Still Vent APCD/ERD[3]:
Control Device/ERD ID#[3]:	Fuel HV (BTU/scf):
H_2S Content (gr/100 scf):	Operation (hours/year):
Pump Rate (gpm):	
Water Content (wt %) in: Wet Gas:	Dry Gas:

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 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 (%)

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)
	Reboiler Vent		NO_x		
			CO		
			VOC		
			SO_2		
			PM_{10}		

			GHG (CO_2e)		
	Glycol Regenerator Still Vent	GRI-GlyCalc™	VOC		
		GRI-GlyCalc™	Benzene		
		GRI-GlyCalc™	Toluene		
		GRI-GlyCalc™	Ethylbenzene		
		GRI-GlyCalc™	Xylenes		
		GRI-GlyCalc™	n-Hexane		
	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.

ATTACHMENT Q

Pneumatic Controller Data Sheet

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 Controller Data Sheet

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 Data Sheet

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: **Not Applicable**	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#: **C001 (existing; no change);**	Installation Date: ☐ New ☐ Modified ☐ Relocated
Maximum Rated Total Flow Capacity ~7,850 scfh 188,000 scfd	Maximum Design Heat Input (from mfg. spec sheet) 11.66 MMBTU/hr Design Heat Content 1,500 BTU/scf

Control Device Information

Type of Vapor Combustion Control?

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

Manufacturer: LEED Fabrication Model: Enclosed Combustor 48”	Hours of operation per year? 8,760

List the emission units whose emissions are controlled by this vapor control device (Emission Point ID# E013-E018, E012)

Emission Unit ID#	Emission Source Description	Emission Unit ID#	Emission Source Description
S013-S018	Produced Fluid Tanks		
S012	Liquid Loading		

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	~25 feet	4 feet	☐ Yes ☐ No ☒ N/A Provide determination.

Waste Gas Information

Maximum Waste Gas Flow Rate 130 (scfm)	Heat Value of Waste Gas Stream Varies BTU/ft^3	Exit Velocity of the Emissions Stream Varies (ft/s)

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

Pilot Gas Information

Number of Pilot Lights 1	Fuel Flow Rate to Pilot Flame per Pilot ~50 scfh	Heat Input per Pilot 0.05 BTU/hr	Will automatic re-ignition be used? ☐ Yes ☒ No

If automatic re-ignition is used, please describe the method.

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).* See attached information on unit

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.

VAPOR COMBUSTION
(Including Enclosed Combustors)

General Information

Control Device ID#: **C002 (new)**	Installation Date: ☒ New ☐ Modified ☐ Relocated
Maximum Rated Total Flow Capacity ~12,812.5 scfh 307,500 scfd	Maximum Design Heat Input (from mfg. spec sheet) 19.22 MMBTU/hr Design Heat Content 1,500 BTU/scf

Control Device Information

Type of Vapor Combustion Control?

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

Manufacturer: LEED Fabrication Model: Enclosed Combustor 60”	Hours of operation per year? 8,760

List the emission units whose emissions are controlled by this vapor control device (Emission Point ID# E013-E018, E012)

Emission Unit ID#	Emission Source Description	Emission Unit ID#	Emission Source Description
S013-S018	Produced Fluid Tanks		
S012	Liquid Loading		

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	~25 feet	4 feet	☐ Yes ☐ No ☒ N/A Provide determination.

Waste Gas Information

Maximum Waste Gas Flow Rate 130 (scfm)	Heat Value of Waste Gas Stream Varies BTU/ft^3	Exit Velocity of the Emissions Stream Varies (ft/s)

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

Pilot Gas Information

Number of Pilot Lights 1	Fuel Flow Rate to Pilot Flame per Pilot ~50 scfh	Heat Input per Pilot 0.05 MMBTU/hr	Will automatic re-ignition be used? ☐ Yes ☒ No

If automatic re-ignition is used, please describe the method.

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).* See attached information on unit

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.

CONDENSER – Not Applicable		
General Information		
Control Device ID#:	Installation Date: ☐ New ☐ Modified ☐ Relocated	
Manufacturer:	Model:	Control Device Name:
Control Efficiency (%):		
Manufacturer's required temperature range for control efficiency. °F		
Describe the warning and/or alarm system that protects against operation when unit is not meeting the design requirements:		
Describe all operating ranges and maintenance procedures required by the manufacturer to maintain the warranty.		
Additional information attached? ☐ Yes ☐ No Please attach copies of manufacturer's data sheets.		
Is condenser routed to a secondary APCD or ERD? ☐ Yes ☐ No		

ADSORPTION SYSTEM – Not Applicable		
General Information		
Control Device ID#:	Installation Date: ☐ New ☐ Modified ☐ Relocated	
Manufacturer:	Model:	Control Device Name:
Design Inlet Volume: scfm	Adsorbent charge per adsorber vessel and number of adsorber vessels:	
Length of Mass Transfer Zone supplied by the manufacturer:	Adsorber diameter: ft Adsorber area: ft^2	
Adsorbent type and physical properties:	Overall Control Efficiency (%):	
Working Capacity of Adsorbent (%):		
Operating Parameters		
Inlet volume: scfm @ °F		
Adsorption time per adsorption bed (life expectancy):	Breakthrough Capacity (lbs of VOC/100 lbs of adsorbent):	
Temperature range of carbon bed adsorber. °F - °F		
Control Device Technical Data		
Pollutants Controlled	Manufacturer's Guaranteed Control Efficiency (%)	
Describe the warning and/or alarm system that protects against operation when unit is not meeting the design requirements:		
Has the control device been tested by the manufacturer and certified?		
Describe all operating ranges and maintenance procedures required by the manufacturer to maintain the warranty.		
Additional information attached? ☐ Yes ☐ No Please attach copies of manufacturer's data sheets, drawings, and performance testing.		

VAPOR RECOVERY UNIT

General Information

Emission Unit ID#: S024	Installation Date: ☒ New ☐ Modified ☐ Relocated

Device Information

Manufacturer: Caterpillar
Model: G3406

List the emission units whose emissions are controlled by this vapor recovery unit (Emission Point ID# NA)

Emission Unit ID#	Emission Source Description	Emission Unit ID#	Emission Source Description
NA	Low Pressure Separator		

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

Additional information attached? ☒ Yes ☐ No
Please attach copies of manufacturer's data sheets, drawings, and performance testing.

The registrant may claim a capture and control efficiency of 95 % (which accounts for 5% downtime) for the vapor recovery unit.

The registrant may claim a capture and control efficiency of 98% if the VRU has a backup flare that meet the requirements of Section 8.1.2 of this general permit.

The registrant may claim a capture and control efficiency of 98% if the VRU has a backup VRU.

		Item/Tag No.:		Page	1	of	2
		Project No.:		Revision:	B		
		Project:		Date:	27 February 2014		
	Enviromental Control Equipment Data Sheet			By:	JS		
		P.O. No.:	-	Checked:	SG		
		RFQ No.:	-	Approved:	MS		
	Client:	Ref. P&ID:	-				
	Site:			Supplier:	LEED FABRICATION		
	Unit/Lease:	Remarks:	-	Model No.:	L30-0011-00		

GENERAL

1	Design Code:		NDE:	LEED Fabrication Standards
2	Service:		Customer Specs:	☐ Yes
3	Description:	Standard Dual Stage 48 High Efficiency Combustor		☑ No

PROCESS DATA

	Gas Composition:	mol %	Process Conditions: Variable	Value	Units
4	Methane		Flow Rate	Up to 140	Mscfd
5	Ethane		Pressure	Up to 12	oz/in2
6	Propane		Temperature		°F
7	I-Butane		Molecular Weight		
8	n-Butane		Process/Waste Stream	☑ Gas	☐ Liquid
9	I-Pentane		Detailed Process Description / Process Notes:		
10	n-Pentane		1. Turndown 10:1. Based on an expected normal operating rate indicated above.		
11	n-Hexane		2. DRE: 98 % operating at design conditions		
12	CO2		3. Burner Pressure Drop: Min. 0.10 oz/in2		
13	N2				
14	Helium				
15	H_2O				
16	C7				
17	C8				
18	C9				
19	C10				
20	C11+				
21	TOTAL				

	Other Components:	PPMV	Available Utilities:	
22	H2S		Fuel / Pilot Gas	Min. 30psig Natural Gas /Propane 40-50 SCFH
23	Benzene		Instrument Air	NA
24	Toluene		Power	120 V / 60 Hz or Solar Power
25	E-Benzene		Steam	NA
26	Xylene		Purge Gas	

DESIGN DATA

27	Ambient Temperatures:		Noise Performance Requirements:	Under 85 dBA
28	Low, °F	-20	Structural Design Code:	
29	High, °F	120	Wind Design Code:	ASCE
30	Design Conditions: Pressure/Temperature			
31	Max. Relative Humidity, %	90	Pressure/Speed	100 mph
32	Elevation (ASL), ft		Category	
33	Area Classification:	Class I Div 2	Seismic Design Code:	
34	Electrical Design Code:	NEC	Location	

EQUIPMENT SPECIFICATION

35	Type:	☐ Elevated ☑ Enclosed	Equipment Design:	
36		☐ Above Ground	Component	Material / Size / Rating / Other
37		☑ Stack ☐ Multiple Stack	Burner	
38		☐ Portable / Trailer	Burner Tip / Assist Gas Burner	304 SS
39			Burner Body	Carbon Steel
40	Smokeless By:	☐ Steam ☐ Assist Air	Pilot	
41		☐ Gas Assist ☑ Staging	Pilot Tip	304 SS
42			Pilot Line(s)	Carbon Steel
43	Stack:	☑ Self Supporting	Firebox / Stack	
44	Flare Burner:	☐ Non-Smokeless ☑ Smokeless ☐ Gas Assist	Shell	Carbon Steel
45	Pilot:	☑ Intermittent ☐ Continuous	Piping	Carbon Steel
46	Pilot Air Inspirator:	☑ Local ☐ Remote	Nozzles	Carbon Steel
47	Pilot Flame Control:	☐ No ☑ Yes (Thermocouple)	Flanges	Carbon Steel
48			Insulation	Blanket
49	Pilot Ignition:	☐ Flamefront Generator ☑ Inspirating Ignitor	Insulation Pins	304 SS
50		☐ Electronic ☑ Automatic ☐ Manual	Refractory	NA
51		☐ With Pilot Flame Control	Refractory Anchors	NA
52		☐ With Auto Pilot Re-Ignition	Ladders and Platforms	NA
53			Stack Sample Connections	Per EPA requirements
54	Pilot Ignition Backup:	☐ Manual Specify: i.e Piezo-Electric	Sight Glass	2
55		☐ Battery Pack	Other	

Environmental Control Equipment
Data Sheet

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Project:		**Date:**	27 February 2014		
		By:	JS		
P.O. No.:	-	**Checked:**	SG		
RFQ No.:	-	**Approved:**	MS		
Client:		**Ref. P&ID:**	-		
Site:		**Supplier:**	LEED FABRICATION		
Unit/Lease:		**Remarks:**	-	**Model No.:**	L30-0011-00

EQUIPMENT SPECIFICATION

Flame Detection: ☐ Thermocouple ☑ Ionization Rod ☐ UV Scanner

General Configuration:

Auxiliary Equipment	
Valves	NA
Blowers	NA
Dampers	NA
Inlet KO / Liquid Seal	NA
Flame / Detonation Arrestor	Yes
Instrumentation & Controls	
Solenoids / Shut-Off Valves	Check with Sales for available config.
Flow Meters	NA
Calorimeter	NA
Pressure Switches/Transmitters	NA
Thermocouples	Check with Sales for available config.
Temperature Switches/Transmitters	NA
BMS	Check with Sales for available config.
CEMS	NA
Other	NA

FABRICATION AND INSPECTION

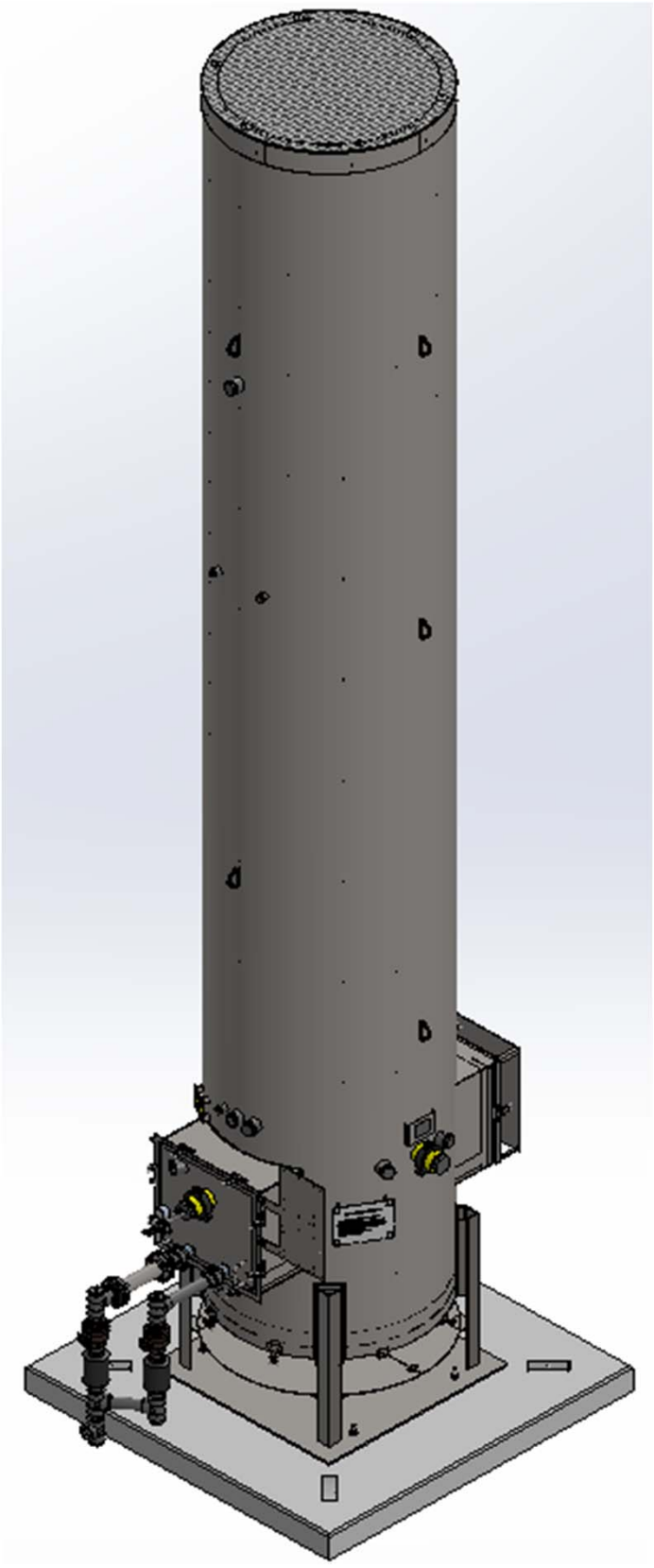
Special requirements	☐ Skid Mounted ☑ Concrete Pad ☐ Other
Inspection	☑ Vendor Standard ☐ Other. Specify:
Material Certification	☑ Vendor Standard ☐ MTR ☐ Certificate of Compliance ☐ Other (Specify):
NDE	☑ Vendor Standard ☐ Radiography. Specify: ☐ Ultrasonic. Specify: ☐ Liquid Penetrant. ☐ Magnetic Particles. ☐ PMI. Specify: ☐ Other. Specify:
Surface Preparation	☑ Vendor Standard ☐ Other. Specify:
Paint System	☑ Vendor Standard ☐ Other. Specify:
Finished Color	☑ Vendor Standard ☐ Other. Specify:

Equipment Info	
Component	**Weight / Dimensions**
Burner	
Burner Assembly	
Stack	
Stack Assembly	48 " OD x 25 ' H
Pilot Tip	
Pilot Line(s)	
Stack Assembly	
Auxiliary Equipment	
Blowers	
Inlet KO / Liquid Seal	
Flame / Detonation Arrestor	
Skid	
Instrumentation & Controls	
BMS	
Control Panel	

Additional Notes:

		Item/Tag No.:		Page	3	of	3
		Project No.:		Revision:	B		
		Project:		Date:	27 February 2014		
				By:	JS		
Environmental Control Equipment Data Sheet		P.O. No.:	-	Checked:	SG		
		RFQ No.:	-	Approved:	MS		
Client:		Ref. P&ID:	-				
Site:				Supplier:	LEED FABRICATION		
Unit/Lease:		Remarks:	-	Model No.:	L30-0011-00		

GENERAL ARRANGEMENT



		Item/Tag No.:		Page	1	of	3
		Project No.:		Revision:	A		
		Project:		Date:	10 November 2014		
	Enviromental Control Equipment Data Sheet			By:	JS		
		P.O. No.:	-	Checked:	SG		
		RFQ No.:	-	Approved:	MS		
	Client:	Ref. P&ID:	-				
	Site:			Supplier:	LEED FABRICATION		
	Unit/Lease:	Remarks:	-	Model No.:	L30-0028-00		

GENERAL

1	Design Code:		NDE:	LEED Fabrication Standards
2	Service:		Customer Specs:	☐ Yes
3	Description:	Standard Dual Stage 60 High Efficiency Combustor		☑ No

PROCESS DATA

	Gas Composition:	mol %	Process Conditions: Variable	Value	Units
4	Methane		Flow Rate	Up to 300	Mscfd
5	Ethane		Pressure	Up to 12	oz/in2
6	Propane		Temperature		°F
7	I-Butane		Molecular Weight		
8	n-Butane		Process/Waste Stream	☑ Gas	☐ Liquid
9	I-Pentane		Detailed Process Description / Process Notes:		
10	n-Pentane		1. Turndown 10:1. Based on an expected normal operating rate indicated above.		
11	n-Hexane		2. DRE: 98 % operating at design conditions		
12	CO2		3. Burner Pressure Drop: Min. 0.12 oz/in2		
13	N2		4. Gas mixture heating value estimated to be 1500 BTU/SCF unless specified by customer		
14	Helium				
15	H_2O				
16	C7				
17	C8				
18	C9				
19	C10				
20	C11+				
21	TOTAL				

	Other Components:	PPMV	Available Utilities:	
22	H2S		Fuel / Pilot Gas	Min. 30psig Natural Gas /Propane 40-50 SCFH
23	Benzene		Instrument Air	NA
24	Toluene		Power	120 V / 60 Hz or Solar Power
25	E-Benzene		Steam	NA
26	Xylene		Purge Gas	

DESIGN DATA

27	Ambient Temperatures:		Noise Performance Requirements:	Under 85 dBA
28	Low, °F	-20	Structural Design Code:	
29	High, °F	120	Wind Design Code:	ASCE
30	Design Conditions: Pressure/Temperature			
31	Max. Relative Humidity, %	90	Pressure/Speed	100 mph
32	Elevation (ASL), ft		Category	
33	Area Classification:	Class I Div 2	Seismic Design Code:	
34	Electrical Design Code:	NEC	Location	

EQUIPMENT SPECIFICATION

35	Type:	☐ Elevated	☑ Enclosed		Equipment Design:		
36		☐ Above Ground			Component	Material / Size / Rating / Other	
37		☑ Stack	☐ Multiple Stack		Burner		
38		☐ Portable / Trailer			Burner Tip / Assist Gas Burner	Stainless Steel	
39					Burner Body	Carbon Steel	
40	Smokeless By:	☐ Steam	☐ Assist Air		Pilot		
41		☐ Gas Assist	☑ Staging		Pilot Tip	Stainless Steel	
42					Pilot Line(s)	Carbon Steel	
43	Stack:	☑ Self Supporting			Firebox / Stack		
44	Flare Burner:	☐ Non-Smokeless	☑ Smokeless	☐ Gas Assist	Shell	Carbon Steel	
45	Pilot:	☑ Intermittent	☐ Continuous		Piping	Carbon Steel	
46	Pilot Air Inspirator:	☑ Local	☐ Remote		Nozzles	Carbon Steel	
47	Pilot Flame Control:	☐ No	☑ Yes (Thermocouple)		Flanges	Carbon Steel	
48					Insulation	Blanket	
49	Pilot Ignition:	☐ Flamefront Generator	☑ Inspirating Ignitor		Insulation Pins	Stainless Steel	
50		☐ Electronic	☑ Automatic	☐ Manual	Refractory	NA	
51		☐ With Pilot Flame Control			Refractory Anchors	NA	
52		☐ With Auto Pilot Re-Ignition			Ladders and Platforms	NA	
53					Stack Sample Connections	Per EPA requirements	
54	Pilot Ignition Backup:	☐ Manual	Specify: i.e Piezo-Electric		Sight Glass	2	
55		☐ Battery Pack			Other		

		Item/Tag No.:		Page	2	of	3
		Project No.:		Revision:	A		
		Project:		Date:	10 November 2014		
				By:	JS		
	Environmental Control Equipment	P.O. No.:	-	Checked:	SG		
	Data Sheet	RFQ No.:	-	Approved:	MS		
	Client:	Ref. P&ID:	-				
	Site:			Supplier:	LEED FABRICATION		
	Unit/Lease:	Remarks:	-	Model No.:	L30-0028-00		

EQUIPMENT SPECIFICATION

56	**Flame Detection:**	☐ Thermocouple ☑ Ionization Rod	**Auxiliary Equipment**		
57		☐ UV Scanner	Valves	NA	
58	**General Configuration:**		Blowers	NA	
59			Dampers	NA	
60			Inlet KO / Liquid Seal	NA	
61			Flame / Detonation Arrestor	Yes	
62			**Instrumentation & Controls**		
63			Solenoids / Shut-Off Valves	Check with Sales for available config.	
64			Flow Meters	Check with Sales for available config.	
65			Calorimeter	NA	
66			Pressure Switches/Transmitters	Check with Sales for available config.	
67			Thermocouples	Check with Sales for available config.	
68			Temperature Switches/Transmitters	Check with Sales for available config.	
69			BMS	Check with Sales for available config.	
70			CEMS	NA	
71			Other	NA	
72					
73					
74					
75					

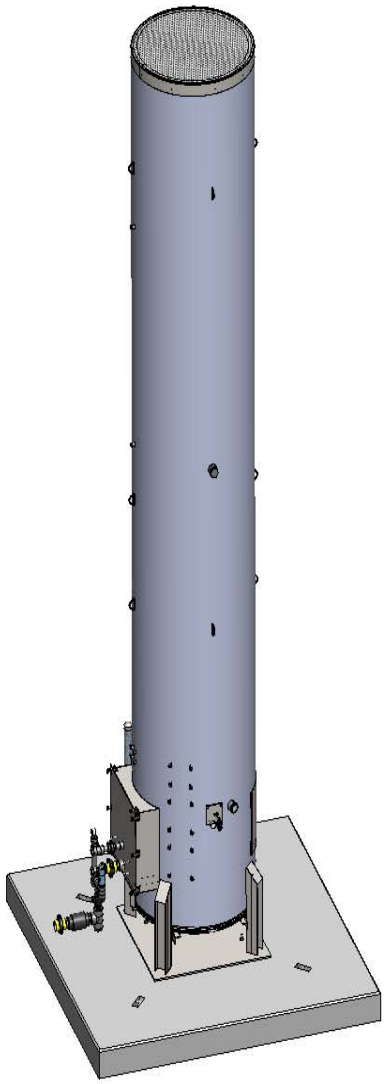
FABRICATION AND INSPECTION

76	**Special requirements**	☐ Skid Mounted ☑ Concrete Pad	**Equipment Info**	
77		☐ Other	**Component**	**Weight / Dimensions**
78			**Burner**	
79	**Inspection**	☑ Vendor Standard	Burner Assembly	
80		☐ Other. Specify:	**Stack**	
81	**Material Certification**	☑ Vendor Standard	Stack Assembly	60 " OD x 30 ' H. 7,000 Lbs
82		☐ MTR	Pilot Tip	
83		☐ Certificate of Compliance	Pilot Line(s)	
84		☐ Other (Specify):	Concrete Pad	12'x12' 12". 21,600 Lbs
85	**NDE**	☑ Vendor Standard	**Auxiliary Equipment**	
86		☐ Radiography. Specify:	Blowers	
87		☐ Ultrasonic. Specify:	Inlet KO / Liquid Seal	
88		☐ Liquid Penetrant.	Flame / Detonation Arrestor	
89		☐ Magnetic Particles.	Skid	
90		☐ PMI. Specify:	**Instrumentation & Controls**	
91		☐ Other. Specify:	BMS	
92	**Surface Preparation**	☑ Vendor Standard	Control Panel	
93		☐ Other. Specify:		
94	**Paint System**	☑ Vendor Standard		
95		☐ Other. Specify:		
96	**Finished Color**	☑ Vendor Standard		
97		☐ Other. Specify:		
98				
99				

Additional Notes:

		Item/Tag No.:		Page	3	of	3
		Project No.:		Revision:	A		
		Project:		Date:	10 November 2014		
				By:	JS		
Environmental Control Equipment		P.O. No.:	-	Checked:	SG		
Data Sheet		RFQ No.:	-	Approved:	MS		
Client:		Ref. P&ID:	-				
Site:				Supplier:	LEED FABRICATION		
Unit/Lease:		Remarks:	-	Model No.:	L30-0028-00		

GENERAL ARRANGEMENT



ATTACHMENT T

Emission Calculations

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.

Company Name: **EQT Production, LLC**
Facility Name: **OXF 160 Wellpad**
Project Description: **G70-D Application**

Facility-Wide Emission Summary - Controlled

Wells	7	per pad
Storage Tanks	6	per pad
Sand Separator Tank	1	per pad
Line Heaters	7	per pad
TEGs	2	per pad
Dehy Reboiler	0	per pad
Glycol Dehy	0	per pad
Dehy Drip Tank	0	per pad
Dehy Combustor	0	per pad
Compressor	0	per pad
High Pressure Separator	7	per pad
Low Pressure Separator	1	per pad
Vapor Recovery Unit	1	per pad
Tank Combustor	2	per pad
Length of lease road	3,943	feet

Carbon equivalent emissions (CO_2e) are based on the following Global Warming Potentials (GWP) from 40 CFR Part 98, Table A-1:

CO_2	1
CH_4	25
N_2O	298

Emission Point ID #	Emission Source ID#s	Emission Source Description	NO_x		CO		VOC		SO_2		PM_{10}		$PM_{2.5}$		CH_4		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
C001-C002	S013-S018	Storage Vessels	---	---	---	---	0.64	2.81	---	---	---	---	---	---	0.42	1.84	10.51	46.03
C001-C002	S012	Captured Liquid Loading	---	---	---	---	1.69	0.44	---	---	---	---	---	---	---	---	---	---
C001	C001	Tank Combustor	1.15	5.03	0.96	4.22	2.8E-04	1.2E-03	0.01	0.03	0.09	0.38	0.09	0.38	0.00	0.00	1,371.10	6,005.43
C002	C002	Tank Combustor	1.89	8.28	1.59	6.95	2.8E-04	1.2E-03	0.01	0.05	0.14	0.63	0.14	0.63	0.00	0.00	2,256.10	9,881.72
C001	**S013-S018, S012, C001**	**---**	**1.15**	**5.03**	**0.96**	**4.22**	**1.16**	**1.63**	**0.01**	**0.03**	**0.09**	**0.38**	**0.09**	**0.38**	**0.21**	**0.92**	**1,376.36**	**6,028.45**
C002	**S013-S018, S012, C002**	**---**	**1.89**	**8.28**	**1.59**	**6.95**	**1.16**	**1.63**	**0.01**	**0.05**	**0.14**	**0.63**	**0.14**	**0.63**	**0.21**	**0.92**	**2,261.35**	**9,904.73**
E005	S005	Line Heater	0.15	0.64	0.12	0.54	0.01	0.04	8.8E-04	3.9E-03	0.01	0.05	0.01	0.05	0.00	0.01	180.18	789.20
E006	S006	Line Heater	0.15	0.64	0.12	0.54	0.01	0.04	8.8E-04	3.9E-03	0.01	0.05	0.01	0.05	0.00	0.01	180.18	789.20
E007	S007	Line Heater	0.15	0.64	0.12	0.54	0.01	0.04	8.8E-04	3.9E-03	0.01	0.05	0.01	0.05	0.00	0.01	180.18	789.20
E008	S008	Line Heater	0.15	0.64	0.12	0.54	0.01	0.04	8.8E-04	3.9E-03	0.01	0.05	0.01	0.05	0.00	0.01	180.18	789.20
E009	S009	Thermoelectric Generator	1.2E-03	0.01	1.0E-03	4.5E-03	6.8E-05	3.0E-04	7.4E-06	3.2E-05	9.4E-05	4.1E-04	9.4E-05	4.1E-04	0.00	0.00	1.52	6.64
E010	S010	Thermoelectric Generator	1.2E-03	0.01	1.0E-03	4.5E-03	6.8E-05	3.0E-04	7.4E-06	3.2E-05	9.4E-05	4.1E-04	9.4E-05	4.1E-04	0.00	0.00	1.52	6.64
E019	S019	Line Heater	0.29	1.28	0.25	1.08	0.02	0.07	1.8E-03	7.7E-03	0.02	0.10	0.02	0.10	0.01	0.03	360.36	1,578.39
E020	S020	Line Heater	0.29	1.28	0.25	1.08	0.02	0.07	1.8E-03	7.7E-03	0.02	0.10	0.02	0.10	0.01	0.03	360.36	1,578.39
E021	S021	Line Heater	0.29	1.28	0.25	1.08	0.02	0.07	1.8E-03	7.7E-03	0.02	0.10	0.02	0.10	0.01	0.03	360.36	1,578.39
E022	S022	Line Heater	0.29	1.28	0.25	1.08	0.02	0.07	1.8E-03	7.7E-03	0.02	0.10	0.02	0.10	0.01	0.03	360.36	1,578.39
E023	S023	Line Heater	0.10	0.42	0.08	0.35	0.01	0.02	5.7E-04	2.5E-03	0.01	0.03	0.01	0.03	0.00	0.01	117.12	512.98
E011	S011	Sand Separator Tank	---	---	---	---	0.06	0.24	---	---	---	---	---	---	0.02	0.09	0.53	2.33
E024	S024	VRU Engine	0.61	2.66	1.21	5.31	0.47	2.04	1.2E-03	0.01	0.04	0.17	0.04	0.17	0.00	0.02	316.12	1,384.59
E012	S012	Uncaptured Liquid Loading	---	---	---	---	36.13	9.39	---	---	---	---	---	---	---	---	---	---
---	---	Fugitives	---	---	---	---	---	20.64	---	---	---	---	---	---	---	12.82	---	357.00
---	---	Haul Roads	---	---	---	---	---	---	---	---	---	4.72	---	0.47	---	---	---	---
Facility Total			5.50	24.09	5.32	23.32	39.09	36.01	0.03	0.13	0.41	6.53	0.41	2.27	0.49	14.96	6,236.69	27,673.70
Facility Total (excluding fugitive emissions)			5.50	24.09	5.32	23.32	39.09	15.37	0.03	0.13	0.41	1.80	0.41	1.80	0.49	2.14	6,236.69	27,316.71

Company Name: EQT Production, LLC
Facility Name: OXF 160 Wellpad
Project Description: G70-D Application

Facility-Wide Emission Summary - Controlled

Emission Point ID #	Emission Source ID#s	Emission Source Description	Formaldehyde		Benzene		Toluene		Ethylbenzene		Xylenes		n-Hexane		Total BTEX		Total HAP	
			lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
C001-C002	S013-S018	Storage Vessels	---	---	9.4E-04	4.1E-03	1.9E-03	8.3E-03	9.2E-05	4.0E-04	1.0E-03	4.5E-03	0.01	0.05	4.0E-03	0.02	0.02	0.08
C001-C002	S012	Captured Liquid Loading	---	---	1.3E-03	3.3E-04	1.5E-03	3.9E-04	6.7E-05	1.7E-05	7.3E-04	1.9E-04	0.03	0.01	3.6E-03	9.3E-04	0.04	0.01
C001	C001	Tank Combustor	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C002	C002	Tank Combustor	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C001	**S013-S018, S012, C001**	**---**	---	---	**1.1E-03**	**2.2E-03**	**1.7E-03**	**4.3E-03**	**8.0E-05**	**2.1E-04**	**8.8E-04**	**2.3E-03**	**0.02**	**0.03**	**3.8E-03**	**0.01**	**0.03**	**0.04**
C002	**S013-S018, S012, C002**	**---**	---	---	**1.1E-03**	**2.2E-03**	**1.7E-03**	**4.3E-03**	**8.0E-05**	**2.1E-04**	**8.8E-04**	**2.3E-03**	**0.02**	**0.03**	**3.8E-03**	**0.01**	**0.03**	**0.04**
E005	S005	Line Heater	1.1E-04	4.8E-04	3.1E-06	1.3E-05	5.0E-06	2.2E-05	---	---	---	---	2.6E-03	0.01	8.1E-06	3.5E-05	2.8E-03	0.01
E006	S006	Line Heater	1.1E-04	4.8E-04	3.1E-06	1.3E-05	5.0E-06	2.2E-05	---	---	---	---	2.6E-03	0.01	8.1E-06	3.5E-05	2.8E-03	0.01
E007	S007	Line Heater	1.1E-04	4.8E-04	3.1E-06	1.3E-05	5.0E-06	2.2E-05	---	---	---	---	2.6E-03	0.01	8.1E-06	3.5E-05	2.8E-03	0.01
E008	S008	Line Heater	1.1E-04	4.8E-04	3.1E-06	1.3E-05	5.0E-06	2.2E-05	---	---	---	---	2.6E-03	0.01	8.1E-06	3.5E-05	2.8E-03	0.01
E009	S009	Thermoelectric Generator	9.3E-07	4.1E-06	2.6E-08	1.1E-07	4.2E-08	1.8E-07	---	---	---	---	2.2E-05	9.7E-05	6.8E-08	3.0E-07	2.3E-05	1.0E-04
E010	S010	Thermoelectric Generator	9.3E-07	4.1E-06	2.6E-08	1.1E-07	4.2E-08	1.8E-07	---	---	---	---	2.2E-05	9.7E-05	6.8E-08	3.0E-07	2.3E-05	1.0E-04
E019	S019	Line Heater	2.2E-04	9.6E-04	6.2E-06	2.7E-05	1.0E-05	4.4E-05	---	---	---	---	5.3E-03	0.02	1.6E-05	7.1E-05	5.5E-03	0.02
E020	S020	Line Heater	2.2E-04	9.6E-04	6.2E-06	2.7E-05	1.0E-05	4.4E-05	---	---	---	---	5.3E-03	0.02	1.6E-05	7.1E-05	5.5E-03	0.02
E021	S021	Line Heater	2.2E-04	9.6E-04	6.2E-06	2.7E-05	1.0E-05	4.4E-05	---	---	---	---	5.3E-03	0.02	1.6E-05	7.1E-05	5.5E-03	0.02
E022	S022	Line Heater	2.2E-04	9.6E-04	6.2E-06	2.7E-05	1.0E-05	4.4E-05	---	---	---	---	5.3E-03	0.02	1.6E-05	7.1E-05	5.5E-03	0.02
E023	S023	Line Heater	7.1E-05	3.1E-04	2.0E-06	8.8E-06	3.2E-06	1.4E-05	---	---	---	---	1.7E-03	0.01	5.2E-06	2.3E-05	1.8E-03	0.01
E011	S011	Sand Separator Tank	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.0E-03	<0.01	<0.01	<0.01	1.0E-03	3.0E-03
E024	S024	VRU Engine	0.04	0.18	3.2E-03	1.4E-02	1.1E-03	5.0E-03	5.1E-05	2.2E-04	4.0E-04	1.7E-03	---	---	4.8E-03	0.02	6.6E-02	2.9E-01
E012	S012	Uncaptured Liquid Loading	---	---	0.03	0.01	0.03	0.01	1.4E-03	3.7E-04	1.6E-02	4.1E-03	0.66	0.17	0.08	0.02	0.83	0.22
---	---	Fugitives	---	---	---	0.01	---	0.02	---	<0.01	---	0.01	---	0.35	---	0.04	<0.01	0.64
---	---	Haul Roads	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Facility Total			0.04	0.19	0.03	0.03	0.04	0.04	1.7E-03	1.0E-03	0.02	0.02	0.74	0.73	0.09	0.10	0.99	1.39
Facility Total (excluding fugitive emissions)			0.04	0.19	3.2E-02	0.03	3.7E-02	2.2E-02	1.7E-03	1.0E-03	1.8E-02	1.1E-02	0.74	0.38	0.09	0.06	0.99	0.75

Company Name: EQT Production, LLC
Facility Name: OXF 160 Wellpad
Project Description: G70-D Application

Produced Fluids Storage Vessels

Potential Throughput

Operational Hours	8,760	hrs/yr
Maximum Condensate Throughput[1]	4,997	bbl/month
Maximum Produced Water Throughput[1]	40,434	bbl/month

[1] Based on the current liquid permit limits (13,084,000 gal) scaled up to new total number of wells at the pad (7 wells).

Overall Control Efficiency of Combustor 95%

Storage Tanks - Uncontrolled

	Breathing		Working		Flashing		Total Emissions	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Methane	<0.001	<0.001	<0.001	<0.001	8.408	36.827	8.408	36.827
Ethane	<0.001	<0.001	<0.001	<0.001	6.739	29.519	6.739	29.519
Propane	0.065	0.284	0.880	3.856	5.222	22.873	6.167	27.013
Isobutane	0.013	0.056	0.165	0.722	1.049	4.597	1.227	5.375
n-Butane	0.027	0.119	0.352	1.540	2.317	10.149	2.696	11.809
Isopentane	0.008	0.037	0.108	0.471	0.704	3.085	0.820	3.593
n-Pentane	0.008	0.033	0.097	0.426	0.656	2.872	0.760	3.331
n-Hexane	0.002	0.011	0.031	0.137	0.208	0.911	0.242	1.059
Cyclohexane	1.4E-04	0.001	0.002	0.008	0.019	0.081	0.020	0.090
Methylcyclopentane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
n-Heptane	0.003	0.012	0.035	0.153	0.243	1.062	0.280	1.227
n-Octane	0.001	0.003	0.010	0.043	0.070	0.305	0.080	0.352
n-Nonane	1.9E-04	0.001	0.002	0.011	0.018	0.079	0.021	0.090
n-Decane	1.8E-04	0.001	0.002	0.010	0.017	0.073	0.019	0.084
n-Undecane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dodecane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Triethylene Glycol	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cyclopentane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Isohexane	0.004	0.017	0.050	0.221	0.329	1.441	0.383	1.679
3-Methylpentane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Neohexane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
2,3-Dimethylbutane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylcyclohexane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Decane, 2-Methyl-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Benzene	4.8E-05	2.1E-04	0.002	0.008	0.017	0.075	0.019	0.083
Toluene	9.5E-05	4.1E-04	0.002	0.008	0.036	0.157	0.038	0.165
Ethylbenzene	5.0E-06	2.2E-05	7.2E-05	3.1E-04	0.002	0.008	0.002	0.008
m-Xylene	5.6E-05	2.4E-04	0.001	0.003	0.020	0.087	0.021	0.090
Isooctane	3.4E-04	0.001	0.004	0.019	0.030	0.131	0.035	0.152
Total VOC Emissions:	0.13	0.58	1.74	7.64	10.96	47.99	12.83	56.20
Total HAP Emissions:	3.0E-03	0.01	0.04	0.18	0.31	1.37	0.36	1.56

[1] Uncontrolled emissions calculation using Promax (sum of produced water and condensate). Non-methane emissions are taken from the tank emissions stencil. Methane emissions are taken from the flash stream composition.
[2] Composition of condensate from OXF-160 sample from 7/16/2013.

Company Name: EQT Production, LLC
Facility Name: OXF 160 Wellpad
Project Description: G70-D Application

Produced Fluids Storage Vessels

Storage Tanks - Controlled

	Breathing		Working		Flashing		Total Emissions	
	lb/hr	tpy			lb/hr	tpy	lb/hr	tpy
Methane	<0.001	<0.001	<0.001	<0.001	0.420	1.841	0.420	1.841
Ethane	<0.001	<0.001	<0.001	<0.001	0.337	1.476	0.337	1.476
Propane	0.003	0.014	0.044	0.193	0.261	1.144	0.308	1.351
Isobutane	0.001	0.003	0.008	0.036	0.052	0.230	0.061	0.269
n-Butane	0.001	0.006	0.018	0.077	0.116	0.507	0.135	0.590
Isopentane	4.2E-04	0.002	0.005	0.024	0.035	0.154	0.041	0.180
n-Pentane	3.8E-04	0.002	0.005	0.021	0.033	0.144	0.038	0.167
n-Hexane	1.2E-04	0.001	0.002	0.007	0.010	0.046	0.012	0.053
Cyclohexane	6.8E-06	3.0E-05	8.7E-05	3.8E-04	0.001	0.004	0.001	0.004
Methylcyclopentane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
n-Heptane	1.4E-04	0.001	0.002	0.008	0.012	0.053	0.014	0.061
n-Octane	3.9E-05	1.7E-04	4.9E-04	0.002	0.003	0.015	0.004	0.018
n-Nonane	9.7E-06	4.3E-05	1.2E-04	0.001	0.001	0.004	0.001	0.005
n-Decane	8.8E-06	3.8E-05	1.1E-04	4.9E-04	0.001	0.004	0.001	0.004
n-Undecane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dodecane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Triethylene Glycol	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cyclopentane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Isohexane	2.0E-04	0.001	0.003	0.011	0.016	0.072	0.019	0.084
3-Methylpentane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Neohexane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
2,3-Dimethylbutane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylcyclohexane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Decane, 2-Methyl-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Benzene	2.4E-06	1.0E-05	9.0E-05	4.0E-04	0.001	0.004	0.001	0.004
Toluene	4.7E-06	2.1E-05	9.0E-05	3.9E-04	0.002	0.008	0.002	0.008
Ethylbenzene	2.5E-07	1.1E-06	3.6E-06	1.6E-05	8.9E-05	3.9E-04	9.2E-05	4.0E-04
m-Xylene	2.8E-06	1.2E-05	3.8E-05	1.7E-04	0.001	0.004	0.001	0.005
Isooctane	1.7E-05	7.5E-05	2.2E-04	0.001	0.001	0.007	0.002	0.008
Total VOC Emissions:	6.6E-03	0.03	0.09	0.38	0.55	2.40	0.64	2.81
Total HAP Emissions:	1.5E-04	6.6E-04	2.0E-03	8.8E-03	1.6E-02	0.07	0.02	0.08

Company Name: EQT Production, LLC
Facility Name: OXF 160 Wellpad
Project Description: G70-D Application

Sand Separator Tank

Throughput Parameter	Value	Units
Tank Capacity	4,200	gallons
Operational Hours	8,760	hrs/yr
Throughput	200	bbl/month
Percent Produced Water	50%	
Total Produced Water Throughput	100	bbl/month

[1] Conservatively assumes 2 turnovers/month of sand and produced water.

Description	Potential Throughput (gal/yr)
Produced Water and Sand	100,800

Sand Separator Tank (140 bbl) - Uncontrolled *(Per tank)* [2, 3]

Constituent	Total Emissions [1] lb/hr	tpy
Methane	0.021	0.093
Ethane	0.030	0.131
Propane	0.027	0.119
Isobutane	0.005	0.024
n-Butane	0.012	0.052
Isopentane	0.004	0.016
n-Pentane	0.003	0.014
Hexanes	0.001	0.004
Heptanes	0.001	0.005
Octane	<0.001	0.001
Nonane	<0.001	<0.001
Decane	<0.001	<0.001
Benzene	<0.001	<0.001
Toluene	<0.001	<0.001
Ethylbenzene	<0.001	<0.001
Xylenes	<0.001	<0.001
n-Hexane	0.001	0.003
2,2,4-Trimethylpentane	<0.001	<0.001
Total HC Emissions:	0.106	0.463
Total VOC Emissions:	0.055	0.240
Total HAP Emissions:	0.001	0.003

[2] E&P TANK 2.0 calculates working, breathing and flashing losses and reports the sum as one total.
[3] E&P TANK v2.0 emission calculations are based on OXF-160 condensate sample from 7/16/2013.

Company Name: EQT Production, LLC
Facility Name: OXF 160 Wellpad
Project Description: G70-D Application

Sand Separator Tank

Sand Separator Tank (140 bbl) - Controlled *(Per tank)*

Constituent	Total Emissions lb/hr	tpy
Methane	0.021	0.093
Ethane	0.030	0.131
Propane	0.027	0.119
Isobutane	0.005	0.024
n-Butane	0.012	0.052
Isopentane	0.004	0.016
n-Pentane	0.003	0.014
Hexanes	0.001	0.004
Heptanes	0.001	0.005
Octane	<0.001	0.001
Nonane	<0.001	<0.001
Decane	<0.001	<0.001
Benzene	<0.001	<0.001
Toluene	<0.001	<0.001
Ethylbenzene	<0.001	<0.001
Xylenes	<0.001	<0.001
n-Hexane	0.001	0.003
2,2,4-Trimethylpentane	<0.001	<0.001
Total Emissions:	0.106	0.464
Total VOC Emissions:	0.055	0.240
Total HAP Emissions:	0.001	0.003

Company Name: EQT Production, LLC
Facility Name: OXF 160 Wellpad
Project Description: G70-D Application

VRU Engine

Engine Information:

Manufacturer:	Caterpilllar
Model No.:	G3406
Engine ID	S024
Stroke Cycle:	4-stroke
Type of Burn:	Rich
Rated Horsepower (bhp):	275

Engine Fuel Information:

Fuel Type:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,050
Specific Fuel Consumption (Btu/bhp-hr):	7,418
Maximum Fuel Consumption at 100% Load (scf/hr):	1,943
Heat Input (MMBtu/hr):	2.04
Potential Fuel Consumption (MMBtu/yr):	17,870
Max. Fuel Consumption at 100%(MMscf/hr):	0.0019
Max. Fuel Consumption (MMscf/yr):	17.0
Max. Annual Hours of Operation (hr/yr):	8,760

Engine Emissions Data:

Pollutant	Emission Factor	Units	Maximum Potential Emissions		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
NO_X	1.00	g/bhp-hr	0.61	2.66	40 CFR 60, Subpart JJJJ, Table 1
VOC (excludes HCHO)	0.70	g/bhp-hr	0.42	1.86	40 CFR 60, Subpart JJJJ, Table 1
VOC (includes HCHO)	---	---	0.47	2.04	VOC + HCHO
CO	2.00	g/bhp-hr	1.21	5.31	40 CFR 60, Subpart JJJJ, Table 1
SO_X	0.001	lb/MMBtu	<0.01	<0.01	AP-42, Table 3.2-3 (Aug-2000)
PM_{10}	0.02	lb/MMBtu	0.04	0.17	AP-42, Table 3.2-3 (Aug-2000)
$PM_{2.5}$	0.02	lb/MMBtu	0.04	0.17	AP-42, Table 3.2-3 (Aug-2000)
Formaldehyde (HCHO)	0.02	lb/MMBtu	0.04	0.18	AP-42, Table 3.2-3 (Aug-2000)
GHG (CO_2e)	See Table Below		316	1,385	40 CFR 98, Tables C-1 & C-2
Other (Total HAP)	See Table Below		0.07	0.29	AP-42, Table 3.2-3 (Aug-2000)

Notes:

1. PM_{10} and $PM_{2.5}$ are total values (filterable + condensable).
2. GHG (CO_2e) is carbon dioxide equivalent, which is the summation of CO_2 (GWP = 1) + CH_4 (GWP = 25) + N_2O (GWP = 298).
3. Total HAP is the summation of all hazardous air pollutants for which there is a published emission factor for this source type.

Company Name: EQT Production, LLC
Facility Name: OXF 160 Wellpad
Project Description: G70-D Application

VRU Engine

Greenhouse Gas (GHG) & Hazardous Air Pollutant (HAP) Emissions Calculations:

Pollutant	Emission Factor	Units	Maximum Potential Emissions		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
GHGs:					
CO_2	521.00	g/bhp-hr	315.87	1383.51	Manufac Spec
CH_4	0.001	kg/MMBtu	4.5E-03	2.0E-02	40 CFR 98, Table C-2
N_2O	0.0001	kg/MMBtu	4.5E-04	2.0E-03	40 CFR 98, Table C-2
GHG (CO_2e)			**316**	**1,385**	
Organic HAPs:					
1,1,2,2-Tetrachloroethane	2.53E-05	lb/MMBtu	5.2E-05	2.3E-04	AP-42, Table 3.2-3 (Aug-2000)
1,1,2-Trichloroethane	1.53E-05	lb/MMBtu	3.1E-05	1.4E-04	AP-42, Table 3.2-3 (Aug-2000)
1,3-Butadiene	6.63E-04	lb/MMBtu	1.4E-03	5.9E-03	AP-42, Table 3.2-3 (Aug-2000)
1,3-Dichloropropene	1.27E-05	lb/MMBtu	2.6E-05	1.1E-04	AP-42, Table 3.2-3 (Aug-2000)
Acetaldehyde	2.79E-03	lb/MMBtu	5.7E-03	2.5E-02	AP-42, Table 3.2-3 (Aug-2000)
Acrolein	2.63E-03	lb/MMBtu	5.4E-03	2.3E-02	AP-42, Table 3.2-3 (Aug-2000)
Benzene	1.58E-03	lb/MMBtu	3.2E-03	1.4E-02	AP-42, Table 3.2-3 (Aug-2000)
Carbon Tetrachloride	1.77E-05	lb/MMBtu	3.6E-05	1.6E-04	AP-42, Table 3.2-3 (Aug-2000)
Chlorobenzene	1.29E-05	lb/MMBtu	2.6E-05	1.2E-04	AP-42, Table 3.2-3 (Aug-2000)
Chloroform	1.37E-05	lb/MMBtu	2.8E-05	1.2E-04	AP-42, Table 3.2-3 (Aug-2000)
Ethylbenzene	2.48E-05	lb/MMBtu	5.1E-05	2.2E-04	AP-42, Table 3.2-3 (Aug-2000)
Ethylene Dibromide	2.13E-05	lb/MMBtu	4.3E-05	1.9E-04	AP-42, Table 3.2-3 (Aug-2000)
Methanol	3.06E-03	lb/MMBtu	6.2E-03	2.7E-02	AP-42, Table 3.2-3 (Aug-2000)
Methylene Chloride	4.12E-05	lb/MMBtu	8.4E-05	3.7E-04	AP-42, Table 3.2-3 (Aug-2000)
Naphthalene	9.71E-05	lb/MMBtu	2.0E-04	8.7E-04	AP-42, Table 3.2-3 (Aug-2000)
PAH	1.41E-04	lb/MMBtu	2.9E-04	1.3E-03	AP-42, Table 3.2-3 (Aug-2000)
Styrene	1.19E-05	lb/MMBtu	2.4E-05	1.1E-04	AP-42, Table 3.2-3 (Aug-2000)
Toluene	5.58E-04	lb/MMBtu	1.1E-03	5.0E-03	AP-42, Table 3.2-3 (Aug-2000)
Vinyl Chloride	7.18E-06	lb/MMBtu	1.5E-05	6.4E-05	AP-42, Table 3.2-3 (Aug-2000)
Xylene	1.95E-04	lb/MMBtu	4.0E-04	1.7E-03	AP-42, Table 3.2-3 (Aug-2000)
Total HAP			**0.07**	**0.29**	

Company Name: EQT Production, LLC
Facility Name: OXF 160 Wellpad
Project Description: G70-D Application

Tank Combustor

Source Designation:	**C001**
Pilot Fuel Used:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,050
Pilot Rating (MMBtu/hr)	0.05
Combustor Rating (MMBtu/hr) [1]	11.66
Combustor Rating (Mscfd) [1]	188.38
Combustor Rating (scf/hr)	7849.17
Pilot Fuel Consumption (scf/hr):	50.00
Potential Annual Hours of Operation (hr/yr):	8,760

[1] Maximum heat input for 48" model from Leed Enclosed Combustor Operations Manual

Enclosed Combustor Emissions

Pollutant	Emission Factors [2] (lb/MMBtu)	Combustor (lb/hr)	Combustor (tpy)	Pilot (lb/hr)	Pilot (tpy)	Total (lb/hr)	Total (tpy)
NO_x	0.10	1.14	5.01	5.1E-03	0.02	1.15	5.03
CO	0.08	0.96	4.21	4.3E-03	0.02	0.96	4.22
VOC	5.4E-03	---	---	2.8E-04	1.2E-03	0.00	0.00
SO_2	5.9E-04	0.01	0.03	3.1E-05	1.4E-04	0.01	0.03
PM/PM_{10}	0.01	0.09	0.38	3.9E-04	1.7E-03	0.09	0.38
CO_2	117.00	1364.189	5975.146	6.14	26.90	1370.33	6002.05
CH_4	2.2E-03	---	---	1.2E-04	5.1E-04	0.00	0.00
N_2O	2.2E-04	2.6E-03	0.01	1.2E-05	5.1E-05	2.6E-03	0.01

[2] Emission factors from AP-42 Ch. 1.4 for natural gas combustion were used as they were determined to be most representative of the process. Ch. 5.3 (Natural Gas Processing) was consulted, however, factors contained there are appropriate for amine gas sweetening processes, which is not the case at the wellpad. Also, Ch. 13.5 (Industrial Flares) was consulted, but since the control device in this case is an enclosed combustor vs. an elevated flare, these factors were also determined to be inappropriate.

Combustor Maximum Loading:

$$\frac{7849.17\ \text{scf}}{\text{hr}} \left| \frac{\text{lb-mol}}{379.5\ \text{scf}} \right| \frac{20.43\ \text{lb}}{\text{lb-mol}} = 422.65\ \text{lb/hr}$$

Company Name: EQT Production, LLC
Facility Name: OXF 160 Wellpad
Project Description: G70-D Application

Tank Combustor

Source Designation:	**C002**
Pilot Fuel Used:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,050
Pilot Rating (MMBtu/hr)	0.05
Combustor Rating (MMBtu/hr) [1]	19.22
Combustor Rating (Mscfd) [1]	188.38
Combustor Rating (scf/hr)	7849.17
Pilot Fuel Consumption (scf/hr):	50.00
Potential Annual Hours of Operation (hr/yr):	8,760

[1] Maximum heat input for 60" model from Leed Enclosed Combustor Operations Manual

Enclosed Combustor Emissions

Pollutant	Emission Factors [2] (lb/MMBtu)	Combustor (lb/hr)	Combustor (tpy)	Pilot (lb/hr)	Pilot (tpy)	Total (lb/hr)	Total (tpy)
NO_x	0.10	1.88	8.25	5.1E-03	0.02	1.89	8.28
CO	0.08	1.58	6.93	4.3E-03	0.02	1.59	6.95
VOC	5.4E-03	---	---	2.8E-04	1.2E-03	0.00	0.00
SO_2	5.9E-04	0.01	0.05	3.1E-05	1.4E-04	0.01	0.05
PM/PM_{10}	0.01	0.14	0.63	3.9E-04	1.7E-03	0.14	0.63
CO_2	117.00	2248.688	9849.254	6.14	26.90	2254.83	9876.16
CH_4	2.2E-03	---	---	1.2E-04	5.1E-04	0.00	0.00
N_2O	2.2E-04	4.2E-03	0.02	1.2E-05	5.1E-05	4.2E-03	0.02

[2] Emission factors from AP-42 Ch. 1.4 for natural gas combustion were used as they were determined to be most representative of the process. Ch. 5.3 (Natural Gas Processing) was consulted, however, factors contained there are appropriate for amine gas sweetening processes, which is not the case at the wellpad. Also, Ch. 13.5 (Industrial Flares) was consulted, but since the control device in this case is an enclosed combustor vs. an elevated flare, these factors were also determined to be inappropriate.

Combustor Maximum Loading:

$$\frac{7849.17\ \text{scf}}{\text{hr}} \left| \frac{\text{lb-mol}}{379.5\ \text{scf}} \right| \frac{20.43\ \text{lb}}{\text{lb-mol}} = 422.65\ \text{lb/hr}$$

Company Name: EQT Production, LLC
Facility Name: OXF 160 Wellpad
Project Description: G70-D Application

Thermoelectric Generators

Source Designation:	**S009-S010**
Fuel Used:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,050
Heat Input (MMBtu/hr) [1]	0.013
Fuel Consumption (MMscf/hr):	1.23E-05
Potential Annual Hours of Operation (hr/yr):	8,760

[1] Global Themorelectric specification sheet states 311 ft^3/day at 1000 BTU/ft^3.

Criteria and Manufacturer Specific Pollutant Emission Rates:

Pollutant	Emission Factor (lb/MMscf)[2, 5]	Potential Emissions (lb/hr)[3]	Potential Emissions (tons/yr)[4]
NO_x	100	1.2E-03	0.01
CO	84	1.0E-03	4.5E-03
VOC	5.5	6.8E-05	3.0E-04
SO_2	0.6	7.4E-06	3.2E-05
PM Total	7.6	9.4E-05	4.1E-04
PM Condensable	5.7	7.0E-05	3.1E-04
PM_{10} (Filterable)	1.9	2.3E-05	1.0E-04
$PM_{2.5}$ (Filterable)	1.9	2.3E-05	1.0E-04
Lead	5.00E-04	6.2E-09	2.7E-08
CO_2	116.9	1.51	6.64
CH_4	2.21E-03	2.9E-05	1.3E-04
N_2O	2.21E-04	2.9E-06	1.3E-05

Company Name: EQT Production, LLC
Facility Name: OXF 160 Wellpad
Project Description: G70-D Application

Thermoelectric Generators

Hazardous Air Pollutant (HAP) Potential Emissions:

Pollutant	Emission Factor (lb/MMscf)[2]	Potential Emissions (lb/hr)[3]	Potential Emissions (tons/yr)[4]
HAPs:			
2-Methylnaphthalene	2.4E-05	3.0E-10	1.3E-09
3-Methylchloranthrene	1.8E-06	2.2E-11	9.7E-11
7,12-Dimethylbenz(a)anthracene	1.6E-05	2.0E-10	8.6E-10
Acenaphthene	1.8E-06	2.2E-11	9.7E-11
Acenaphthylene	1.8E-06	2.2E-11	9.7E-11
Anthracene	2.4E-06	3.0E-11	1.3E-10
Benz(a)anthracene	1.8E-06	2.2E-11	9.7E-11
Benzene	2.1E-03	2.6E-08	1.1E-07
Benzo(a)pyrene	1.2E-06	1.5E-11	6.5E-11
Benzo(b)fluoranthene	1.8E-06	2.2E-11	9.7E-11
Benzo(g,h,i)perylene	1.2E-06	1.5E-11	6.5E-11
Benzo(k)fluoranthene	1.8E-06	2.2E-11	9.7E-11
Chrysene	1.8E-06	2.2E-11	9.7E-11
Dibenzo(a,h) anthracene	1.2E-06	1.5E-11	6.5E-11
Dichlorobenzene	1.2E-03	1.5E-08	6.5E-08
Fluoranthene	3.0E-06	3.7E-11	1.6E-10
Fluorene	2.8E-06	3.5E-11	1.5E-10
Formaldehyde	7.5E-02	9.3E-07	4.1E-06
Hexane	1.8E+00	2.2E-05	9.7E-05
Indo(1,2,3-cd)pyrene	1.8E-06	2.2E-11	9.7E-11
Naphthalene	6.1E-04	7.5E-09	3.3E-08
Phenanthrene	1.7E-05	2.1E-10	9.2E-10
Pyrene	5.0E-06	6.2E-11	2.7E-10
Toluene	3.4E-03	4.2E-08	1.8E-07
Arsenic	2.0E-04	2.5E-09	1.1E-08
Beryllium	1.2E-05	1.5E-10	6.5E-10
Cadmium	1.1E-03	1.4E-08	5.9E-08
Chromium	1.4E-03	1.7E-08	7.6E-08
Cobalt	8.4E-05	1.0E-09	4.5E-09
Manganese	3.8E-04	4.7E-09	2.1E-08
Mercury	2.6E-04	3.2E-09	1.4E-08
Nickel	2.1E-03	2.6E-08	1.1E-07
Selenium	2.4E-05	3.0E-10	1.3E-09
Total HAP		**2.3E-05**	**1.0E-04**

[2] Emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, & 1.4-3

[3] Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf).

[4] Annual Emissions $(tons/yr)_{Potential}$ = $(lb/hr)_{Emissions}$ × (Maximum Allowable Operating Hours, 8760 hr/yr) × (1 ton/2000 lb).

[5] GHG Emission factors from Tables C-1 and C-2, 40 CFR 98, Subpart C.

Company Name: EQT Production, LLC
Facility Name: OXF 160 Wellpad
Project Description: G70-D Application

Line Heaters

Source Designation:	**S005-S008**
Fuel Used:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,050
Heat Input (MMBtu/hr)	1.54
Fuel Consumption (MMscf/hr):	1.47E-03
Potential Annual Hours of Operation (hr/yr):	8,760

Criteria and Manufacturer Specific Pollutant Emission Rates:

Pollutant	Emission Factor (lb/MMscf)[1, 4]	Potential Emissions	
		(lb/hr)[2]	(tons/yr)[3]
NO_x	100	0.15	0.64
CO	84	0.12	0.54
VOC	5.5	0.01	0.04
SO_2	0.6	8.8E-04	3.9E-03
PM Total	7.6	0.01	0.05
PM Condensable	5.7	0.01	0.04
PM_{10} (Filterable)	1.9	2.8E-03	0.01
$PM_{2.5}$ (Filterable)	1.9	2.8E-03	0.01
Lead	5.00E-04	7.3E-07	3.2E-06
CO_2	117.0	180.00	788.38
CH_4	2.21E-03	3.4E-03	1.5E-02
N_2O	2.21E-04	3.4E-04	1.5E-03

Company Name: EQT Production, LLC
Facility Name: OXF 160 Wellpad
Project Description: G70-D Application

Line Heaters

Hazardous Air Pollutant (HAP) Potential Emissions:

Pollutant	Emission Factor (lb/MMscf)[1]	Potential Emissions (lb/hr)[2]	Potential Emissions (tons/yr)[3]
HAPs:			
2-Methylnaphthalene	2.4E-05	3.5E-08	1.5E-07
3-Methylchloranthrene	1.8E-06	2.6E-09	1.2E-08
7,12-Dimethylbenz(a)anthracene	1.6E-05	2.3E-08	1.0E-07
Acenaphthene	1.8E-06	2.6E-09	1.2E-08
Acenaphthylene	1.8E-06	2.6E-09	1.2E-08
Anthracene	2.4E-06	3.5E-09	1.5E-08
Benz(a)anthracene	1.8E-06	2.6E-09	1.2E-08
Benzene	2.1E-03	3.1E-06	1.3E-05
Benzo(a)pyrene	1.2E-06	1.8E-09	7.7E-09
Benzo(b)fluoranthene	1.8E-06	2.6E-09	1.2E-08
Benzo(g,h,i)perylene	1.2E-06	1.8E-09	7.7E-09
Benzo(k)fluoranthene	1.8E-06	2.6E-09	1.2E-08
Chrysene	1.8E-06	2.6E-09	1.2E-08
Dibenzo(a,h) anthracene	1.2E-06	1.8E-09	7.7E-09
Dichlorobenzene	1.2E-03	1.8E-06	7.7E-06
Fluoranthene	3.0E-06	4.4E-09	1.9E-08
Fluorene	2.8E-06	4.1E-09	1.8E-08
Formaldehyde	7.5E-02	1.1E-04	4.8E-04
Hexane	1.8E+00	2.6E-03	1.2E-02
Indo(1,2,3-cd)pyrene	1.8E-06	2.6E-09	1.2E-08
Naphthalene	6.1E-04	8.9E-07	3.9E-06
Phenanthrene	1.7E-05	2.5E-08	1.1E-07
Pyrene	5.0E-06	7.3E-09	3.2E-08
Toluene	3.4E-03	5.0E-06	2.2E-05
Arsenic	2.0E-04	2.9E-07	1.3E-06
Beryllium	1.2E-05	1.8E-08	7.7E-08
Cadmium	1.1E-03	1.6E-06	7.1E-06
Chromium	1.4E-03	2.1E-06	9.0E-06
Cobalt	8.4E-05	1.2E-07	5.4E-07
Manganese	3.8E-04	5.6E-07	2.4E-06
Mercury	2.6E-04	3.8E-07	1.7E-06
Nickel	2.1E-03	3.1E-06	1.3E-05
Selenium	2.4E-05	3.5E-08	1.5E-07
Total HAP		**2.8E-03**	**1.2E-02**

[1] Emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, & 1.4-3
[2] Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf).
[3] Annual Emissions $(tons/yr)_{Potential}$ = $(lb/hr)_{Emissions}$ × (Maximum Allowable Operating Hours, 8760 hr/yr) × (1 ton/2000 lb).
[4] GHG Emission factors from Tables C-1 and C-2, 40 CFR 98, Subpart C.

Company Name: EQT Production, LLC
Facility Name: OXF 160 Wellpad
Project Description: G70-D Application

Line Heaters

Source Designation:	**S019-S022**
Fuel Used:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,050
Heat Input (MMBtu/hr)	3.08
Fuel Consumption (MMscf/hr):	2.93E-03
Potential Annual Hours of Operation (hr/yr):	8,760

Criteria and Manufacturer Specific Pollutant Emission Rates:

Pollutant	Emission Factor (lb/MMscf)[1, 4]	Potential Emissions (lb/hr)[2]	Potential Emissions (tons/yr)[3]
NO_x	100	0.29	1.28
CO	84	0.25	1.08
VOC	5.5	0.02	0.07
SO_2	0.6	1.8E-03	7.7E-03
PM Total	7.6	0.02	0.10
PM Condensable	5.7	0.02	0.07
PM_{10} (Filterable)	1.9	0.01	0.02
$PM_{2.5}$ (Filterable)	1.9	0.01	0.02
Lead	5.00E-04	1.5E-06	6.4E-06
CO_2	117.0	359.99	1576.76
CH_4	2.21E-03	6.8E-03	3.0E-02
N_2O	2.21E-04	6.8E-04	3.0E-03

Company Name: EQT Production, LLC
Facility Name: OXF 160 Wellpad
Project Description: G70-D Application

Line Heaters

Hazardous Air Pollutant (HAP) Potential Emissions:

Pollutant	Emission Factor (lb/MMscf)[1]	Potential Emissions (lb/hr)[2]	Potential Emissions (tons/yr)[3]
HAPs:			
2-Methylnaphthalene	2.4E-05	7.0E-08	3.1E-07
3-Methylchloranthrene	1.8E-06	5.3E-09	2.3E-08
7,12-Dimethylbenz(a)anthracene	1.6E-05	4.7E-08	2.1E-07
Acenaphthene	1.8E-06	5.3E-09	2.3E-08
Acenaphthylene	1.8E-06	5.3E-09	2.3E-08
Anthracene	2.4E-06	7.0E-09	3.1E-08
Benz(a)anthracene	1.8E-06	5.3E-09	2.3E-08
Benzene	2.1E-03	6.2E-06	2.7E-05
Benzo(a)pyrene	1.2E-06	3.5E-09	1.5E-08
Benzo(b)fluoranthene	1.8E-06	5.3E-09	2.3E-08
Benzo(g,h,i)perylene	1.2E-06	3.5E-09	1.5E-08
Benzo(k)fluoranthene	1.8E-06	5.3E-09	2.3E-08
Chrysene	1.8E-06	5.3E-09	2.3E-08
Dibenzo(a,h) anthracene	1.2E-06	3.5E-09	1.5E-08
Dichlorobenzene	1.2E-03	3.5E-06	1.5E-05
Fluoranthene	3.0E-06	8.8E-09	3.9E-08
Fluorene	2.8E-06	8.2E-09	3.6E-08
Formaldehyde	7.5E-02	2.2E-04	9.6E-04
Hexane	1.8E+00	5.3E-03	2.3E-02
Indo(1,2,3-cd)pyrene	1.8E-06	5.3E-09	2.3E-08
Naphthalene	6.1E-04	1.8E-06	7.8E-06
Phenanthrene	1.7E-05	5.0E-08	2.2E-07
Pyrene	5.0E-06	1.5E-08	6.4E-08
Toluene	3.4E-03	1.0E-05	4.4E-05
Arsenic	2.0E-04	5.9E-07	2.6E-06
Beryllium	1.2E-05	3.5E-08	1.5E-07
Cadmium	1.1E-03	3.2E-06	1.4E-05
Chromium	1.4E-03	4.1E-06	1.8E-05
Cobalt	8.4E-05	2.5E-07	1.1E-06
Manganese	3.8E-04	1.1E-06	4.9E-06
Mercury	2.6E-04	7.6E-07	3.3E-06
Nickel	2.1E-03	6.2E-06	2.7E-05
Selenium	2.4E-05	7.0E-08	3.1E-07
Total HAP		**5.5E-03**	**2.4E-02**

[1] Emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, & 1.4-3
[2] Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf).
[3] Annual Emissions $(tons/yr)_{Potential}$ = $(lb/hr)_{Emissions}$ × (Maximum Allowable Operating Hours, 8760 hr/yr) × (1 ton/2000 lb).
[4] GHG Emission factors from Tables C-1 and C-2, 40 CFR 98, Subpart C.

Company Name:	**EQT Production, LLC**
Facility Name:	**OXF 160 Wellpad**
Project Description:	**G70-D Application**

Line Heaters

Source Designation:	**S023**
Fuel Used:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,050
Heat Input (MMBtu/hr)	1.00
Fuel Consumption (MMscf/hr):	9.52E-04
Potential Annual Hours of Operation (hr/yr):	8,760

Criteria and Manufacturer Specific Pollutant Emission Rates:

Pollutant	Emission Factor (lb/MMscf)[1, 4]	Potential Emissions	
		(lb/hr)[2]	(tons/yr)[3]
NO_x	100	0.10	0.42
CO	84	0.08	0.35
VOC	5.5	0.01	0.02
SO_2	0.6	5.7E-04	2.5E-03
PM Total	7.6	0.01	0.03
PM Condensable	5.7	0.01	0.02
PM_{10} (Filterable)	1.9	1.8E-03	0.01
$PM_{2.5}$ (Filterable)	1.9	1.8E-03	0.01
Lead	5.00E-04	4.8E-07	2.1E-06
CO_2	117.0	117.00	512.45
CH_4	2.21E-03	2.2E-03	9.7E-03
N_2O	2.21E-04	2.2E-04	9.7E-04

Company Name: EQT Production, LLC
Facility Name: OXF 160 Wellpad
Project Description: G70-D Application

Line Heaters

Hazardous Air Pollutant (HAP) Potential Emissions:

Pollutant	Emission Factor (lb/MMscf)[1]	Potential Emissions (lb/hr)[2]	Potential Emissions (tons/yr)[3]
HAPs:			
2-Methylnaphthalene	2.4E-05	2.3E-08	1.0E-07
3-Methylchloranthrene	1.8E-06	1.7E-09	7.5E-09
7,12-Dimethylbenz(a)anthracene	1.6E-05	1.5E-08	6.7E-08
Acenaphthene	1.8E-06	1.7E-09	7.5E-09
Acenaphthylene	1.8E-06	1.7E-09	7.5E-09
Anthracene	2.4E-06	2.3E-09	1.0E-08
Benz(a)anthracene	1.8E-06	1.7E-09	7.5E-09
Benzene	2.1E-03	2.0E-06	8.8E-06
Benzo(a)pyrene	1.2E-06	1.1E-09	5.0E-09
Benzo(b)fluoranthene	1.8E-06	1.7E-09	7.5E-09
Benzo(g,h,i)perylene	1.2E-06	1.1E-09	5.0E-09
Benzo(k)fluoranthene	1.8E-06	1.7E-09	7.5E-09
Chrysene	1.8E-06	1.7E-09	7.5E-09
Dibenzo(a,h) anthracene	1.2E-06	1.1E-09	5.0E-09
Dichlorobenzene	1.2E-03	1.1E-06	5.0E-06
Fluoranthene	3.0E-06	2.9E-09	1.3E-08
Fluorene	2.8E-06	2.7E-09	1.2E-08
Formaldehyde	7.5E-02	7.1E-05	3.1E-04
Hexane	1.8E+00	1.7E-03	7.5E-03
Indo(1,2,3-cd)pyrene	1.8E-06	1.7E-09	7.5E-09
Naphthalene	6.1E-04	5.8E-07	2.5E-06
Phenanthrene	1.7E-05	1.6E-08	7.1E-08
Pyrene	5.0E-06	4.8E-09	2.1E-08
Toluene	3.4E-03	3.2E-06	1.4E-05
Arsenic	2.0E-04	1.9E-07	8.3E-07
Beryllium	1.2E-05	1.1E-08	5.0E-08
Cadmium	1.1E-03	1.0E-06	4.6E-06
Chromium	1.4E-03	1.3E-06	5.8E-06
Cobalt	8.4E-05	8.0E-08	3.5E-07
Manganese	3.8E-04	3.6E-07	1.6E-06
Mercury	2.6E-04	2.5E-07	1.1E-06
Nickel	2.1E-03	2.0E-06	8.8E-06
Selenium	2.4E-05	2.3E-08	1.0E-07
Total HAP		**1.8E-03**	**7.9E-03**

[1] Emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, & 1.4-3

[2] Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf).

[3] Annual Emissions $(tons/yr)_{Potential}$ = $(lb/hr)_{Emissions}$ × (Maximum Allowable Operating Hours, 8760 hr/yr) × (1 ton/2000 lb).

[4] GHG Emission factors from Tables C-1 and C-2, 40 CFR 98, Subpart C.

Company Name: EQT Production, LLC
Facility Name: OXF 160 Wellpad
Project Description: G70-D Application

Liquid Loading

Throughput 22,897,000 gal/yr
Capture Efficiency 70% non-tested tanker trucks
Control Efficiency 98% Combustor destruction efficiency

Liquid Loading Emissions

	Uncontrolled Emissions		Uncaptured Emissions		Controlled Emissions	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Propane	60.121	15.632	18.036	4.689	0.842	0.219
Isobutane	11.524	2.996	3.457	0.899	0.161	0.042
n-Butane	24.552	6.383	7.366	1.915	0.344	0.089
Isopentane	7.549	1.963	2.265	0.589	0.106	0.027
n-Pentane	6.816	1.772	2.045	0.532	0.095	0.025
n-Hexane	2.200	0.572	0.660	0.172	0.031	0.008
Cyclohexane	0.122	0.032	0.037	0.010	0.002	0.000
Methylcyclopentane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
n-Heptane	2.448	0.636	0.734	0.191	0.034	0.009
n-Octane	0.692	0.180	0.208	0.054	0.010	0.003
n-Nonane	0.174	0.045	0.052	0.014	0.002	0.001
n-Decane	0.157	0.041	0.047	0.012	0.002	0.001
n-Undecane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dodecane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Triethylene Glycol	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cyclopentane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Isohexane	3.533	0.918	1.060	0.276	0.049	0.013
3-Methylpentane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Neohexane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
2,3-Dimethylbutane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylcyclohexane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Decane, 2-Methyl-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Benzene	0.090	0.023	0.027	0.007	0.001	0.000
Toluene	0.108	0.028	0.032	0.008	0.002	0.000
Ethylbenzene	0.005	0.001	0.001	0.000	0.000	0.000
m-Xylene	0.052	0.014	0.016	0.004	0.001	0.000
Isooctane	0.305	0.079	0.091	0.024	0.004	0.001
Total VOC Emissions:	120.447	31.316	36.134	9.395	1.686	0.438
Total HAP Emissions:	2.759	0.717	0.828	0.215	0.039	0.010

[1] Uncontrolled emissions calculation using Promax (sum of produced water and condensate).
[2] Hourly emissions assume two hours of loading per day, five days per week.

Company Name: EQT Production, LLC
Facility Name: OXF 160 Wellpad
Project Description: G70-D Application

Fugitive Emissions

Fugitive Emissions from Component Leaks

Facility Equipment Type[1]	Valves	Connectors	Open-Ended Lines	Pressure Relief Devices
Wellhead	8	38	0.5	0
Separators	1	6	0	0
Meters/Piping	12	45	0	0
Compressors	12	57	0	0
In-line heaters	14	65	2	1
Dehydrators	24	90	2	2

[1] Table W-1B to Subpart W of Part 98 —Default Average Component Counts for Major Onshore Natural Gas Production

Fugitive VOC/Total Emissions from Component Leaks

Equipment Type	Service	Emission Factors[1] (kg/hr/source)	Facility Equipment Count[2] (units)	TOC Annual Fugitive Emissions (tpy)	Weight Fraction VOC	Weight Fraction HAP	VOC Emissions[3] (tpy)	HAP Emissions[3] (tpy)
Pumps	Light Liquid	0.01990	11	2.02	1.00	0.03	2.02	0.06
Compressor	Gas	0.22800	0	---	0.17	0.01	---	---
Valves	Gas	0.00597	369	21.27	0.17	0.01	3.53	0.11
Pressure Relief Valves	Gas	0.10400	25	24.60	0.17	0.01	4.08	0.13
Open-Ended Lines	All	0.00170	27	0.44	0.17	0.01	0.07	2.3E-03
Connectors	All	0.00183	1,626	28.73	0.17	0.01	4.77	0.15
Intermittent Pneumatic Devices[4]	Gas	13.5	35	---	---	---	6.17	0.19
			Emission Totals:	**77.07**	**---**	**---**	**20.64**	**0.64**

[1] U.S. EPA. Office of Air Quality Planning and Standards. *Protocol for Equipment Leak Emission Estimates.* Table 2-1. (Research Triangle Park, NC: U.S. EPA EPA-453/R-95-017, 1995). SOCMI factors were used as it was representative of natural gas liquids extraction. The pneumatic controller value is from 40 CFR 98 Subpart W, Table W-1A (units of scf/hr/component). Pneumatic assumes operation 1/3 of the year.

[2] Assumes one pump for each tank and one meter per wellhead. Pressure relief valves count includes one Emergency Pressure Relief valve and one lock-down hatch for each storage tank. Pneumatic devices assume 5 per well. A 50% compliance margin is added to the component counts based on Subpart W counts.

[3] Potential emissions VOC/HAP (tpy) = Emission factor (kg/hr/source) * Number of Sources * Weight % VOC/HAP x 2.2046 (lb/kg) x 8,760 (hr/yr) ÷ 2,000 (lb/ton)

[4] Potential emissions VOC/HAP (tpy) = Gas volume vented (scf/yr) * Molar weight of natural gas (lb/lb-mol) * Weight % VOC/HAP ÷ 100 ÷ 379 (scf/lb-mol) ÷ 2,000 (lb/ton)

Company Name: EQT Production, LLC
Facility Name: OXF 160 Wellpad
Project Description: G70-D Application

Fugitive Emissions

Fugitive Specific HAP Emissions from Component Leaks

Equipment Type	Service	Emission Factors[1] (kg/hr/source)	Facility Equipment Count[2] (units)	TOC Annual Fugitive Emissions (tpy)	Benzene Emissions[3] (tpy)	Toluene Emissions[3] (tpy)	Ethylbenzene Emissions[3] (tpy)	Xylene Emissions[3] (tpy)	n-Hexane Emissions[4] (tpy)
Pumps	Light Liquid	0.01990	11	2.02	1.5E-04	3.6E-04	<0.01	2.1E-04	0.01
Compressor	Gas	0.22800	0	---	---	---	---	---	---
Valves	Gas	0.00597	369	21.27	1.6E-03	3.8E-03	<0.01	2.2E-03	0.07
Pressure Relief Valves	Gas	0.10400	25	24.60	1.9E-03	4.4E-03	<0.01	2.6E-03	0.08
Open-Ended Lines	All	0.00170	27	0.44	3.4E-05	8.0E-05	<0.01	4.6E-05	1.4E-03
Connectors	All	0.00183	1,626	28.73	2.2E-03	0.01	<0.01	3.0E-03	0.09
Intermittent Pneumatic Devices[4]	Gas	13.5	35	---	2.8E-03	0.01	<0.01	3.9E-03	0.11
			Emission Totals:	**77.07**	**0.01**	**0.02**	**<0.01**	**0.01**	**0.35**

[1] U.S. EPA. Office of Air Quality Planning and Standards. *Protocol for Equipment Leak Emission Estimates.* Table 2-1. (Research Triangle Park, NC: U.S. EPA EPA-453/R-95-017, 1995). SOCMI factors were used as it was representative of natural gas liquids extraction. The pneumatic controller value is from 40 CFR 98 Subpart W, Table W-1A. Pneumatic assumes operation 1/3 of the year.

[2] Assumes one pump for each tank and one meter per wellhead. Pressure relief valves count includes one Emergency Pressure Relief valve and one lock-down hatch for each storage tank. Pneumatic devices assume 5 per well. A 50% compliance margin is added to the component counts based on Subpart W counts.

[3] Potential emissions HAP (tpy) = Emission factor (kg/hr/source) * Number of Sources * Weight % HAP x 2.2046 (lb/kg) x 8,760 (hr/yr) ÷ 2,000 (lb/ton)

[4] Potential emissions HAP (tpy) = Gas volume vented (scf/yr) * Molar weight of natural gas (lb/lb-mol) * Weight % HAP ÷ 100 ÷ 379 (scf/lb-mol) ÷ 2,000 (lb/ton)

GHG Fugitive Emissions from Component Leaks

Component	Component Count	GHG Emission Factor[1] scf/hr/component	CH_4 Emissions[2,3] (tpy)	CO_2 Emissions[2,3] (tpy)	CO_2e Emissions[4] (tpy)
Pumps	11	0.01	0.02	1.0E-04	0.38
Compressor	0	4.17	---	---	---
Valves	369	0.027	1.46	0.01	36.47
Pressure Relief Devices	25	0.04	0.14	9.7E-04	3.59
Open-Ended Lines	27	0.061	0.24	1.6E-03	6.03
Connectors	1,626	0.003	0.71	4.8E-03	17.86
Intermittent Pneumatic Devices	35	6	10.25	0.07	256.27
Total			**12.82**	**0.09**	**320.60**

[1] Population emission factors for gas service in the Eastern U.S. from *Table W-1A of Subpart W - Default Whole Gas Emission Factors for Onshore Production* , 40 CFR 98, Subpart W (table W-6 for compressor). Pneumatic assumes operation 1/3 of the year.

[2] Calculated in accordance with Equations W-32a, W-35 and W-36 in Subpart W of 40 CFR 98. See footnote 4 above for sample calculation.

[3] Potential emissions VOC/HAP (tpy) = Gas volume vented (scf/yr) * Molar weight of natural gas (lb/lb-mol) * Weight % VOC/HAP ÷ 100 ÷ 379 (scf/lb-mol) ÷ 2,000 (lb/ton)
Mole fractions of CH_4 and CO_2 based on gas analysis:
CH_4: 79% CO_2: 0.20%

[4] Carbon equivalent emissions (CO_2e) are based on the following Global Warming Potentials (GWP) from 40 CFR Part 98, Table A-1:
Carbon Dioxide (CO_2): 1
Methane (CH_4): 25

Company Name: EQT Production, LLC
Facility Name: OXF 160 Wellpad
Project Description: G70-D Application

Fugitive Emissions

Fugitive Emissions from Fuel Cells

Source	Number of Units	CO_2 Emissions Per Unit (tpy)	Total CO_2 Emissions (tpy)	Total CO_2e Emissions (tpy)
Natural Gas Source	2	7.96	15.92	15.92
Propane Gas Source	2	10.24	20.47	20.47
Total		**7.96**	**36.39**	**36.39**

Reaction for Fuel Cells is as follows:

Natural Gas
$CH4 + 2 (O2+3.76N2) = CO2 + 2H2O + 7.52N2$

Propane
$C3H8 + 5 (O2+3.76N2) = 3CO2 + 4H2O + 18.8N2$

Natural Gas Fuel Flow Rate	7	liters/min for 1350 watts (from engineering design)
Natural Gas Mole Ratio	1	mol CO2/mol fuel
Propane Gas Fuel Flow Rate	3	liters/min for 1350 watts (from engineering design)
Propane Gas Mole Ratio	3	mol CO2/mol fuel

Molecular Weights:			Molar Volume	
CH_4	16	g/g-mol	22.41	l/g-mol
C_3H_8	44	g/g-mol		
CO_2	44	g/g-mol		

Potential CO_2 (tpy) = Flow Rate of Fuel (liters/min) ÷ Molar Volume (L/g-mol) x mole ratio (mol CO2/mol fuel) x Molecular Weight of CO2 (g/g-mol) x 60 min/hr x 8,760 hr/yr ÷ (453.6 g/lb) ÷ (2,000 lb/ton)

Company Name: EQT Production, LLC
Facility Name: OXF 160 Wellpad
Project Description: G70-D Application

Haul Roads

Estimated Potential Road Fugitive Emissions

Unpaved Road Emissions

Unpaved Roads: $E\ (lb/VMT) = k(s/12)^a(W/3)^b*[(365-p)/365]$

	PM	PM_{10}	$PM_{2.5}$	
k Factor (lb/VMT)	4.9	1.5	0.15	AP-42 Table 13.2.2-2 (Final, 11/06)
Silt content, s	4.8 %			AP-42 Table 13.2.2-1 (11/06), for Sand and Gravel Processing
Number of Rain Days, p	150			AP-42 Figure 13.2.1-2
a	0.7	0.9	0.9	AP-42 Table 13.2.2-2 (Final, 11/06)
b	0.45	0.45	0.45	AP-42 Table 13.2.2-2 (Final, 11/06)

Description	Weight of Empty Truck (tons)	Weight of Truck w/ Max Load (tons)	Mean Vehicle Weight (tons)	Length of Unpaved Road Traveled (mile)	Trips Per Year	Mileage Per Year	Control (%)	Emissions (tpy) PM	PM_{10}	$PM_{2.5}$
Liquids Hauling	20	40	30	0.75	5,724	8,550	0	18.31	4.67	0.47
Employee Vehicles	3	3	3	0.75	200	299	0	0.23	0.06	0.01
Total Potential Emissions								**18.54**	**4.72**	**0.47**

Company Name: EQT Production, LLC
Facility Name: OXF 160 Wellpad
Project Description: G70-D Application

Gas Analysis

Sample Location: OXF 121 Gas Analysis - 512425
Sample Date: 5/20/2013
HHV (Btu/scf): 1,240 Note: A conservatively low BTU content of 1,050 was used for calculations.

Constituent	Natural Gas Stream Speciation (Mole %)	Molecular Weight	Molar Weight	Average Weight Fraction	Natural Gas Stream Speciation (Wt. %)
Carbon Dioxide	0.195	44.01	0.09	0.00	0.420
Nitrogen	0.532	28.01	0.15	0.01	0.729
Methane	78.965	16.04	12.67	0.62	61.983
Ethane	13.780	30.07	4.14	0.20	20.278
Propane	4.195	44.10	1.85	0.09	9.053
Isobutane	0.507	58.12	0.29	0.01	1.442
n-Butane	1.013	58.12	0.59	0.03	2.881
Isopentane	0.249	72.15	0.18	0.01	0.879
n-Pentane	0.239	72.15	0.17	0.01	0.844
Cyclopentane	<0.001	70.1	0.0	0.0	0.000
n-Hexane	0.073	86.18	0.06	0.00	0.308
Cyclohexane	0.011	84.16	0.01	0.00	0.045
Other Hexanes	0.113	86.18	0.10	0.00	0.477
Heptanes	0.079	100.21	0.08	0.00	0.387
Methylcyclohexane	<0.001	98.19	0.00	0.00	0.000
2,2,4-Trimethylpentane	0.031	114.23	0.04	0.00	0.173
Benzene*	0.002	78.11	0.00	0.00	0.008
Toluene*	0.004	92.14	0.00	0.00	0.018
Ethylbenzene*	<0.001	106.17	0.00	0.00	0.000
Xylenes*	0.002	106.16	0.00	0.00	0.010
C8 + Heavies	0.010	130.80	0.01	0.00	0.064
Totals	100.000		20.43	1.00	100

TOC (Total)	99.27	98.85
VOC (Total)	6.53	16.59
HAP (Total)	0.11	0.52

```
*******************************************************************************
******
*     Project Setup Information
    *
*******************************************************************************
******
Project File              : \\tsclient\Z\Client\EQT Corporation\West Virginia\WV
Wells\163901.0058 WV Wells 2016\OXF 160\03 Draft\20160310_OXF-160 G70-C Application
\Att S Emission Calcs\01 E&P TANK\20160310_EQT_OXF160_Sand Separator Tank.ept

Flowsheet Selection       : Oil Tank with Separator
Calculation Method        : RVP Distillation
Control Efficiency        : 0.0%
Known Separator Stream    : Low Pressure Oil
Entering Air Composition  : No

Filed Name                : OXF-160 Wellpad
Well Name                 : Sand Separator Tank
Well ID                   : Condensate Analysis from OXF-160
Date                      : 2016.03.10


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

Separator Pressure        : 407.00[psig]
Separator Temperature     : 60.00[F]
Ambient Pressure          : 14.70[psia]
Ambient Temperature       : 55.00[F]
C10+ SG                   : 0.8004
C10+ MW                   : 206.984

-- Low Pressure Oil
-------------------------------------------------------------------------
   No.    Component             mol %
   1      H2S                    0.0000
   2      O2                     0.0000
   3      CO2                    0.0770
   4      N2                     0.0000
   5      C1                    11.2090
   6      C2                     8.5530
   7      C3                     7.3260
   8      i-C4                   1.9200
   9      n-C4                   5.3270
   10     i-C5                   3.0530
   11     n-C5                   3.8030
   12     C6                     3.4440
   13     C7                    11.4510
   14     C8                    10.4960
   15     C9                     7.4320
   16     C10+                  20.2320
   17     Benzene                0.1360
   18     Toluene                0.7270
   19     E-Benzene              0.1120
   20     Xylenes                1.2580
   21     n-C6                   3.4200
   22     224Trimethylp          0.0240
```

-- Sales Oil

Production Rate : 0.1[bbl/day]
Days of Annual Operation : 365 [days/year]
API Gravity : 59.11
Reid Vapor Pressure : 10.60[psia]

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

-- Emission Summary

Item	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]	Controlled [ton/yr]	Controlled [lb/hr]
Page 1				E&P TANK
Total HAPs	0.000	0.000	0.000	0.000
Total HC	0.463	0.106	0.463	0.106
VOCs, C2+	0.371	0.085	0.371	0.085
VOCs, C3+	0.240	0.055	0.240	0.055

Uncontrolled Recovery Info.

Vapor	30.6200 x1E-3	[MSCFD]
HC Vapor	30.5400 x1E-3	[MSCFD]
GOR	306.20	[SCF/bbl]

-- Emission Composition

No	Component	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]	Controlled [ton/yr]	Controlled [lb/hr]
1	H2S	0.000	0.000	0.000	0.000
2	O2	0.000	0.000	0.000	0.000
3	CO2	0.002	0.000	0.002	0.000
4	N2	0.000	0.000	0.000	0.000
5	C1	0.093	0.021	0.093	0.021
6	C2	0.131	0.030	0.131	0.030
7	C3	0.119	0.027	0.119	0.027
8	i-C4	0.024	0.005	0.024	0.005
9	n-C4	0.052	0.012	0.052	0.012
10	i-C5	0.016	0.004	0.016	0.004
11	n-C5	0.014	0.003	0.014	0.003
12	C6	0.004	0.001	0.004	0.001
13	C7	0.005	0.001	0.005	0.001
14	C8	0.001	0.000	0.001	0.000
15	C9	0.000	0.000	0.000	0.000
16	C10+	0.000	0.000	0.000	0.000
17	Benzene	0.000	0.000	0.000	0.000
18	Toluene	0.000	0.000	0.000	0.000
19	E-Benzene	0.000	0.000	0.000	0.000
20	Xylenes	0.000	0.000	0.000	0.000
21	n-C6	0.003	0.001	0.003	0.001
22	224Trimethylp	0.000	0.000	0.000	0.000
	Total	0.464	0.106	0.464	0.106

-- Stream Data

No.	Component	MW	LP Oil	Flash Oil	Sale Oil	Flash Gas	W&S Gas

Total Emissions

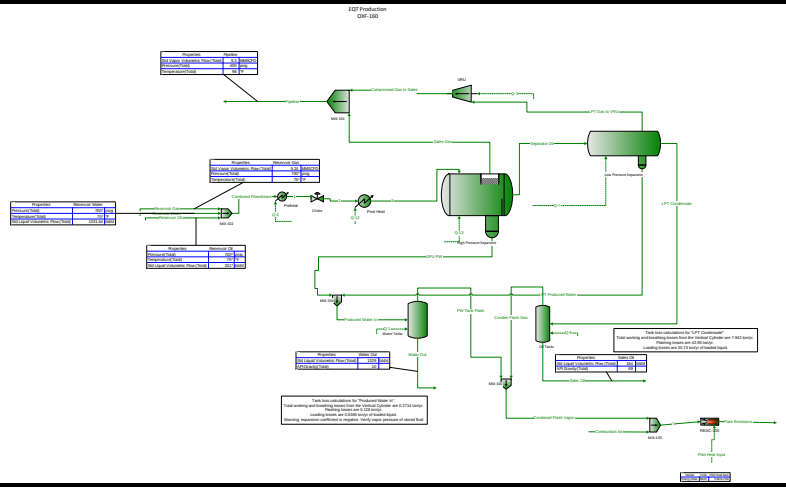
			mol %	mol %	mol %	mol %	mol %	mol %
1	H2S	34.80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	O2	32.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	CO2	44.01	0.0770	0.0059	0.0000	0.2698	0.2496	0.2686
4	N2	28.01	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
5	C1	16.04	11.2090	0.2680	0.0000	40.8883	11.3545	39.1114
6	C2	30.07	8.5530	1.3068	0.1435	28.2096	49.4331	29.4865
7	C3	44.10	7.3260	3.4365	2.9127	17.8768	25.1133	18.3122
8	i-C4	58.12	1.9200	1.5837	1.5460	2.8322	3.1435	2.8509
9	n-C4	58.12	5.3270	5.0689	5.0335	6.0271	6.5353	6.0576
10	i-C5	72.15	3.0530	3.6399	3.6903	1.4610	1.5547	1.4666
11	n-C5	72.15	3.8030	4.7160	4.7958	1.3264	1.4132	1.3317
12	C6	86.16	3.4440	4.5810	4.6824	0.3596	0.3865	0.3613
13	C7	100.20	11.4510	15.5442	15.9108	0.3475	0.3781	0.3493
14	C8	114.23	10.4960	14.3336	14.6777	0.0859	0.0949	0.0865
15	C9	128.28	7.4320	10.1651	10.4103	0.0180	0.0217	0.0182
16	C10+	206.98	20.2320	27.6903	28.3596	0.0001	0.0001	0.0001
17	Benzene	78.11	0.1360	0.1824	0.1865	0.0102	0.0110	0.0102
18	Toluene	92.13	0.7270	0.9902	1.0138	0.0130	0.0143	0.0131
19	E-Benzene	106.17	0.1120	0.1531	0.1568	0.0006	0.0006	0.0006
20	Xylenes	106.17	1.2580	1.7198	1.7612	0.0054	0.0060	0.0054
21	n-C6	86.18	3.4200	4.5820	4.6858	0.2679	0.2890	0.2692
22	224Trimethylp	114.24	0.0240	0.0326	0.0334	0.0006	0.0006	0.0006
	MW		98.67	123.54	125.63	31.22	36.74	31.55
	Stream Mole Ratio		1.0000	0.7307	0.7134	0.2693	0.0172	0.2866
	Heating Value	[BTU/SCF]				1818.91	2117.27	1836.86
	Gas Gravity	[Gas/Air]				1.08	1.27	1.09
	Bubble Pt. @ 100F	[psia]	438.80	29.37	13.19			

	RVP @ 100F	[psia]	107.09	16.29	10.94			

Spec. Gravity @ 100F	0.660	0.689	0.691

OXF-160
Plant Schematic

Client Name:	EQT Production	Job: V1.0
Location:	OXF 160 Wellpad	
Flowsheet:	OXF-160	



Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	EQT Production	Job: V1.0
Location:	OXF 160 Wellpad	
Flowsheet:	OXF-160	

Connections

	Combined Flash Vapor	Pipeline	Reservoir Gas	Reservoir Oil	Reservoir Water
From Block	MIX-100	MIX-101	--	--	--
To Block	MIX-105	--	MIX-102	MIX-102	MIX-102

Stream Composition

Mole Fraction	Combined Flash Vapor	Pipeline	Reservoir Gas	Reservoir Oil	Reservoir Water
Nitrogen	0.00173398	0.00527783	0.00532 *	0 *	0 *
Methane	0.518769	0.785533	0.78965 *	0.11209 *	0 *
CO2	0.0105261	0.00193151	0.00195 *	0.00077 *	0 *
Ethane	0.222087	0.138215	0.1378 *	0.08553 *	0 *
Propane	0.129479	0.0425334	0.04195 *	0.07326 *	0 *
Isobutane	0.0205859	0.00518606	0.00507 *	0.0192 *	0 *
n-Butane	0.0457698	0.0104	0.01013 *	0.05327 *	0 *
Isopentane	0.0116085	0.00258298	0.00249 *	0.03053 *	0 *
n-Pentane	0.0109661	0.00251478	0.00239 *	0.03803 *	0 *
n-Hexane	0.00303005	0.000779996	0.00073 *	0.0342 *	0 *
Methylcyclopentane	0	0	0 *	0 *	0 *
Benzene	0.000215718	2.5474E-05	2E-05 *	0.00136 *	0 *
Cyclohexane	0.000252479	5.34363E-05	0.00011 *	0 *	0 *
n-Heptane	0.00314184	0.000975612	0.00079 *	0.11451 *	0 *
n-Octane	0.00082381	0.000312617	3E-05 *	0.10496 *	0 *
n-Nonane	0.00019417	8.96602E-05	4E-05 *	0.07432 *	0 *
n-Decane	0.000168738	9.72059E-05	3E-05 *	0.20232 *	0 *
n-Undecane	0	0	0 *	0 *	0 *
Dodecane	0	0	0 *	0 *	0 *
Water	0.015027	0.00216388	0 *	0 *	1 *
Triethylene Glycol	0	0	0 *	0 *	0 *
Oxygen	0	0	0 *	0 *	0 *
Argon	0	0	0 *	0 *	0 *
Carbon Monoxide	0	0	0 *	0 *	0 *
Cyclopentane	0	0	0 *	0 *	0 *
Isohexane	0.0047047	0.00113983	0.00113 *	0.03444 *	0 *
3-Methylpentane	0	0	0 *	0 *	0 *
Neohexane	0	0	0 *	0 *	0 *
2,3-Dimethylbutane	0	0	0 *	0 *	0 *
Methylcyclohexane	0	0	0 *	0 *	0 *
Isooctane	0.000319079	9.72047E-05	0.00031 *	0.00024 *	0 *
Decane, 2-Methyl-	0	0	0 *	0 *	0 *
Toluene	0.000389268	5.50538E-05	4E-05 *	0.00727 *	0 *
m-Xylene	0.000189813	3.29019E-05	2E-05 *	0.01258 *	0 *
Ethylbenzene	1.68252E-05	2.92552E-06	0 *	0.00112 *	0 *

Mass Flow	Combined Flash Vapor lb/h	Pipeline lb/h	Reservoir Gas lb/h	Reservoir Oil lb/h	Reservoir Water lb/h
Nitrogen	0.0490849	151.122	151.172 *	0 *	0 *
Methane	8.40976	12880.7	12849.9 *	39.8419 *	0 *
CO2	0.468116	86.8858	87.0512 *	0.750826 *	0 *
Ethane	6.7481	4247.97	4203.03 *	56.9824 *	0 *
Propane	5.76944	1917.04	1876.38 *	71.5756 *	0 *
Isobutane	1.20907	308.096	298.912 *	24.7255 *	0 *
n-Butane	2.68818	617.845	597.235 *	68.6005 *	0 *
Isopentane	0.846338	190.483	182.231 *	48.8043 *	0 *
n-Pentane	0.799501	185.454	174.913 *	60.7936 *	0 *
n-Hexane	0.263859	68.7039	63.8116 *	65.2998 *	0 *
Methylcyclopentane	0	0	0 *	0 *	0 *
Benzene	0.0170271	2.03385	1.58468 *	2.35374 *	0 *
Cyclohexane	0.0214717	4.59669	9.39052 *	0 *	0 *

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	EQT Production	Job: V1.0
Location:	OXF 160 Wellpad	
Flowsheet:	OXF-160	

Mass Flow	Combined Flash Vapor lb/h	Pipeline lb/h	Reservoir Gas lb/h	Reservoir Oil lb/h	Reservoir Water lb/h
n-Heptane	0.318126	99.9216	80.2966 *	254.227 *	0 *
n-Octane	0.0950911	36.5	3.47608 *	265.644 *	0 *
n-Nonane	0.0251649	11.7539	5.2039 *	211.195 *	0 *
n-Decane	0.0242606	14.1367	4.32976 *	637.808 *	0 *
n-Undecane	0	0	0 *	0 *	0 *
Dodecane	0	0	0 *	0 *	0 *
Water	0.273559	39.8457	0 *	0 *	19427.8 *
Triethylene Glycol	0	0	0 *	0 *	0 *
Oxygen	0	0	0 *	0 *	0 *
Argon	0	0	0 *	0 *	0 *
Carbon Monoxide	0	0	0 *	0 *	0 *
Cyclopentane	0	0	0 *	0 *	0 *
Isohexane	0.409688	100.399	98.7769 *	65.758 *	0 *
3-Methylpentane	0	0	0 *	0 *	0 *
Neohexane	0	0	0 *	0 *	0 *
2,3-Dimethylbutane	0	0	0 *	0 *	0 *
Methylcyclohexane	0	0	0 *	0 *	0 *
Isooctane	0.0368308	11.3493	35.9195 *	0.607419 *	0 *
Decane, 2-Methyl-	0	0	0 *	0 *	0 *
Toluene	0.0362433	5.18483	3.73848 *	14.8415 *	0 *
m-Xylene	0.0203631	3.57033	2.1538 *	29.5913 *	0 *
Ethylbenzene	0.00180501	0.317461	0 *	2.63452 *	0 *

Volumetric Flow	Combined Flash Vapor ft^3/h	Pipeline ft^3/h	Reservoir Gas ft^3/h	Reservoir Oil gpm	Reservoir Water gpm
Nitrogen	0.651936	80.8223	47.2569	0	0
Methane	194.298	11185.2	6011.26	0.255447	0
CO2	3.93022	25.7741	12.7251	0.00111086	0
Ethane	82.5458	1680.81	713.312	0.245055	0
Propane	47.8212	447.775	138.199	0.268708	0
Isobutane	7.56396	48.1717	9.53992	0.0865813	0
n-Butane	16.794	91.7302	13.4371	0.233193	0
Isopentane	4.23746	19.4598	-0.329696	0.155728	0
n-Pentane	3.99859	18.28	-1.04684	0.192582	0
n-Hexane	1.09725	4.39315	-1.64272	0.196285	0
Methylcyclopentane	0	0	0	0	0
Benzene	0.078535	0.170652	-0.0221441	0.00523079	0
Cyclohexane	0.0916714	0.322866	-0.199771	0	0
n-Heptane	1.13062	3.92384	-3.06402	0.737824	0
n-Octane	0.294591	0.81213	-0.146923	0.744026	0
n-Nonane	0.0689213	0.0802962	-0.208329	0.575604	0
n-Decane	0.0595065	-0.0690641	-0.129152	1.70697	0
n-Undecane	0	0	0	0	0
Dodecane	0	0	0	0	0
Water	5.62056	29.7885	0	0	38.8964
Triethylene Glycol	0	0	0	0	0
Oxygen	0	0	0	0	0
Argon	0	0	0	0	0
Carbon Monoxide	0	0	0	0	0
Cyclopentane	0	0	0	0	0
Isohexane	1.70638	6.89385	-2.01282	0.199703	0
3-Methylpentane	0	0	0	0	0
Neohexane	0	0	0	0	0
2,3-Dimethylbutane	0	0	0	0	0
Methylcyclohexane	0	0	0	0	0
Isooctane	0.114735	0.388713	-1.19629	0.0017227	0
Decane, 2-Methyl-	0	0	0	0	0
Toluene	0.140752	0.273411	-0.116375	0.0332788	0
m-Xylene	0.0681959	0.117096	-0.0783298	0.0664651	0

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	EQT Production	Job: V1.0
Location:	OXF 160 Wellpad	
Flowsheet:	OXF-160	

Volumetric Flow	Combined Flash Vapor ft^3/h	Pipeline ft^3/h	Reservoir Gas ft^3/h	Reservoir Oil gpm	Reservoir Water gpm
Ethylbenzene	0.00604891	0.0108359	0	0.00590066	0

Stream Properties

Property	Units	Combined Flash Vapor	Pipeline	Reservoir Gas	Reservoir Oil	Reservoir Water
Temperature	°F	69.8033	97.9829	75 *	75 *	75 *
Pressure	psig	0.625	400	700 *	700 *	700 *
Mole Fraction Vapor		1	1	0.999641	0	0
Mole Fraction Light Liquid		0	0	0.000358505	1	1
Mole Fraction Heavy Liquid		0	0	0	0	0
Molecular Weight	lb/lbmol	28.2345	20.5296	20.436	86.7479	18.0153
Mass Density	lb/ft^3	0.0766308	1.53784	2.98888	41.9564	62.2722
Molar Flow	lbmol/h	1.0105	1022.13	1014.36	22.1566	1078.41
Mass Flow	lb/h	28.5311	20984	20729.5	1922.04	19427.8
Vapor Volumetric Flow	ft^3/h	372.319	13645.1	6935.53	45.8103	311.982
Liquid Volumetric Flow	gpm	46.4189	1701.21	864.69	5.71142	38.8964
Std Vapor Volumetric Flow	MMSCFD	0.00920328	9.30916	9.23844	0.201793	9.82171
Specific Gravity		0.974861	0.708833		0.672712	0.998448
API Gravity					76.4041	9.91415
Enthalpy	Btu/h	-40449.5	-3.49713E+07	-3.50225E+07	-1.86742E+06	-1.32476E+08
Net Ideal Gas Heating Value	Btu/ft^3	1477.89	1120.15	1117.56	4418.75	0
Net Liquid Heating Value	Btu/lb	19746.1	20645.7	20695.2	19174.9	-1059.76
Std Liquid Volumetric Flow	sgpm	0.140916	123.381	122.38 *	5.8625 *	38.8376 *

Remarks

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	EQT Production	Job: V1.0
Location:	OXF 160 Wellpad	
Flowsheet:	OXF-160	

Connections

	Sales Oil	Water Out			
From Block	Oil Tanks	Water Tanks			
To Block	--	--			

Stream Composition

Mole Fraction	Sales Oil	Water Out			
Nitrogen	2.49595E-07	3.66151E-08			
Methane	0.000930407	1.99482E-05			
CO2	2.58246E-05	9.0875E-06			
Ethane	0.0108952	6.1571E-06			
Propane	0.0365805	7.78448E-07			
Isobutane	0.0158386	4.36306E-08			
n-Butane	0.0500571	1.84633E-07			
Isopentane	0.0353519	1.64453E-08			
n-Pentane	0.044031	3.24102E-09			
n-Hexane	0.0448337	6.56357E-10			
Methylcyclopentane	0	0			
Benzene	0.00150126	7.38367E-07			
Cyclohexane	0.00364223	7.37313E-09			
n-Heptane	0.150198	3.36089E-10			
n-Octane	0.130766	1.18753E-11			
n-Nonane	0.102487	2.75606E-12			
n-Decane	0.283526	2.38121E-13			
n-Undecane	0	0			
Dodecane	0	0			
Water	4.38205E-05	0.999962			
Triethylene Glycol	0	0			
Oxygen	0	0			
Argon	0	0			
Carbon Monoxide	0	0			
Cyclopentane	0	0			
Isohexane	0.0475042	1.59392E-09			
3-Methylpentane	0	0			
Neohexane	0	0			
2,3-Dimethylbutane	0	0			
Methylcyclohexane	0	0			
Isooctane	0.0141385	4.29828E-11			
Decane, 2-Methyl-	0	0			
Toluene	0.00923718	1.10866E-06			
m-Xylene	0.0170124	3.38973E-07			
Ethylbenzene	0.00139807	4.13532E-08			

Mass Flow	Sales Oil lb/h	Water Out lb/h			
Nitrogen	0.000108844	0.00110389			
Methane	0.232351	0.34441			
CO2	0.0176922	0.43042			
Ethane	5.09986	0.199249			
Propane	25.11	0.0369425			
Isobutane	14.3305	0.00272919			
n-Butane	45.2907	0.0115492			
Isopentane	39.7048	0.00127695			
n-Pentane	49.4526	0.000251658			
n-Hexane	60.1436	6.0873E-05			
Methylcyclopentane	0	0			
Benzene	1.82546	0.0620712			
Cyclohexane	4.77169	0.000667815			
n-Heptane	234.284	3.62436E-05			
n-Octane	232.525	1.45989E-06			
n-Nonane	204.619	3.80421E-07			

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	EQT Production
Location:	OXF 160 Wellpad
Flowsheet:	OXF-160

Job: V1.0

Mass Flow	Sales Oil lb/h	Water Out lb/h			
n-Decane	627.977	3.64626E-08			
n-Undecane	0	0			
Dodecane	0	0			
Water	0.0122891	19387.7			
Triethylene Glycol	0	0			
Oxygen	0	0			
Argon	0	0			
Carbon Monoxide	0	0			
Cyclopentane	0	0			
Isohexane	63.726	0.000147826			
3-Methylpentane	0	0			
Neohexane	0	0			
2,3-Dimethylbutane	0	0			
Methylcyclohexane	0	0			
Isooctane	25.1408	5.28409E-06			
Decane, 2-Methyl-	0	0			
Toluene	13.249	0.109937			
m-Xylene	28.1157	0.03873			
Ethylbenzene	2.31053	0.00472489			

Volumetric Flow	Sales Oil gpm	Water Out gpm			
Nitrogen	3.37604E-07	2.94817E-06			
Methane	0.00131517	0.00168319			
CO2	2.00488E-05	0.000673236			
Ethane	0.0204348	0.000666006			
Propane	0.0909346	0.000105654			
Isobutane	0.0494202	7.13762E-06			
n-Butane	0.151568	2.98256E-05			
Isopentane	0.126344	3.07026E-06			
n-Pentane	0.156084	6.06257E-07			
n-Hexane	0.181527	1.39386E-07			
Methylcyclopentane	0	0			
Benzene	0.00405356	0.000115751			
Cyclohexane	0.0122092	1.34909E-06			
n-Heptane	0.686506	8.02909E-08			
n-Octane	0.659896	3.13218E-09			
n-Nonane	0.566559	7.96872E-10			
n-Decane	1.71099	7.51687E-11			
n-Undecane	0	0			
Dodecane	0	0			
Water	-1.8979E-05	38.8101			
Triethylene Glycol	0	0			
Oxygen	0	0			
Argon	0	0			
Carbon Monoxide	0	0			
Cyclopentane	0	0			
Isohexane	0.194463	3.38975E-07			
3-Methylpentane	0	0			
Neohexane	0	0			
2,3-Dimethylbutane	0	0			
Methylcyclohexane	0	0			
Isooctane	0.0724671	1.12203E-08			
Decane, 2-Methyl-	0	0			
Toluene	0.029983	0.000202942			
m-Xylene	0.0640642	7.0916E-05			
Ethylbenzene	0.00525841	8.60545E-06			

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	EQT Production	Job: V1.0
Location:	OXF 160 Wellpad	
Flowsheet:	OXF-160	

Stream Properties

Property	Units	Sales Oil	Water Out			
Temperature	°F	70 *	70			
Pressure	psig	0.625	0.625			
Mole Fraction Vapor		0	0			
Mole Fraction Light Liquid		1	1			
Mole Fraction Heavy Liquid		0	0			
Molecular Weight	lb/lbmol	107.789	18.0157			
Mass Density	lb/ft^3	43.7279	62.28			
Molar Flow	lbmol/h	15.5669	1076.22			
Mass Flow	lb/h	1677.94	19388.9			
Vapor Volumetric Flow	ft^3/h	38.3723	311.318			
Liquid Volumetric Flow	gpm	4.78408	38.8137			
Std Vapor Volumetric Flow	MMSCFD	0.141777	9.8018			
Specific Gravity		0.701116	0.998573			
API Gravity		68.9669	10.0027			
Enthalpy	Btu/h	-1.56059E+06	-1.32342E+08			
Net Ideal Gas Heating Value	Btu/ft^3	5462.64	0.0399889			
Net Liquid Heating Value	Btu/lb	19073.6	-1058.85			
Std Liquid Volumetric Flow	sgpm	4.79603	38.7625			

Remarks

Process Streams Report
Stream: Combined Flash Vapor
Phases Grouped by Columns

Client Name:	EQT Production	Job: V1.0	
Location:	OXF 160 Wellpad	Modified: 11:44 AM, 10/30/2015	
Flowsheet:	OXF-160	Status: Solved 12:48 PM, 10/12/2016	

Connections

From:	To:
MIX-100	MIX-105

Composition

Mole Fraction	Total	Vapor			
Nitrogen	0.00173398	0.00173398			
Methane	0.518769	0.518769			
CO2	0.0105261	0.0105261			
Ethane	0.222087	0.222087			
Propane	0.129479	0.129479			
Isobutane	0.0205859	0.0205859			
n-Butane	0.0457698	0.0457698			
Isopentane	0.0116085	0.0116085			
n-Pentane	0.0109661	0.0109661			
n-Hexane	0.00303005	0.00303005			
Methylcyclopentane	0	0			
Benzene	0.000215718	0.000215718			
Cyclohexane	0.000252479	0.000252479			
n-Heptane	0.00314184	0.00314184			
n-Octane	0.00082381	0.00082381			
n-Nonane	0.00019417	0.00019417			
n-Decane	0.000168738	0.000168738			
n-Undecane	0	0			
Dodecane	0	0			
Water	0.015027	0.015027			
Triethylene Glycol	0	0			
Oxygen	0	0			
Argon	0	0			
Carbon Monoxide	0	0			
Cyclopentane	0	0			
Isohexane	0.0047047	0.0047047			
3-Methylpentane	0	0			
Neohexane	0	0			
2,3-Dimethylbutane	0	0			
Methylcyclohexane	0	0			
Isooctane	0.000319079	0.000319079			
Decane, 2-Methyl-	0	0			
Toluene	0.000389268	0.000389268			
m-Xylene	0.000189813	0.000189813			
Ethylbenzene	1.68252E-05	1.68252E-05			

Mass Flow	Total lb/h	Vapor lb/h			
Nitrogen	0.0490849	0.0490849			
Methane	8.40976	8.40976			
CO2	0.468116	0.468116			
Ethane	6.7481	6.7481			
Propane	5.76944	5.76944			
Isobutane	1.20907	1.20907			
n-Butane	2.68818	2.68818			
Isopentane	0.846338	0.846338			
n-Pentane	0.799501	0.799501			
n-Hexane	0.263859	0.263859			
Methylcyclopentane	0	0			
Benzene	0.0170271	0.0170271			
Cyclohexane	0.0214717	0.0214717			
n-Heptane	0.318126	0.318126			
n-Octane	0.0950911	0.0950911			
n-Nonane	0.0251649	0.0251649			
n-Decane	0.0242606	0.0242606			
n-Undecane	0	0			

Process Streams Report
Stream: Combined Flash Vapor
Phases Grouped by Columns

Client Name:	EQT Production	Job: V1.0	
Location:	OXF 160 Wellpad	Modified: 11:44 AM, 10/30/2015	
Flowsheet:	OXF-160	Status: Solved 12:48 PM, 10/12/2016	

Mass Flow	Total lb/h	Vapor lb/h			
Dodecane	0	0			
Water	0.273559	0.273559			
Triethylene Glycol	0	0			
Oxygen	0	0			
Argon	0	0			
Carbon Monoxide	0	0			
Cyclopentane	0	0			
Isohexane	0.409688	0.409688			
3-Methylpentane	0	0			
Neohexane	0	0			
2,3-Dimethylbutane	0	0			
Methylcyclohexane	0	0			
Isooctane	0.0368308	0.0368308			
Decane, 2-Methyl-	0	0			
Toluene	0.0362433	0.0362433			
m-Xylene	0.0203631	0.0203631			
Ethylbenzene	0.00180501	0.00180501			

Volumetric Flow	Total ft^3/h	Vapor ft^3/h			
Nitrogen	0.651936	0.651936			
Methane	194.298	194.298			
CO2	3.93022	3.93022			
Ethane	82.5458	82.5458			
Propane	47.8212	47.8212			
Isobutane	7.56396	7.56396			
n-Butane	16.794	16.794			
Isopentane	4.23746	4.23746			
n-Pentane	3.99859	3.99859			
n-Hexane	1.09725	1.09725			
Methylcyclopentane	0	0			
Benzene	0.078535	0.078535			
Cyclohexane	0.0916714	0.0916714			
n-Heptane	1.13062	1.13062			
n-Octane	0.294591	0.294591			
n-Nonane	0.0689213	0.0689213			
n-Decane	0.0595065	0.0595065			
n-Undecane	0	0			
Dodecane	0	0			
Water	5.62056	5.62056			
Triethylene Glycol	0	0			
Oxygen	0	0			
Argon	0	0			
Carbon Monoxide	0	0			
Cyclopentane	0	0			
Isohexane	1.70638	1.70638			
3-Methylpentane	0	0			
Neohexane	0	0			
2,3-Dimethylbutane	0	0			
Methylcyclohexane	0	0			
Isooctane	0.114735	0.114735			
Decane, 2-Methyl-	0	0			
Toluene	0.140752	0.140752			
m-Xylene	0.0681959	0.0681959			
Ethylbenzene	0.00604891	0.00604891			

Properties

Property	Units	Total	Vapor			
Temperature	°F	69.8033	69.8033			
Pressure	psig	0.625	0.625			

Process Streams Report
Stream: Combined Flash Vapor
Phases Grouped by Columns

Client Name:	EQT Production	Job: V1.0
Location:	OXF 160 Wellpad	Modified: 11:44 AM, 10/30/2015
Flowsheet:	OXF-160	Status: Solved 12:48 PM, 10/12/2016

Properties

Property	Units	Total	Vapor			
Mole Fraction Vapor		1	1			
Mole Fraction Light Liquid		0	0			
Mole Fraction Heavy Liquid		0	0			
Molecular Weight	lb/lbmol	28.2345	28.2345			
Mass Density	lb/ft^3	0.0766308	0.0766308			
Molar Flow	lbmol/h	1.0105	1.0105			
Mass Flow	lb/h	28.5311	28.5311			
Vapor Volumetric Flow	ft^3/h	372.319	372.319			
Liquid Volumetric Flow	gpm	46.4189	46.4189			
Std Vapor Volumetric Flow	MMSCFD	0.00920328	0.00920328			
Specific Gravity		0.974861	0.974861			
API Gravity						
Enthalpy	Btu/h	-40449.5	-40449.5			
Net Ideal Gas Heating Value	Btu/ft^3	1477.89	1477.89			
Net Liquid Heating Value	Btu/lb	19746.1	19746.1			
Std Liquid Volumetric Flow	sgpm	0.140916	0.140916			

Remarks

Process Streams Report
Stream: Pipeline
Phases Grouped by Columns

Client Name:	EQT Production	Job: V1.0
Location:	OXF 160 Wellpad	Modified: 12:56 PM, 4/7/2015
Flowsheet:	OXF-160	Status: Solved 12:48 PM, 10/12/2016

Connections

From:	To:
MIX-101	--

Composition

Mole Fraction	Total	Vapor			
Nitrogen	0.00527783	0.00527783			
Methane	0.785533	0.785533			
CO2	0.00193151	0.00193151			
Ethane	0.138215	0.138215			
Propane	0.0425334	0.0425334			
Isobutane	0.00518606	0.00518606			
n-Butane	0.0104	0.0104			
Isopentane	0.00258298	0.00258298			
n-Pentane	0.00251478	0.00251478			
n-Hexane	0.000779996	0.000779996			
Methylcyclopentane	0	0			
Benzene	2.5474E-05	2.5474E-05			
Cyclohexane	5.34363E-05	5.34363E-05			
n-Heptane	0.000975612	0.000975612			
n-Octane	0.000312617	0.000312617			
n-Nonane	8.96602E-05	8.96602E-05			
n-Decane	9.72059E-05	9.72059E-05			
n-Undecane	0	0			
Dodecane	0	0			
Water	0.00216388	0.00216388			
Triethylene Glycol	0	0			
Oxygen	0	0			
Argon	0	0			
Carbon Monoxide	0	0			
Cyclopentane	0	0			
Isohexane	0.00113983	0.00113983			
3-Methylpentane	0	0			
Neohexane	0	0			
2,3-Dimethylbutane	0	0			
Methylcyclohexane	0	0			
Isooctane	9.72047E-05	9.72047E-05			
Decane, 2-Methyl-	0	0			
Toluene	5.50538E-05	5.50538E-05			
m-Xylene	3.29019E-05	3.29019E-05			
Ethylbenzene	2.92552E-06	2.92552E-06			

Mass Flow	Total lb/h	Vapor lb/h			
Nitrogen	151.122	151.122			
Methane	12880.7	12880.7			
CO2	86.8858	86.8858			
Ethane	4247.97	4247.97			
Propane	1917.04	1917.04			
Isobutane	308.096	308.096			
n-Butane	617.845	617.845			
Isopentane	190.483	190.483			
n-Pentane	185.454	185.454			
n-Hexane	68.7039	68.7039			
Methylcyclopentane	0	0			
Benzene	2.03385	2.03385			
Cyclohexane	4.59669	4.59669			
n-Heptane	99.9216	99.9216			
n-Octane	36.5	36.5			
n-Nonane	11.7539	11.7539			
n-Decane	14.1367	14.1367			
n-Undecane	0	0			

Process Streams Report
Stream: Pipeline
Phases Grouped by Columns

Client Name:	EQT Production	Job: V1.0	
Location:	OXF 160 Wellpad	Modified: 12:56 PM, 4/7/2015	
Flowsheet:	OXF-160	Status: Solved 12:48 PM, 10/12/2016	

Mass Flow	Total lb/h	Vapor lb/h			
Dodecane	0	0			
Water	39.8457	39.8457			
Triethylene Glycol	0	0			
Oxygen	0	0			
Argon	0	0			
Carbon Monoxide	0	0			
Cyclopentane	0	0			
Isohexane	100.399	100.399			
3-Methylpentane	0	0			
Neohexane	0	0			
2,3-Dimethylbutane	0	0			
Methylcyclohexane	0	0			
Isooctane	11.3493	11.3493			
Decane, 2-Methyl-	0	0			
Toluene	5.18483	5.18483			
m-Xylene	3.57033	3.57033			
Ethylbenzene	0.317461	0.317461			

Volumetric Flow	Total ft^3/h	Vapor ft^3/h			
Nitrogen	80.8223	80.8223			
Methane	11185.2	11185.2			
CO2	25.7741	25.7741			
Ethane	1680.81	1680.81			
Propane	447.775	447.775			
Isobutane	48.1717	48.1717			
n-Butane	91.7302	91.7302			
Isopentane	19.4598	19.4598			
n-Pentane	18.28	18.28			
n-Hexane	4.39315	4.39315			
Methylcyclopentane	0	0			
Benzene	0.170652	0.170652			
Cyclohexane	0.322866	0.322866			
n-Heptane	3.92384	3.92384			
n-Octane	0.81213	0.81213			
n-Nonane	0.0802962	0.0802962			
n-Decane	-0.0690641	-0.0690641			
n-Undecane	0	0			
Dodecane	0	0			
Water	29.7885	29.7885			
Triethylene Glycol	0	0			
Oxygen	0	0			
Argon	0	0			
Carbon Monoxide	0	0			
Cyclopentane	0	0			
Isohexane	6.89385	6.89385			
3-Methylpentane	0	0			
Neohexane	0	0			
2,3-Dimethylbutane	0	0			
Methylcyclohexane	0	0			
Isooctane	0.388713	0.388713			
Decane, 2-Methyl-	0	0			
Toluene	0.273411	0.273411			
m-Xylene	0.117096	0.117096			
Ethylbenzene	0.0108359	0.0108359			

Properties

Property	Units	Total	Vapor			
Temperature	°F	97.9829	97.9829			
Pressure	psig	400	400			

* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
Stream: Pipeline
Phases Grouped by Columns

Client Name:	EQT Production	Job: V1.0	
Location:	OXF 160 Wellpad	Modified: 12:56 PM, 4/7/2015	
Flowsheet:	OXF-160	Status: Solved 12:48 PM, 10/12/2016	

Properties

Property	Units	Total	Vapor			
Mole Fraction Vapor		1	1			
Mole Fraction Light Liquid		0	0			
Mole Fraction Heavy Liquid		0	0			
Molecular Weight	lb/lbmol	20.5296	20.5296			
Mass Density	lb/ft^3	1.53784	1.53784			
Molar Flow	lbmol/h	1022.13	1022.13			
Mass Flow	lb/h	20984	20984			
Vapor Volumetric Flow	ft^3/h	13645.1	13645.1			
Liquid Volumetric Flow	gpm	1701.21	1701.21			
Std Vapor Volumetric Flow	MMSCFD	9.30916	9.30916			
Specific Gravity		0.708833	0.708833			
API Gravity						
Enthalpy	Btu/h	-3.49713E+07	-3.49713E+07			
Net Ideal Gas Heating Value	Btu/ft^3	1120.15	1120.15			
Net Liquid Heating Value	Btu/lb	20645.7	20645.7			
Std Liquid Volumetric Flow	sgpm	123.381	123.381			

Remarks

Process Streams Report
Stream: Reservoir Gas
Phases Grouped by Columns

Client Name:	EQT Production	Job: V1.0	
Location:	OXF 160 Wellpad	Modified: 12:38 PM, 10/12/2016	
Flowsheet:	OXF-160	Status: Solved 12:48 PM, 10/12/2016	

Connections

From: --	To: MIX-102

Composition

Mole Fraction	Total	Vapor	Light Liquid		
Nitrogen	0.00532 *	0.00532172	0.000514159		
Methane	0.78965 *	0.789862	0.198848		
CO2	0.00195 *	0.00195032	0.00106852		
Ethane	0.1378 *	0.137797	0.146835		
Propane	0.04195 *	0.041921	0.122817		
Isobutane	0.00507 *	0.0050607	0.0310149		
n-Butane	0.01013 *	0.0101035	0.0840527		
Isopentane	0.00249 *	0.00247593	0.0417153		
n-Pentane	0.00239 *	0.00237305	0.0496599		
n-Hexane	0.00073 *	0.000715426	0.0413684		
Methylcyclopentane	0 *	0	0		
Benzene	2E-05 *	1.96029E-05	0.00112737		
Cyclohexane	0.00011 *	0.000107443	0.00723965		
n-Heptane	0.00079 *	0.000753337	0.103018		
n-Octane	3E-05 *	2.67433E-05	0.00911076		
n-Nonane	4E-05 *	3.02768E-05	0.0271517		
n-Decane	3E-05 *	1.73577E-05	0.0352812		
n-Undecane	0 *	0	0		
Dodecane	0 *	0	0		
Water	0 *	0	0		
Triethylene Glycol	0 *	0	0		
Oxygen	0 *	0	0		
Argon	0 *	0	0		
Carbon Monoxide	0 *	0	0		
Cyclopentane	0 *	0	0		
Isohexane	0.00113 *	0.00111304	0.0484257		
3-Methylpentane	0 *	0	0		
Neohexane	0 *	0	0		
2,3-Dimethylbutane	0 *	0	0		
Methylcyclohexane	0 *	0	0		
Isooctane	0.00031 *	0.000296469	0.0380405		
Decane, 2-Methyl-	0 *	0	0		
Toluene	4E-05 *	3.79848E-05	0.00565914		
m-Xylene	2E-05 *	1.7478E-05	0.00705233		
Ethylbenzene	0 *	0	0		

Mass Flow	Total lb/h	Vapor lb/h	Light Liquid lb/h		
Nitrogen	151.172 *	151.167	0.00523785		
Methane	12849.9 *	12848.7	1.16006		
CO2	87.0512 *	87.0341	0.0171009		
Ethane	4203.03 *	4201.43	1.6056		
Propane	1876.38 *	1874.41	1.96944		
Isobutane	298.912 *	298.257	0.655544		
n-Butane	597.235 *	595.459	1.77657		
Isopentane	182.231 *	181.137	1.0945		
n-Pentane	174.913 *	173.61	1.30294		
n-Hexane	63.8116 *	62.5152	1.29641		
Methylcyclopentane	0 *	0	0		
Benzene	1.58468 *	1.55265	0.0320237		
Cyclohexane	9.39052 *	9.16895	0.22157		
n-Heptane	80.2966 *	76.5427	3.75388		
n-Octane	3.47608 *	3.09762	0.378459		
n-Nonane	5.2039 *	3.93752	1.26637		
n-Decane	4.32976 *	2.50426	1.8255		
n-Undecane	0 *	0	0		

Process Streams Report
Stream: Reservoir Gas
Phases Grouped by Columns

Client Name:	EQT Production	Job: V1.0	
Location:	OXF 160 Wellpad	Modified: 12:38 PM, 10/12/2016	
Flowsheet:	OXF-160	Status: Solved 12:48 PM, 10/12/2016	

Mass Flow	Total lb/h	Vapor lb/h	Light Liquid lb/h		
Dodecane	0 *	0	0		
Water	0 *	0	0		
Triethylene Glycol	0 *	0	0		
Oxygen	0 *	0	0		
Argon	0 *	0	0		
Carbon Monoxide	0 *	0	0		
Cyclopentane	0 *	0	0		
Isohexane	98.7769 *	97.2594	1.51757		
3-Methylpentane	0 *	0	0		
Neohexane	0 *	0	0		
2,3-Dimethylbutane	0 *	0	0		
Methylcyclohexane	0 *	0	0		
Isooctane	35.9195 *	34.3393	1.58019		
Decane, 2-Methyl-	0 *	0	0		
Toluene	3.73848 *	3.54886	0.189618		
m-Xylene	2.1538 *	1.88153	0.272272		
Ethylbenzene	0 *	0	0		

Volumetric Flow	Total ft^3/h	Vapor ft^3/h	Light Liquid gpm		
Nitrogen	47.2569	47.2567	2.44102E-05		
Methane	6011.26	6011.18	0.00904997		
CO2	12.7251	12.7248	3.24079E-05		
Ethane	713.312	713.25	0.00762021		
Propane	138.199	138.137	0.00772532		
Isobutane	9.53992	9.52126	0.00232624		
n-Butane	13.4371	13.3883	0.00608265		
Isopentane	-0.329696	-0.357349	0.00344763		
n-Pentane	-1.04684	-1.07945	0.00406489		
n-Hexane	-1.64272	-1.67308	0.00378543		
Methylcyclopentane	0	0	0		
Benzene	-0.0221441	-0.022681	6.69331E-05		
Cyclohexane	-0.199771	-0.204026	0.000530509		
n-Heptane	-3.06402	-3.1481	0.010482		
n-Octane	-0.146923	-0.155051	0.00101333		
n-Nonane	-0.208329	-0.234678	0.00328512		
n-Decane	-0.129152	-0.166349	0.00463764		
n-Undecane	0	0	0		
Dodecane	0	0	0		
Water	0	0	0		
Triethylene Glycol	0	0	0		
Oxygen	0	0	0		
Argon	0	0	0		
Carbon Monoxide	0	0	0		
Cyclopentane	0	0	0		
Isohexane	-2.01282	-2.04882	0.00448829		
3-Methylpentane	0	0	0		
Neohexane	0	0	0		
2,3-Dimethylbutane	0	0	0		
Methylcyclohexane	0	0	0		
Isooctane	-1.19629	-1.23079	0.00430227		
Decane, 2-Methyl-	0	0	0		
Toluene	-0.116375	-0.119548	0.000395494		
m-Xylene	-0.0783298	-0.0828702	0.000566082		
Ethylbenzene	0	0	0		

Properties

Property	Units	Total	Vapor	Light Liquid		
Temperature	°F	75 *	75	75		
Pressure	psig	700 *	700	700		

* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
Stream: Reservoir Gas
Phases Grouped by Columns

Client Name:	EQT Production	Job: V1.0	
Location:	OXF 160 Wellpad	Modified: 12:38 PM, 10/12/2016	
Flowsheet:	OXF-160	Status: Solved 12:48 PM, 10/12/2016	

Properties

Property	Units	Total	Vapor	Light Liquid		
Mole Fraction Vapor		0.999641	1	0		
Mole Fraction Light Liquid		0.000358505	0	1		
Mole Fraction Heavy Liquid		0	0	0		
Molecular Weight	lb/lbmol	20.436	20.4217	60.2793		
Mass Density	lb/ft^3	2.98888	2.98598	36.9689		
Molar Flow	lbmol/h	1014.36	1014	0.363655		
Mass Flow	lb/h	20729.5	20707.6	21.9209		
Vapor Volumetric Flow	ft^3/h	6935.53	6934.94	0.592954		
Liquid Volumetric Flow	gpm	864.69	864.616	0.0739268		
Std Vapor Volumetric Flow	MMSCFD	9.23844	9.23513	0.00331203		
Specific Gravity			0.705105	0.592744		
API Gravity				103.274		
Enthalpy	Btu/h	-3.50225E+07	-3.4999E+07	-23554.7		
Net Ideal Gas Heating Value	Btu/ft^3	1117.56	1116.84	3103.87		
Net Liquid Heating Value	Btu/lb	20695.2	20696.6	19391.9		
Std Liquid Volumetric Flow	sgpm	122.38 *	122.304	0.0757943		

Remarks

Process Streams Report
Stream: Reservoir Oil
Phases Grouped by Columns

Client Name:	EQT Production	Job: V1.0	
Location:	OXF 160 Wellpad	Modified: 12:47 PM, 10/12/2016	
Flowsheet:	OXF-160	Status: Solved 3:30 PM, 10/10/2016	

Connections

From: --	To: MIX-102

Composition

Mole Fraction	Total	Light Liquid			
Nitrogen	0 *	0			
Methane	0.11209 *	0.11209			
CO2	0.00077 *	0.00077			
Ethane	0.08553 *	0.08553			
Propane	0.07326 *	0.07326			
Isobutane	0.0192 *	0.0192			
n-Butane	0.05327 *	0.05327			
Isopentane	0.03053 *	0.03053			
n-Pentane	0.03803 *	0.03803			
n-Hexane	0.0342 *	0.0342			
Methylcyclopentane	0 *	0			
Benzene	0.00136 *	0.00136			
Cyclohexane	0 *	0			
n-Heptane	0.11451 *	0.11451			
n-Octane	0.10496 *	0.10496			
n-Nonane	0.07432 *	0.07432			
n-Decane	0.20232 *	0.20232			
n-Undecane	0 *	0			
Dodecane	0 *	0			
Water	0 *	0			
Triethylene Glycol	0 *	0			
Oxygen	0 *	0			
Argon	0 *	0			
Carbon Monoxide	0 *	0			
Cyclopentane	0 *	0			
Isohexane	0.03444 *	0.03444			
3-Methylpentane	0 *	0			
Neohexane	0 *	0			
2,3-Dimethylbutane	0 *	0			
Methylcyclohexane	0 *	0			
Isooctane	0.00024 *	0.00024			
Decane, 2-Methyl-	0 *	0			
Toluene	0.00727 *	0.00727			
m-Xylene	0.01258 *	0.01258			
Ethylbenzene	0.00112 *	0.00112			

Mass Flow	Total lb/h	Light Liquid lb/h			
Nitrogen	0 *	0			
Methane	39.8419 *	39.8419			
CO2	0.750826 *	0.750826			
Ethane	56.9824 *	56.9824			
Propane	71.5756 *	71.5756			
Isobutane	24.7255 *	24.7255			
n-Butane	68.6005 *	68.6005			
Isopentane	48.8043 *	48.8043			
n-Pentane	60.7936 *	60.7936			
n-Hexane	65.2998 *	65.2998			
Methylcyclopentane	0 *	0			
Benzene	2.35374 *	2.35374			
Cyclohexane	0 *	0			
n-Heptane	254.227 *	254.227			
n-Octane	265.644 *	265.644			
n-Nonane	211.195 *	211.195			
n-Decane	637.808 *	637.808			
n-Undecane	0 *	0			

Process Streams Report
Stream: Reservoir Oil
Phases Grouped by Columns

Client Name:	EQT Production	Job: V1.0	
Location:	OXF 160 Wellpad	Modified: 12:47 PM, 10/12/2016	
Flowsheet:	OXF-160	Status: Solved 3:30 PM, 10/10/2016	

Mass Flow	Total lb/h		Light Liquid lb/h
Dodecane	0	*	0
Water	0	*	0
Triethylene Glycol	0	*	0
Oxygen	0	*	0
Argon	0	*	0
Carbon Monoxide	0	*	0
Cyclopentane	0	*	0
Isohexane	65.758	*	65.758
3-Methylpentane	0	*	0
Neohexane	0	*	0
2,3-Dimethylbutane	0	*	0
Methylcyclohexane	0	*	0
Isooctane	0.607419	*	0.607419
Decane, 2-Methyl-	0	*	0
Toluene	14.8415	*	14.8415
m-Xylene	29.5913	*	29.5913
Ethylbenzene	2.63452	*	2.63452

Volumetric Flow	Total gpm	Light Liquid gpm
Nitrogen	0	0
Methane	0.255447	0.255447
CO2	0.00111086	0.00111086
Ethane	0.245055	0.245055
Propane	0.268708	0.268708
Isobutane	0.0865813	0.0865813
n-Butane	0.233193	0.233193
Isopentane	0.155728	0.155728
n-Pentane	0.192582	0.192582
n-Hexane	0.196285	0.196285
Methylcyclopentane	0	0
Benzene	0.00523079	0.00523079
Cyclohexane	0	0
n-Heptane	0.737824	0.737824
n-Octane	0.744026	0.744026
n-Nonane	0.575604	0.575604
n-Decane	1.70697	1.70697
n-Undecane	0	0
Dodecane	0	0
Water	0	0
Triethylene Glycol	0	0
Oxygen	0	0
Argon	0	0
Carbon Monoxide	0	0
Cyclopentane	0	0
Isohexane	0.199703	0.199703
3-Methylpentane	0	0
Neohexane	0	0
2,3-Dimethylbutane	0	0
Methylcyclohexane	0	0
Isooctane	0.0017227	0.0017227
Decane, 2-Methyl-	0	0
Toluene	0.0332788	0.0332788
m-Xylene	0.0664651	0.0664651
Ethylbenzene	0.00590066	0.00590066

Properties

Property	Units	Total		Light Liquid
Temperature	°F	75	*	75
Pressure	psig	700	*	700

* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
Stream: Reservoir Oil
Phases Grouped by Columns

Client Name:	EQT Production	Job: V1.0	
Location:	OXF 160 Wellpad	Modified: 12:47 PM, 10/12/2016	
Flowsheet:	OXF-160	Status: Solved 3:30 PM, 10/10/2016	

Properties

Property	Units	Total	Light Liquid			
Mole Fraction Vapor		0	0			
Mole Fraction Light Liquid		1	1			
Mole Fraction Heavy Liquid		0	0			
Molecular Weight	lb/lbmol	86.7479	86.7479			
Mass Density	lb/ft^3	41.9564	41.9564			
Molar Flow	lbmol/h	22.1566	22.1566			
Mass Flow	lb/h	1922.04	1922.04			
Vapor Volumetric Flow	ft^3/h	45.8103	45.8103			
Liquid Volumetric Flow	gpm	5.71142	5.71142			
Std Vapor Volumetric Flow	MMSCFD	0.201793	0.201793			
Specific Gravity		0.672712	0.672712			
API Gravity		76.4041	76.4041			
Enthalpy	Btu/h	-1.86742E+06	-1.86742E+06			
Net Ideal Gas Heating Value	Btu/ft^3	4418.75	4418.75			
Net Liquid Heating Value	Btu/lb	19174.9	19174.9			
Std Liquid Volumetric Flow	sgpm	5.8625 *	5.8625			

Remarks

Process Streams Report
Stream: Reservoir Water
Phases Grouped by Columns

Client Name:	EQT Production	Job: V1.0	
Location:	OXF 160 Wellpad	Modified: 12:40 PM, 10/12/2016	
Flowsheet:	OXF-160	Status: Solved 12:45 PM, 10/12/2016	

Connections

From: --	To: MIX-102

Composition

Mole Fraction	Total	Light Liquid			
Nitrogen	0 *	0			
Methane	0 *	0			
CO2	0 *	0			
Ethane	0 *	0			
Propane	0 *	0			
Isobutane	0 *	0			
n-Butane	0 *	0			
Isopentane	0 *	0			
n-Pentane	0 *	0			
n-Hexane	0 *	0			
Methylcyclopentane	0 *	0			
Benzene	0 *	0			
Cyclohexane	0 *	0			
n-Heptane	0 *	0			
n-Octane	0 *	0			
n-Nonane	0 *	0			
n-Decane	0 *	0			
n-Undecane	0 *	0			
Dodecane	0 *	0			
Water	1 *	1			
Triethylene Glycol	0 *	0			
Oxygen	0 *	0			
Argon	0 *	0			
Carbon Monoxide	0 *	0			
Cyclopentane	0 *	0			
Isohexane	0 *	0			
3-Methylpentane	0 *	0			
Neohexane	0 *	0			
2,3-Dimethylbutane	0 *	0			
Methylcyclohexane	0 *	0			
Isooctane	0 *	0			
Decane, 2-Methyl-	0 *	0			
Toluene	0 *	0			
m-Xylene	0 *	0			
Ethylbenzene	0 *	0			

Mass Flow	Total lb/h	Light Liquid lb/h			
Nitrogen	0 *	0			
Methane	0 *	0			
CO2	0 *	0			
Ethane	0 *	0			
Propane	0 *	0			
Isobutane	0 *	0			
n-Butane	0 *	0			
Isopentane	0 *	0			
n-Pentane	0 *	0			
n-Hexane	0 *	0			
Methylcyclopentane	0 *	0			
Benzene	0 *	0			
Cyclohexane	0 *	0			
n-Heptane	0 *	0			
n-Octane	0 *	0			
n-Nonane	0 *	0			
n-Decane	0 *	0			
n-Undecane	0 *	0			

Process Streams Report
Stream: Reservoir Water
Phases Grouped by Columns

Client Name:	EQT Production	Job: V1.0	
Location:	OXF 160 Wellpad	Modified: 12:40 PM, 10/12/2016	
Flowsheet:	OXF-160	Status: Solved 12:45 PM, 10/12/2016	

Mass Flow	Total lb/h		Light Liquid lb/h
Dodecane	0	*	0
Water	19427.8	*	19427.8
Triethylene Glycol	0	*	0
Oxygen	0	*	0
Argon	0	*	0
Carbon Monoxide	0	*	0
Cyclopentane	0	*	0
Isohexane	0	*	0
3-Methylpentane	0	*	0
Neohexane	0	*	0
2,3-Dimethylbutane	0	*	0
Methylcyclohexane	0	*	0
Isooctane	0	*	0
Decane, 2-Methyl-	0	*	0
Toluene	0	*	0
m-Xylene	0	*	0
Ethylbenzene	0	*	0

Volumetric Flow	Total gpm	Light Liquid gpm
Nitrogen	0	0
Methane	0	0
CO2	0	0
Ethane	0	0
Propane	0	0
Isobutane	0	0
n-Butane	0	0
Isopentane	0	0
n-Pentane	0	0
n-Hexane	0	0
Methylcyclopentane	0	0
Benzene	0	0
Cyclohexane	0	0
n-Heptane	0	0
n-Octane	0	0
n-Nonane	0	0
n-Decane	0	0
n-Undecane	0	0
Dodecane	0	0
Water	38.8964	38.8964
Triethylene Glycol	0	0
Oxygen	0	0
Argon	0	0
Carbon Monoxide	0	0
Cyclopentane	0	0
Isohexane	0	0
3-Methylpentane	0	0
Neohexane	0	0
2,3-Dimethylbutane	0	0
Methylcyclohexane	0	0
Isooctane	0	0
Decane, 2-Methyl-	0	0
Toluene	0	0
m-Xylene	0	0
Ethylbenzene	0	0

Properties

Property	Units	Total		Light Liquid
Temperature	°F	75	*	75
Pressure	psig	700	*	700

* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
Stream: Reservoir Water
Phases Grouped by Columns

Client Name:	EQT Production	Job: V1.0	
Location:	OXF 160 Wellpad	Modified: 12:40 PM, 10/12/2016	
Flowsheet:	OXF-160	Status: Solved 12:45 PM, 10/12/2016	

Properties

Property	Units	Total	Light Liquid			
Mole Fraction Vapor		0	0			
Mole Fraction Light Liquid		1	1			
Mole Fraction Heavy Liquid		0	0			
Molecular Weight	lb/lbmol	18.0153	18.0153			
Mass Density	lb/ft^3	62.2722	62.2722			
Molar Flow	lbmol/h	1078.41	1078.41			
Mass Flow	lb/h	19427.8	19427.8			
Vapor Volumetric Flow	ft^3/h	311.982	311.982			
Liquid Volumetric Flow	gpm	38.8964	38.8964			
Std Vapor Volumetric Flow	MMSCFD	9.82171	9.82171			
Specific Gravity		0.998448	0.998448			
API Gravity		9.91415	9.91415			
Enthalpy	Btu/h	-1.32476E+08	-1.32476E+08			
Net Ideal Gas Heating Value	Btu/ft^3	0	0			
Net Liquid Heating Value	Btu/lb	-1059.76	-1059.76			
Std Liquid Volumetric Flow	sgpm	38.8376 *	38.8376			

Remarks

Process Streams Report
Stream: Sales Oil
Phases Grouped by Columns

Client Name:	EQT Production	Job: V1.0	
Location:	OXF 160 Wellpad	Modified: 4:18 PM, 5/12/2015	
Flowsheet:	OXF-160	Status: Solved 12:48 PM, 10/12/2016	

Connections

From:	To:
Oil Tanks	--

Composition

Mole Fraction	Total	Light Liquid			
Nitrogen	2.49595E-07	2.49595E-07			
Methane	0.000930407	0.000930407			
CO2	2.58246E-05	2.58246E-05			
Ethane	0.0108952	0.0108952			
Propane	0.0365805	0.0365805			
Isobutane	0.0158386	0.0158386			
n-Butane	0.0500571	0.0500571			
Isopentane	0.0353519	0.0353519			
n-Pentane	0.044031	0.044031			
n-Hexane	0.0448337	0.0448337			
Methylcyclopentane	0	0			
Benzene	0.00150126	0.00150126			
Cyclohexane	0.00364223	0.00364223			
n-Heptane	0.150198	0.150198			
n-Octane	0.130766	0.130766			
n-Nonane	0.102487	0.102487			
n-Decane	0.283526	0.283526			
n-Undecane	0	0			
Dodecane	0	0			
Water	4.38205E-05	4.38205E-05			
Triethylene Glycol	0	0			
Oxygen	0	0			
Argon	0	0			
Carbon Monoxide	0	0			
Cyclopentane	0	0			
Isohexane	0.0475042	0.0475042			
3-Methylpentane	0	0			
Neohexane	0	0			
2,3-Dimethylbutane	0	0			
Methylcyclohexane	0	0			
Isooctane	0.0141385	0.0141385			
Decane, 2-Methyl-	0	0			
Toluene	0.00923718	0.00923718			
m-Xylene	0.0170124	0.0170124			
Ethylbenzene	0.00139807	0.00139807			

Mass Flow	Total lb/h	Light Liquid lb/h			
Nitrogen	0.000108844	0.000108844			
Methane	0.232351	0.232351			
CO2	0.0176922	0.0176922			
Ethane	5.09986	5.09986			
Propane	25.11	25.11			
Isobutane	14.3305	14.3305			
n-Butane	45.2907	45.2907			
Isopentane	39.7048	39.7048			
n-Pentane	49.4526	49.4526			
n-Hexane	60.1436	60.1436			
Methylcyclopentane	0	0			
Benzene	1.82546	1.82546			
Cyclohexane	4.77169	4.77169			
n-Heptane	234.284	234.284			
n-Octane	232.525	232.525			
n-Nonane	204.619	204.619			
n-Decane	627.977	627.977			
n-Undecane	0	0			

Process Streams Report
Stream: Sales Oil
Phases Grouped by Columns

Client Name:	EQT Production	Job: V1.0	
Location:	OXF 160 Wellpad	Modified: 4:18 PM, 5/12/2015	
Flowsheet:	OXF-160	Status: Solved 12:48 PM, 10/12/2016	

Mass Flow	Total lb/h	Light Liquid lb/h			
Dodecane	0	0			
Water	0.0122891	0.0122891			
Triethylene Glycol	0	0			
Oxygen	0	0			
Argon	0	0			
Carbon Monoxide	0	0			
Cyclopentane	0	0			
Isohexane	63.726	63.726			
3-Methylpentane	0	0			
Neohexane	0	0			
2,3-Dimethylbutane	0	0			
Methylcyclohexane	0	0			
Isooctane	25.1408	25.1408			
Decane, 2-Methyl-	0	0			
Toluene	13.249	13.249			
m-Xylene	28.1157	28.1157			
Ethylbenzene	2.31053	2.31053			

Volumetric Flow	Total gpm	Light Liquid gpm			
Nitrogen	3.37604E-07	3.37604E-07			
Methane	0.00131517	0.00131517			
CO2	2.00488E-05	2.00488E-05			
Ethane	0.0204348	0.0204348			
Propane	0.0909346	0.0909346			
Isobutane	0.0494202	0.0494202			
n-Butane	0.151568	0.151568			
Isopentane	0.126344	0.126344			
n-Pentane	0.156084	0.156084			
n-Hexane	0.181527	0.181527			
Methylcyclopentane	0	0			
Benzene	0.00405356	0.00405356			
Cyclohexane	0.0122092	0.0122092			
n-Heptane	0.686506	0.686506			
n-Octane	0.659896	0.659896			
n-Nonane	0.566559	0.566559			
n-Decane	1.71099	1.71099			
n-Undecane	0	0			
Dodecane	0	0			
Water	-1.8979E-05	-1.8979E-05			
Triethylene Glycol	0	0			
Oxygen	0	0			
Argon	0	0			
Carbon Monoxide	0	0			
Cyclopentane	0	0			
Isohexane	0.194463	0.194463			
3-Methylpentane	0	0			
Neohexane	0	0			
2,3-Dimethylbutane	0	0			
Methylcyclohexane	0	0			
Isooctane	0.0724671	0.0724671			
Decane, 2-Methyl-	0	0			
Toluene	0.029983	0.029983			
m-Xylene	0.0640642	0.0640642			
Ethylbenzene	0.00525841	0.00525841			

Properties

Property	Units	Total	Light Liquid			
Temperature	°F	70 *	70			
Pressure	psig	0.625	0.625			

* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
Stream: Sales Oil
Phases Grouped by Columns

Client Name:	EQT Production	Job: V1.0	
Location:	OXF 160 Wellpad	Modified: 4:18 PM, 5/12/2015	
Flowsheet:	OXF-160	Status: Solved 12:48 PM, 10/12/2016	

Properties

Property	Units	Total	Light Liquid			
Mole Fraction Vapor		0	0			
Mole Fraction Light Liquid		1	1			
Mole Fraction Heavy Liquid		0	0			
Molecular Weight	lb/lbmol	107.789	107.789			
Mass Density	lb/ft^3	43.7279	43.7279			
Molar Flow	lbmol/h	15.5669	15.5669			
Mass Flow	lb/h	1677.94	1677.94			
Vapor Volumetric Flow	ft^3/h	38.3723	38.3723			
Liquid Volumetric Flow	gpm	4.78408	4.78408			
Std Vapor Volumetric Flow	MMSCFD	0.141777	0.141777			
Specific Gravity		0.701116	0.701116			
API Gravity		68.9669	68.9669			
Enthalpy	Btu/h	-1.56059E+06	-1.56059E+06			
Net Ideal Gas Heating Value	Btu/ft^3	5462.64	5462.64			
Net Liquid Heating Value	Btu/lb	19073.6	19073.6			
Std Liquid Volumetric Flow	sgpm	4.79603	4.79603			

Remarks

Process Streams Report
Stream: Water Out
Phases Grouped by Columns

Client Name:	EQT Production	Job: V1.0	
Location:	OXF 160 Wellpad	Modified: 3:19 PM, 4/7/2015	
Flowsheet:	OXF-160	Status: Solved 12:48 PM, 10/12/2016	

Connections

From:	To:
Water Tanks	--

Composition

Mole Fraction	Total	Light Liquid			
Nitrogen	3.66151E-08	3.66151E-08			
Methane	1.99482E-05	1.99482E-05			
CO2	9.0875E-06	9.0875E-06			
Ethane	6.1571E-06	6.1571E-06			
Propane	7.78448E-07	7.78448E-07			
Isobutane	4.36306E-08	4.36306E-08			
n-Butane	1.84633E-07	1.84633E-07			
Isopentane	1.64453E-08	1.64453E-08			
n-Pentane	3.24102E-09	3.24102E-09			
n-Hexane	6.56357E-10	6.56357E-10			
Methylcyclopentane	0	0			
Benzene	7.38367E-07	7.38367E-07			
Cyclohexane	7.37313E-09	7.37313E-09			
n-Heptane	3.36089E-10	3.36089E-10			
n-Octane	1.18753E-11	1.18753E-11			
n-Nonane	2.75606E-12	2.75606E-12			
n-Decane	2.38121E-13	2.38121E-13			
n-Undecane	0	0			
Dodecane	0	0			
Water	0.999962	0.999962			
Triethylene Glycol	0	0			
Oxygen	0	0			
Argon	0	0			
Carbon Monoxide	0	0			
Cyclopentane	0	0			
Isohexane	1.59392E-09	1.59392E-09			
3-Methylpentane	0	0			
Neohexane	0	0			
2,3-Dimethylbutane	0	0			
Methylcyclohexane	0	0			
Isooctane	4.29828E-11	4.29828E-11			
Decane, 2-Methyl-	0	0			
Toluene	1.10866E-06	1.10866E-06			
m-Xylene	3.38973E-07	3.38973E-07			
Ethylbenzene	4.13532E-08	4.13532E-08			

Mass Flow	Total lb/h	Light Liquid lb/h			
Nitrogen	0.00110389	0.00110389			
Methane	0.34441	0.34441			
CO2	0.43042	0.43042			
Ethane	0.199249	0.199249			
Propane	0.0369425	0.0369425			
Isobutane	0.00272919	0.00272919			
n-Butane	0.0115492	0.0115492			
Isopentane	0.00127695	0.00127695			
n-Pentane	0.000251658	0.000251658			
n-Hexane	6.0873E-05	6.0873E-05			
Methylcyclopentane	0	0			
Benzene	0.0620712	0.0620712			
Cyclohexane	0.000667815	0.000667815			
n-Heptane	3.62436E-05	3.62436E-05			
n-Octane	1.45989E-06	1.45989E-06			
n-Nonane	3.80421E-07	3.80421E-07			
n-Decane	3.64626E-08	3.64626E-08			
n-Undecane	0	0			

Process Streams Report
Stream: Water Out
Phases Grouped by Columns

Client Name:	EQT Production	Job: V1.0	
Location:	OXF 160 Wellpad	Modified: 3:19 PM, 4/7/2015	
Flowsheet:	OXF-160	Status: Solved 12:48 PM, 10/12/2016	

Mass Flow	Total lb/h	Light Liquid lb/h			
Dodecane	0	0			
Water	19387.7	19387.7			
Triethylene Glycol	0	0			
Oxygen	0	0			
Argon	0	0			
Carbon Monoxide	0	0			
Cyclopentane	0	0			
Isohexane	0.000147826	0.000147826			
3-Methylpentane	0	0			
Neohexane	0	0			
2,3-Dimethylbutane	0	0			
Methylcyclohexane	0	0			
Isooctane	5.28409E-06	5.28409E-06			
Decane, 2-Methyl-	0	0			
Toluene	0.109937	0.109937			
m-Xylene	0.03873	0.03873			
Ethylbenzene	0.00472489	0.00472489			

Volumetric Flow	Total gpm	Light Liquid gpm			
Nitrogen	2.94817E-06	2.94817E-06			
Methane	0.00168319	0.00168319			
CO2	0.000673236	0.000673236			
Ethane	0.000666006	0.000666006			
Propane	0.000105654	0.000105654			
Isobutane	7.13762E-06	7.13762E-06			
n-Butane	2.98256E-05	2.98256E-05			
Isopentane	3.07026E-06	3.07026E-06			
n-Pentane	6.06257E-07	6.06257E-07			
n-Hexane	1.39386E-07	1.39386E-07			
Methylcyclopentane	0	0			
Benzene	0.000115751	0.000115751			
Cyclohexane	1.34909E-06	1.34909E-06			
n-Heptane	8.02909E-08	8.02909E-08			
n-Octane	3.13218E-09	3.13218E-09			
n-Nonane	7.96872E-10	7.96872E-10			
n-Decane	7.51687E-11	7.51687E-11			
n-Undecane	0	0			
Dodecane	0	0			
Water	38.8101	38.8101			
Triethylene Glycol	0	0			
Oxygen	0	0			
Argon	0	0			
Carbon Monoxide	0	0			
Cyclopentane	0	0			
Isohexane	3.38975E-07	3.38975E-07			
3-Methylpentane	0	0			
Neohexane	0	0			
2,3-Dimethylbutane	0	0			
Methylcyclohexane	0	0			
Isooctane	1.12203E-08	1.12203E-08			
Decane, 2-Methyl-	0	0			
Toluene	0.000202942	0.000202942			
m-Xylene	7.0916E-05	7.0916E-05			
Ethylbenzene	8.60545E-06	8.60545E-06			

Properties

Property	Units	Total	Light Liquid			
Temperature	°F	70	70			
Pressure	psig	0.625	0.625			

* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
Stream: Water Out
Phases Grouped by Columns

Client Name:	EQT Production	Job: V1.0	
Location:	OXF 160 Wellpad	Modified: 3:19 PM, 4/7/2015	
Flowsheet:	OXF-160	Status: Solved 12:48 PM, 10/12/2016	

Properties

Property	Units	Total	Light Liquid			
Mole Fraction Vapor		0	0			
Mole Fraction Light Liquid		1	1			
Mole Fraction Heavy Liquid		0	0			
Molecular Weight	lb/lbmol	18.0157	18.0157			
Mass Density	lb/ft^3	62.28	62.28			
Molar Flow	lbmol/h	1076.22	1076.22			
Mass Flow	lb/h	19388.9	19388.9			
Vapor Volumetric Flow	ft^3/h	311.318	311.318			
Liquid Volumetric Flow	gpm	38.8137	38.8137			
Std Vapor Volumetric Flow	MMSCFD	9.8018	9.8018			
Specific Gravity		0.998573	0.998573			
API Gravity		10.0027	10.0027			
Enthalpy	Btu/h	-1.32342E+08	-1.32342E+08			
Net Ideal Gas Heating Value	Btu/ft^3	0.0399889	0.0399889			
Net Liquid Heating Value	Btu/lb	-1058.85	-1058.85			
Std Liquid Volumetric Flow	sgpm	38.7625	38.7625			

Remarks

Environments Report

Client Name:	EQT Production	Job: V1.0
Location:	OXF 160 Wellpad	

Project-Wide Constants

Atmospheric Pressure	14.6959 psia	Ideal Gas Reference Pressure	14.6959 psia
Ideal Gas Reference Temperature	60 °F	Ideal Gas Reference Volume	379.484 ft^3/lbmol
Liquid Reference Temperature	60 °F		

Environment [Electrolytic NRTL-PR]

Environment Settings

Number of Poynting Intervals	0	Phase Tolerance	0.01
Gibbs Excess Model Evaluation Temperature	77 °F	Emulsion Enabled	False

Components

Component Name	Henry's Law Component	Phase Initiator	Component Name	Henry's Law Component	Phase Initiator
Nitrogen	True	False	2,3,5-Trimethylhexane	False	False
Methane	True	False	2,2-Dimethylheptane	False	False
CO2	True	False	2,4-Dimethylheptane	False	False
Ethane	True	False	2,2,3-Trimethylhexane	False	False
Propane	False	False	cis-1,2-Dimethylcyclohexane	False	False
Isobutane	False	False	2,6-Dimethylheptane	False	False
n-Butane	False	False	n-Propylcyclopentane	False	False
Isopentane	False	False	Cis,cis-1,3,5-Trimethylcyclohexane	False	False
n-Pentane	False	False	2,5-Dimethylheptane	False	False
Neohexane	False	False	3,5-Dimethylheptane	False	False
2,3-Dimethylbutane	False	False	Ethylcyclohexane	False	False
Cyclopentane	False	False	2,3,3-Trimethylhexane	False	False
Isohexane	False	False	3,3-Dimethylheptane	False	False
3-Methylpentane	False	False	1,1,4-Trimethylcyclohexane	False	False
n-Hexane	False	False	4,4-Dimethylheptane	False	False
2,2-Dimethylpentane	False	False	2-Methyl-4-Ethylhexane	False	False
Methylcyclopentane	False	False	2,3,4-Trimethylhexane	False	False
2,4-Dimethylpentane	False	False	Ethylbenzene	False	False
2,2,3-Trimethylbutane	False	False	2,3-Dimethylheptane	False	False
Benzene	False	False	Cis,trans-1,3,5-Trimethylcyclohexane	False	False
3,3-Dimethylpentane	False	False	3,3,4-Trimethylhexane	False	False
Cyclohexane	False	False	m-Xylene	False	False
2-Methylhexane	False	False	p-Xylene	False	False
2,3-Dimethylpentane	False	False	3,4-Dimethylheptane	False	False
1,1-Dimethylcyclopentane	False	False	2-Methyloctane	False	False
3-Methylhexane	False	False	4-Methyloctane	False	False
trans-1,3-Dimethylcyclopentane	False	False	3-Methyloctane	False	False
cis-1,3-Dimethylcyclopentane	False	False	Cis,trans-1,2,4-Trimethylcyclohexane	False	False
3-Ethylpentane	False	False	o-Xylene	False	False
trans-1,2-Dimethylcyclopentane	False	False	1,1,2-Trimethylcyclohexane	False	False
Isooctane	False	False	n-Nonane	False	False
n-Heptane	False	False	2,4-Dimethyloctane	False	False
Methylcyclohexane	False	False	Cyclohexane, 1-Ethyl-1-Methyl-	False	False
1,1,3-Trimethylcyclopentane	False	False	2,5-Dimethyloctane	False	False
2,2-Dimethylhexane	False	False	Isopropylbenzene	False	False
cis-1,2-Dimethylcyclopentane	False	False	2,2-Dimethyloctane	False	False
2,5-Dimethylhexane	False	False	Isopropylcyclohexane	False	False
2,4-Dimethylhexane	False	False	Cyclooctane	False	False
Ethylcyclopentane	False	False	2,6-Dimethyloctane	False	False
2,2,3-Trimethylpentane	False	False	n-Butylcyclopentane	False	False
Trans,cis-1,2,4-Trimethylcyclopentane	False	False	n-Propylcyclohexane	False	False
3,3-Dimethylhexane	False	False	3,3-Dimethyloctane	False	False
Trans,cis-1,2,3-Trimethylcyclopentane	False	False	3,5-Dimethyloctane	False	False
2,3,4-Trimethylpentane	False	False	2,7-Dimethyloctane	False	False
Toluene	False	False	n-Propylbenzene	False	False
2,3-Dimethylhexane	False	False	3,6-Dimethyloctane	False	False
1,1,2-Trimethylcyclopentane	False	False	m-Ethyltoluene	False	False
2,3,3-Trimethylpentane	False	False	p-Ethyltoluene	False	False

* User Specified Values
? Extrapolated or Approximate Values

Environments Report

Client Name:	EQT Production	Job: V1.0
Location:	OXF 160 Wellpad	

Components

Component Name	Henry's Law Component	Phase Initiator	Component Name	Henry's Law Component	Phase Initiator
2-Methyl-3-Ethylpentane	False	False	2,3-Dimethyloctane	False	False
2-Methylheptane	False	False	4-Methylnonane	False	False
4-Methylheptane	False	False	5-Methylnonane	False	False
3,4-Dimethylhexane	False	False	1,3,5-Trimethylbenzene	False	False
3-Methylheptane	False	False	2-Methylnonane	False	False
3-Ethylhexane	False	False	3-Ethyloctane	False	False
cis-1,3-Dimethylcyclohexane	False	False	1-Methyl-2-Ethylbenzene	False	False
Cis,trans-1,2,4-Trimethylcyclopentane	False	False	3-Methylnonane	False	False
trans-1,4-Dimethylcyclohexane	False	False	1,3-Diethylbenzene	False	False
2,2,5-Trimethylhexane	False	False	Isobutylbenzene	False	False
1,1-Dimethylcyclohexane	False	False	n-Decane	False	False
trans-1-Ethyl-3-Methylcyclopentane	False	False	1,2,4-Trimethylbenzene	False	False
cis-1-ethyl-3-methylcyclopentane	False	False	tert-Butylbenzene	False	False
trans-1-Ethyl-2-Methylcyclopentane	False	False	Isobutylcyclohexane	False	False
2,2,4-Trimethylhexane	False	False	n-Undecane	False	False
1-Ethyl-1-Methylcyclopentane	False	False	Water	False	True
Cycloheptane	False	False	Ethylene Glycol	False	True
n-Octane	False	False	Triethylene Glycol	False	True
trans-1,2-Dimethylcyclohexane	False	False	Carbon Monoxide	True	False
trans-1,3-Dimethylcyclohexane	False	False	NaOH	False	True
cis-1,4-Dimethylcyclohexane	False	False	HCl	True	True
Isopropylcyclopentane	False	False			

Electrolytic Reactions

Dissociation of HCl	ClH = H+ + Cl-
Dissociation of Sodium Hydroxide	HNaO = HO- + Na+
Dissociation of Water	H2O = H+ + HO-
First Dissociation of CO2	CO2 + H2O = (CHO3)- + H+
Second Dissociation of CO2	(CHO3)- = H+ + (CO3)2-

Physical Property Method Sets

Liquid Molar Volume	COSTALD	Overall Package	Electrolytic NRTL - PR
Stability Calculation	Peng-Robinson	Vapor Package	Peng-Robinson
Light Liquid Package	Electrolytic NRTL	Heavy Liquid Package	Electrolytic NRTL

Remarks

Environment [SRK Environment]

Environment Settings

Number of Poynting Intervals	0	Phase Tolerance	0.01
Gibbs Excess Model Evaluation Temperature	77 °F	Emulsion Enabled	False
Freeze Out Temperature Threshold Difference	10 °F		

Components

Component Name	Henry's Law Component	Phase Initiator	Component Name	Henry's Law Component	Phase Initiator
Nitrogen	False	False	Dodecane	False	False
Methane	False	False	Water	False	True
CO2	False	False	Triethylene Glycol	False	True
Ethane	False	False	Oxygen	False	False
Propane	False	False	Argon	False	False
Isobutane	False	False	Carbon Monoxide	False	False

Environments Report

Client Name:	EQT Production	Job: V1.0
Location:	OXF 160 Wellpad	

Components

Component Name	Henry's Law Component	Phase Initiator	Component Name	Henry's Law Component	Phase Initiator
n-Butane	False	False	Cyclopentane	False	False
Isopentane	False	False	Isohexane	False	False
n-Pentane	False	False	3-Methylpentane	False	False
n-Hexane	False	False	Neohexane	False	False
Methylcyclopentane	False	False	2,3-Dimethylbutane	False	False
Benzene	False	False	Methylcyclohexane	False	False
Cyclohexane	False	False	Isooctane	False	False
n-Heptane	False	False	Decane, 2-Methyl-	False	False
n-Octane	False	False	Toluene	False	False
n-Nonane	False	False	m-Xylene	False	False
n-Decane	False	False	Ethylbenzene	False	False
n-Undecane	False	False			

Physical Property Method Sets

Liquid Molar Volume	COSTALD	Overall Package	SRK
Stability Calculation	SRK	Vapor Package	SRK
Light Liquid Package	SRK	Heavy Liquid Package	SRK

Remarks

Calculator Report

Client Name:	EQT Production	Job: V1.0
Location:	OXF 160 Wellpad	

Heat Input Required

Source Code

CV1 = HV*FV

Calculated Variable [CV1]

Source Moniker	ProMax:ProMax!Project!Flowsheets!OXF-160!QStreams!Pilot Heat Input!Energy Rate
Value	566728
Unit	

Measured Variable [FV]

Source Moniker	ProMax:ProMax!Project!Flowsheets!OXF-160!PStreams!Combined Flash Vapor!Phases!Vapor!Properties!Std Vapor Volumetric Flow
Value	383.47
Unit	

Measured Variable [HV]

Source Moniker	ProMax:ProMax!Project!Flowsheets!OXF-160!PStreams!Combined Flash Vapor!Analyses!Combustion Analysis 1!Properties!Volumetric Net Ideal Gas Heating Value
Value	1477.89
Unit	

Remarks

Simple Solver 1

Source Code

Residual Error (for Condensate_Flowrate) = 1-Cond/164

Calculated Variable [Condensate_Flowrate]

Source Moniker	ProMax:ProMax!Project!Flowsheets!OXF-160!PStreams!Reservoir Gas!Phases!Total!Properties!Std Liquid Volumetric Flow
Value	4195.89
Unit	

Measured Variable [Cond]

Source Moniker	ProMax:ProMax!Project!Flowsheets!OXF-160!PStreams!Sales Oil!Phases!Total!Properties!Liquid Volumetric Flow
Value	164.025
Unit	

Solver Properties

Status: Solved

Error	-0.000155151		Iterations	13
Calculated Value	122.38	sgpm	Max Iterations	20
Lower Bound		sgpm	Weighting	1
Upper Bound		sgpm	Priority	0
Step Size		sgpm	Solver Active	Active
Is Minimizer	False		Group	
Algorithm	Default		Skip Dependency Check	False

Remarks

Simple Solver 2

Source Code

Residual Error (for Water_Flow_Rate) = 1-Water/1329

Calculator Report

Client Name:	EQT Production	Job: V1.0
Location:	OXF 160 Wellpad	

Calculated Variable [Water_Flow_Rate]

Source Moniker	ProMax:ProMax!Project!Flowsheets!OXF-160!PStreams!Reservoir Water!Phases!Total!Properties!Std Liquid Volumetric Flow
Value	1331.57
Unit	

Measured Variable [Water]

Source Moniker	ProMax:ProMax!Project!Flowsheets!OXF-160!PStreams!Water Out!Phases!Total!Properties!Std Liquid Volumetric Flow
Value	1329
Unit	

Solver Properties

Status: Solved

Error	-8.59451E-09		Iterations	13
Calculated Value	38.8376	sgpm	Max Iterations	20
Lower Bound		sgpm	Weighting	1
Upper Bound		sgpm	Priority	0
Step Size		sgpm	Solver Active	Active
Is Minimizer	False		Group	
Algorithm	Default		Skip Dependency Check	False

Remarks

Simple Specifier 1

Source Code

```
CV1 = O2Reqd * 3.0 / O2Frac
```

Calculated Variable [CV1]

Source Moniker	ProMax:ProMax!Project!Flowsheets!OXF-160!PStreams!Combustion Air!Phases!Total!Properties!Molar Flow
Value	46.476
Unit	

Measured Variable [O2Reqd]

Source Moniker	ProMax:ProMax!Project!Flowsheets!OXF-160!PStreams!Combined Flash Vapor!Analyses!Combustion Analysis 1!Properties!Required Combustion Oxygen
Value	3.24511
Unit	

Measured Variable [O2Frac]

Source Moniker	ProMax:ProMax!Project!Flowsheets!OXF-160!PStreams!Combustion Air!Phases!Total!Composition!Mole Fraction!Oxygen
Value	0.20947
Unit	

Remarks

Simple Specifier 3

Source Code

```
CV1 = Pin
```

Calculated Variable [CV1]

Source Moniker	ProMax:ProMax!Project!Flowsheets!OXF-160!PStreams!Compressed Gas to Sales!Phases!Total!Properties!Pressure
Value	400

Calculator Report

Client Name:	EQT Production	Job: V1.0
Location:	OXF 160 Wellpad	

Unit

Measured Variable [Pin]

Source Moniker	ProMax:ProMax!Project!Flowsheets!OXF-160!PStreams!Sales Gas!Phases!Total!Properties!Pressure
Value	400
Unit	

Remarks

User Value Sets Report

Client Name:	EQT Production	Job: V1.0
Location:	OXF 160 Wellpad	

Tank Losses.53

User Value [ShellLength]

* Parameter	20	ft	Upper Bound		ft
* Lower Bound	0	ft	* Enforce Bounds	False	

User Value [ShellDiam]

* Parameter	12	ft	Upper Bound		ft
* Lower Bound	0	ft	* Enforce Bounds	False	

User Value [BreatherVP]

* Parameter	0.3	psig	Upper Bound		psig
Lower Bound		psig	* Enforce Bounds	False	

User Value [BreatherVacP]

* Parameter	-0.7	psig	Upper Bound		psig
Lower Bound		psig	* Enforce Bounds	False	

User Value [DomeRadius]

Parameter		ft	Upper Bound		ft
Lower Bound		ft	* Enforce Bounds	False	

User Value [OpPress]

* Parameter	0	psig	Upper Bound		psig
Lower Bound		psig	* Enforce Bounds	False	

User Value [AvgPercentLiq]

* Parameter	50	%	Upper Bound		%
Lower Bound		%	* Enforce Bounds	False	

User Value [MaxPercentLiq]

* Parameter	90	%	Upper Bound		%
Lower Bound		%	* Enforce Bounds	False	

User Value [AnnNetTP]

* Parameter	170.839	bbl/day	Upper Bound		bbl/day
* Lower Bound	0	bbl/day	* Enforce Bounds	False	

User Value [OREff]

* Parameter	0	%	Upper Bound		%
Lower Bound		%	* Enforce Bounds	False	

User Value [AtmPressure]

* Parameter	14.2535	psia	Upper Bound		psia
Lower Bound		psia	* Enforce Bounds	False	

User Value [MaxLiqSurfaceT]

* Parameter	61.4758	°F	Upper Bound		°F
Lower Bound		°F	* Enforce Bounds	False	

User Value [TotalLosses]

* Parameter	7.94157	ton/yr	Upper Bound		ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False	

User Value [WorkingLosses]

* Parameter	2.45484	ton/yr	Upper Bound		ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False	

User Value Sets Report

Client Name:	EQT Production	Job: V1.0
Location:	OXF 160 Wellpad	

User Value [StandingLosses]

* Parameter	0.192351	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [RimSealLosses]

* Parameter	0	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [WithdrawalLoss]

* Parameter	0	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [LoadingLosses]

* Parameter	30.7303	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [DeckFittingLosses]

* Parameter	0	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [DeckSeamLosses]

* Parameter	0	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [FlashingLosses]

* Parameter	42.9328	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [GasMoleWeight]

* Parameter	0.0527663	kg/mol	Upper Bound	kg/mol
Lower Bound		kg/mol	* Enforce Bounds	False

Remarks
This User Value Set was programmatically generated. GUID={5524AB8C-40B1-4354-9DD7-EED65770BF87}

Tank Losses.331

User Value [ShellLength]

* Parameter	20	ft	Upper Bound	ft
* Lower Bound	0	ft	* Enforce Bounds	False

User Value [ShellDiam]

* Parameter	12	ft	Upper Bound	ft
* Lower Bound	0	ft	* Enforce Bounds	False

User Value [BreatherVP]

* Parameter	0.3	psig	Upper Bound	psig
Lower Bound		psig	* Enforce Bounds	False

User Value [BreatherVacP]

* Parameter	-0.7	psig	Upper Bound	psig
Lower Bound		psig	* Enforce Bounds	False

User Value Sets Report

Client Name:	EQT Production	Job: V1.0
Location:	OXF 160 Wellpad	

User Value [DomeRadius]

	Parameter	ft		Upper Bound	ft
	Lower Bound	ft	*	Enforce Bounds	False

User Value [OpPress]

*	Parameter	0 psig		Upper Bound	psig
	Lower Bound	psig	*	Enforce Bounds	False

User Value [AvgPercentLiq]

*	Parameter	50 %		Upper Bound	%
	Lower Bound	%	*	Enforce Bounds	False

User Value [MaxPercentLiq]

*	Parameter	90 %		Upper Bound	%
	Lower Bound	%	*	Enforce Bounds	False

User Value [AnnNetTP]

*	Parameter	1337.75 bbl/day		Upper Bound	bbl/day
*	Lower Bound	0 bbl/day	*	Enforce Bounds	False

User Value [OREff]

*	Parameter	0 %		Upper Bound	%
	Lower Bound	%	*	Enforce Bounds	False

User Value [AtmPressure]

*	Parameter	14.2535 psia		Upper Bound	psia
	Lower Bound	psia	*	Enforce Bounds	False

User Value [MaxLiqSurfaceT]

*	Parameter	75.9425 °F		Upper Bound	°F
	Lower Bound	°F	*	Enforce Bounds	False

User Value [TotalLosses]

*	Parameter	0.271397 ton/yr		Upper Bound	ton/yr
	Lower Bound	ton/yr	*	Enforce Bounds	False

User Value [WorkingLosses]

*	Parameter	0.0904658 ton/yr		Upper Bound	ton/yr
	Lower Bound	ton/yr	*	Enforce Bounds	False

User Value [StandingLosses]

*	Parameter	0 ton/yr		Upper Bound	ton/yr
	Lower Bound	ton/yr	*	Enforce Bounds	False

User Value [RimSealLosses]

*	Parameter	0 ton/yr		Upper Bound	ton/yr
	Lower Bound	ton/yr	*	Enforce Bounds	False

User Value [WithdrawalLoss]

*	Parameter	0 ton/yr		Upper Bound	ton/yr
	Lower Bound	ton/yr	*	Enforce Bounds	False

User Value [LoadingLosses]

*	Parameter	0.636489 ton/yr		Upper Bound	ton/yr
	Lower Bound	ton/yr	*	Enforce Bounds	False

User Value Sets Report

Client Name:	EQT Production	Job: V1.0
Location:	OXF 160 Wellpad	

User Value [DeckFittingLosses]

* Parameter	0	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [DeckSeamLosses]

* Parameter	0	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [FlashingLosses]

* Parameter	5.12786	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [GasMoleWeight]

* Parameter	0.0457789	kg/mol	Upper Bound	kg/mol
Lower Bound		kg/mol	* Enforce Bounds	False

Remarks
This User Value Set was programmatically generated. GUID={23417019-6BCF-4B6A-8C2C-C51E3F9510A8}

Certificate of Analysis

Number: 2030-13050229-003A

Carencro Laboratory
4790 NE Evangeline Thruway
Carencro, LA 70520

Alan Ball
Gas Analytical Services
PO Box 1028
Bridgeport, WV 26330

May 29, 2013

Station Name: 512425
Station Location: EQT Production
Sample Point: Submeter
Cylinder No: GAS
Analyzed: 05/29/2013 13:24:38 by CC

Sampled By: RM-GAS
Sample Of: Gas
Sample Date: 05/20/2013 13:15
Sample Conditions: 379 psig
Method: GPA 2286

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.73 psia
Nitrogen	0.532	0.729	
Carbon Dioxide	0.195	0.420	
Methane	78.965	61.996	
Ethane	13.780	20.278	3.697
Propane	4.195	9.053	1.159
Iso-Butane	0.507	1.442	0.166
n-Butane	1.013	2.881	0.320
Iso-Pentane	0.249	0.879	0.091
n-Pentane	0.239	0.844	0.087
i-Hexanes	0.113	0.461	0.045
n-Hexane	0.073	0.304	0.030
Benzene	0.002	0.008	0.001
Cyclohexane	0.011	0.044	0.004
i-Heptanes	0.057	0.266	0.025
n-Heptane	0.022	0.106	0.010
Toluene	0.004	0.017	0.001
i-Octanes	0.031	0.168	0.015
n-Octane	0.003	0.017	0.002
Ethylbenzene	NIL	NIL	NIL
Xylenes	0.002	0.007	0.001
i-Nonanes	0.003	0.027	0.002
n-Nonane	0.001	0.006	0.001
Decane Plus	0.003	0.047	0.004
	100.000	100.000	5.661

GPM TOTAL C2+ 5.661

Certificate of Analysis

Number: 2030-13050229-003A

Carencro Laboratory
4790 NE Evangeline Thruway
Carencro, LA 70520

Alan Ball
Gas Analytical Services
PO Box 1028
Bridgeport, WV 26330

May 29, 2013

Station Name:	512425	Sampled By:	RM-GAS
Station Location:	EQT Production	Sample Of:	Gas
Sample Point:	Submeter	Sample Date:	05/20/2013 13:15
Cylinder No:	GAS	Sample Conditions:	379 psig
Analyzed:	05/29/2013 13:24:38 by CC	Method:	GPA 2286

Physical Properties	**Total**	**C10+**
Calculated Molecular Weight	20.43	163.67
GPA 2172-09 Calculation:		
Calculated Gross BTU per ft³ @ 14.73 psia & 60°F		
Real Gas Dry BTU	1239.6	8669.4
Water Sat. Gas Base BTU	1218.5	8518.5
Relative Density Real Gas	0.7077	5.6511
Compressibility Factor	0.9966	

Patti L. Pecoro

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

Certificate of Analysis

Number: 2030-13050229-003A

Carencro Laboratory
4790 NE Evangeline Thruway
Carencro, LA 70520

Alan Ball
Gas Analytical Services
PO Box 1028
Bridgeport, WV 26330

May 29, 2013

Station Name:	512425	Sampled By:	RM-GAS
Station Location:	EQT Production	Sample Of:	Gas
Sample Point:	Submeter	Sample Date:	05/20/2013 13:15
Cylinder No:	GAS	Sample Conditions:	379 psig
Analyzed:	05/29/2013 13:24:38 by CC	Method:	GPA 2286

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.73 psia		
Nitrogen	0.532	0.729		GPM TOTAL C2+	5.661
Carbon Dioxide	0.195	0.420		GPM TOTAL C3+	1.964
Methane	78.965	61.996		GPM TOTAL iC5+	0.319
Ethane	13.780	20.278	3.697		
Propane	4.195	9.053	1.159		
Iso-butane	0.507	1.442	0.166		
n-Butane	1.013	2.881	0.320		
Iso-pentane	0.249	0.879	0.091		
n-Pentane	0.239	0.844	0.087		
Hexanes Plus	0.325	1.478	0.141		
	100.000	100.000	5.661		

Physical Properties	**Total**	**C6+**
Relative Density Real Gas	0.7077	3.2076
Calculated Molecular Weight	20.43	92.90
Compressibility Factor	0.9966	
GPA 2172-09 Calculation:		
Calculated Gross BTU per ft³ @ 14.73 psia & 60°F		
Real Gas Dry BTU	1239.6	5071.5
Water Sat. Gas Base BTU	1218.5	4983.2

Comments: H2O Mol% : 1.740 ; Wt% : 1.538

Patti L. Pecora

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

Certificate of Analysis

Number: 2030-13050229-003A

Carencro Laboratory
4790 NE Evangeline Thruway
Carencro, LA 70520

Alan Ball
Gas Analytical Services
PO Box 1028
Bridgeport, WV 26330

May 29, 2013

Station Name:	512425	Sampled By:	RM-GAS
Station Location:	EQT Production	Sample Of:	Gas
Sample Point:	Submeter	Sample Date:	05/20/2013 13:15
Cylinder No:	GAS	Sample Conditions:	379 psig
Analyzed:	05/29/2013 13:24:38 by CC	Method:	GPA 2286

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.73 psia		
Nitrogen	0.532	0.729		GPM TOTAL C2+	5.661
Carbon Dioxide	0.195	0.420		GPM TOTAL C3+	1.964
Methane	78.965	61.995		GPM TOTAL iC5+	0.319
Ethane	13.780	20.278	3.697		
Propane	4.195	9.053	1.159		
Iso-Butane	0.507	1.442	0.166		
n-Butane	1.013	2.882	0.320		
Iso-Pentane	0.249	0.879	0.091		
n-Pentane	0.239	0.844	0.087		
Hexanes	0.186	0.765	0.075		
Heptanes Plus	0.139	0.713	0.066		
	100.000	100.000	5.661		

Physical Properties	**Total**	**C7+**
Relative Density Real Gas	0.7077	3.5343
Calculated Molecular Weight	20.43	102.36
Compressibility Factor	0.9966	
GPA 2172-09 Calculation:		
Calculated Gross BTU per ft³ @ 14.73 psia & 60°F		
Real Gas Dry BTU	1239.6	5520.5
Water Sat. Gas Base BTU	1218.5	5424.5

Comments: H2O Mol% : 1.740 ; Wt% : 1.538

Patti L. Pecoro

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

13050229

Gas Analytical Services, Inc.

P.O. Box 1028, Bridgeport, WV 26330
205 Water Street, Stonewood, WV 26301
(304) 623-0020 fax: (304) 624-8076
email: lab@gasana.com

Referred to: Southern Petroleum Labs
4790 NE Evangeline Thruway
Carencro, LA 70520
attn: Patti Petro

Date: 5/21/2013

Testing Requested

** SCF Base Conditions: P_b 14.73 psia / T_b: 60 Df

	Client	Location	Date of Collection	Sulfur Speciation (GPA-2199)	Total Sulfur (GPA-2199)	Extended Hydrocarbon C1..C10 (GPA-2286)	Hydrocarbon Dewpoint	Gas Temperature
1	EQT Production	512507	5/20/2013			X		
2	EQT Production	512541	5/20/2013			X		
3	EQT Production	512425	5/20/2013			X		
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								

Please email results to:
lab@gasana.com

Submitted by:
Alan Ball, Lab Technician
Stonewood, WV Laboratory

Received by: 5/29/13

Gas Analytical Services

Telephone: 304-623-0020
205 Water Street
Stonewood, WV 26301

Date of Collection: 5/20/13
Time of Collection: 12:00 PM
Meter ID Number: 512507

Company Name: EQT
Sample Source: 512507
Sample Pressure: 313 psi.
Sample Type:
☒ Wellhead ☐ Submeter ☐ Master Meter ☐ Alternative Fuel ☐ Source Analysis
Sampled By: GARY ROSS
Who declares that this sample was obtained from the source indicated above.
Comments: EXTENDED ANALYSIS SEND RESULTS to Bob Gum

1305D229-001A

Gas Analytical Services

Telephone: 304-623-0020
205 Water Street
Stonewood, WV 26301

Date of Collection: 5/20/13
Time of Collection: 12:30 PM
Meter ID Number:

Company Name: EQT Production
Sample Source: 512457
Sample Pressure: 336 psi.
Sample Type:
☒ Wellhead ☐ Submeter ☐ Master Meter ☐ Alternative Fuel ☐ Source Analysis
Sampled By: RONNIE MOORE
Who declares that this sample was obtained from the source indicated above.
Comments: EXTENDED ANALYSIS ATTN: Bob Gum.

002A

Gas Analytical Services

Telephone: 304-623-0020
205 Water Street
Stonewood, WV 26301

Date of Collection: 5/20/13
Time of Collection: 1:45 PM
Meter ID Number:

Company Name: EQT Production
Sample Source: 512425
Sample Pressure: 379 psi.
Sample Type:
☐ Wellhead ☒ Submeter ☐ Master Meter ☐ Alternative Fuel ☐ Source Analysis
Sampled By: RONNIE MOORE
Who declares that this sample was obtained from the source indicated above.
Comments: EXTENDED ANALYSIS ATTN: Bob GUM

003A

LAFAYETTE AREA LABORATORY
4790 N.E. EVANGELINE THRUWAY
CARENCRO, LA 70520
PHONE (337) 896-3055
FAX (337) 896-3077

Certificate of Analysis : 13070241-001A

Company:	Gas Analytical Services	**For:**	Gas Analytical Services
Well:	513173 OXF 160 Pad		Alan Ball
Field:	EQT Production		PO Box 1028
Sample of:	Liquid-Spot		
Conditions:	407 @ N.G.		Bridgeport, WV, 26330
Sampled by:	RM-GAS		
Sample date:	7/16/2013	**Report Date:**	8/1/2013
Remarks:	Cylinder No.: GAS		
Remarks:			

Analysis: (*GPA 2186M*)	**Mol. %**	**MW**	**Wt. %**	**Sp. Gravity**	**L.V. %**
Nitrogen	0.000	28.013	0.000	0.8094	0.000
Methane	11.209	16.043	1.819	0.3000	4.208
Carbon Dioxide	0.077	44.010	0.034	0.8180	0.029
Ethane	8.553	30.070	2.602	0.3562	5.064
Propane	7.326	44.097	3.268	0.5070	4.468
Iso-butane	1.920	58.123	1.129	0.5629	1.391
N-butane	5.327	58.123	3.132	0.5840	3.720
Iso-pentane	3.053	72.150	2.228	0.6244	2.475
N-pentane	3.803	72.150	2.776	0.6311	3.051
i-Hexanes	3.444	86.177	2.968	0.6795	3.109
n-Hexane	3.420	85.701	2.983	0.6640	3.096
2,2,4 trimethylpentane	0.024	114.231	0.028	0.6967	0.028
Benzene	0.136	78.114	0.091	0.8846	0.084
Heptanes	11.451	98.096	11.403	0.7017	11.277
Toluene	0.727	92.141	0.580	0.8719	0.542
Octanes	10.496	107.788	11.657	0.7511	10.759
E-benzene	0.112	106.167	0.050	0.8718	0.096
M-,O-,P-xylene	1.258	106.167	1.348	0.8731	1.082
Nonanes	7.432	122.846	9.540	0.7596	8.810
Decanes Plus	20.232	206.984	42.364	0.8004	36.711
	100.000		100.000		100.000

Calculated Values	**Total Sample**	**Decanes Plus**
Specific Gravity at 60 °F	0.6936	0.8004
Api Gravity at 60 °F	72.508	45.286
Molecular Weight	98.853	206.984
Pounds per Gallon (in Vacuum)	5.783	6.673
Pounds per Gallon (in Air)	5.777	6.666
Cu. Ft. Vapor per Gallon @ 14.73 psia	22.251	12.207

Brian Gaspard

Southern Petroleum Laboratories, Inc.

LAFAYETTE AREA LABORATORY
4790 N.E. EVANGELINE THRUWAY
CARENCRO, LA 70520
PHONE (337) 896-3055
FAX (337) 896-3077

Certificate of Analysis : 13070241-001A

Company:	Gas Analytical Services	**For:**	Gas Analytical Services
Well:	513173 OXF 160 Pad		Alan Ball
Field:	EQT Production		PO Box 1028
Sample of:	Liquid-Spot		
Conditions:	407 @ N.G.		Bridgeport, WV, 26330
Sampled by:	RM-GAS		
Sample date:	7/16/2013	**Report Date:**	8/1/2013
Remarks:	Cylinder No.: GAS		
Remarks:			

Analysis: (*GPA 2103M*)	**Mol. %**	**MW**	**Wt. %**	**Sp. Gravity**	**L.V. %**
Nitrogen	0.000	28.013	0.000	0.8094	0.000
Methane	11.209	16.043	1.819	0.3000	4.208
Carbon Dioxide	0.077	44.010	0.034	0.8180	0.029
Ethane	8.553	30.070	2.602	0.3562	5.064
Propane	7.326	44.097	3.268	0.5070	4.468
Iso-butane	1.920	58.123	1.129	0.5629	1.391
N-butane	5.327	58.123	3.132	0.5840	3.720
Iso-pentane	3.053	72.150	2.228	0.6244	2.475
N-pentane	3.803	72.150	2.776	0.6311	3.051
Hexanes	6.864	85.701	5.951	0.6653	6.205
Heptanes Plus	51.868	98.096	77.061	0.7017	69.389
	100.000		100.000		100.000

Calculated Values	**Total Sample**	**Heptanes Plus**
Specific Gravity at 60 °F	0.6936	0.7720
Api Gravity at 60 °F	72.508	51.783
Molecular Weight	98.853	146.867
Pounds per Gallon (in Vacuum)	5.783	6.437
Pounds per Gallon (in Air)	5.777	6.430
Cu. Ft. Vapor per Gallon @ 14.73 psia	22.251	16.670
Standing-Katz Density (lb. / ft^3)		

Brian Gaspard

Southern Petroleum Laboratories, Inc.

Certificate of Analysis

Number: 2030-13070241-001A

Carencro Laboratory
4790 NE Evangeline Thruway
Carencro, LA 70520

Alan Ball
Gas Analytical Services
PO Box 1028
Bridgeport, WV 26330

July 31, 2013

Station Name: 513173 OXF 160 Pad
Station Location: EQT Production
Sample Point: Wellhead
Cylinder No: GAS

Sampled By: RM-GAS
Sample Of: Liquid Spot
Sample Date: 07/16/2013 09:15
Sample Conditions: 407 psig

Analytical Data

Test	Method	Result	Units	Detection Limit	Lab Tech.	Analysis Date
Color Visual	Proprietary	L STRAW			AR	07/30/2013
API Gravity @ 60° F	ASTM D-5002	60.54	°		AR	07/30/2013
Specific Gravity @ 60/60° F	ASTM D-5002	0.7368			AR	07/30/2013
Density @ 60° F	ASTM D-5002	0.7361	g/ml		AR	07/30/2013
Shrinkage Factor	Proprietary	0.8882			AR	07/30/2013
Flash Factor	Proprietary	252.7311	Cu. Ft./S.T. Bbl		AR	07/30/2013

Patti L. Petro

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

1307024

Gas Analytical Services, Inc.

P.O. Box 1028, Bridgeport, WV 26330
205 Water Street, Stonewood, WV 26301
(304) 623-0020 fax: (304) 624-8076
email: lab@gasana.com

Referred to: Southern Petroleum Labs
4790 NE Evangeline Thruway
Carencro, LA 70520
attn: Patti Petro

Date: 7/16/2013

Testing Requested

** SCF Base Conditions: P_b 14.73 psia / T_b: 60 Df

	Client	Location	Date of Collection	Sulfur Speciation (GPA-2199)	Total Sulfur (GPA-2199)	Extended Hydrocarbon C1..C10 (GPA-2286)	Hydrocarbon Dewpoint	Gas Temperature
1	EQT Production	513173 Oxford 160 Pad	7/16/2013			X		
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								

Please email results to:
lab@gasana.com

Alan Ball
Submitted by:
Alan Ball, Lab Technician
Stonewood, WV Laboratory

Received by: 7/23/13

Gas Analytical Services

Telephone: 304-623-0020
205 Water Street
Stonewood, WV 26301

Date of Collection: 7-16-13
Time of Collection: 9:15 AM
Meter ID Number: 513173

Company Name: EQT
Sample Source: 513173 OXFORD 160 PAD
Sample Pressure: 407 psi
Analysis Type ☐ Standard ☐ Extended
Sample Type: CONDENSATE SAMPLE
☒ Wellhead ☐ Submeter ☐ Master Meter ☐ Alternative Fuel ☐ Source Analysis
Sampled By: Ronnie Moore / Gary Ross
Who declares that this sample was obtained from the source indicated above.
Comments: SEND RESULTS TO FIL Scullo,
REGINA HENRY, Michael Hedge

1307024I-001A

ATTACHMENT U

Emission Summary Sheet

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
C001 (S013-S018, S012, C001)	1.15	5.03	0.96	4.22	1.16	1.63	0.01	0.03	0.09	0.38	0.09	0.38	0.21	0.92	1,376.36	6,028.45
C002 (S013-S018, S012, C002)	1.89	8.28	1.59	6.95	1.16	1.63	0.01	0.05	0.14	0.63	0.14	0.63	0.21	0.92	2,261.35	9,904.73
E005 (S005)	0.15	0.64	0.12	0.54	0.01	0.04	8.8E-04	3.9E-03	0.01	0.05	0.01	0.05	0.00	0.01	180.18	789.20
E006 (S006)	0.15	0.64	0.12	0.54	0.01	0.04	8.8E-04	3.9E-03	0.01	0.05	0.01	0.05	0.00	0.01	180.18	789.20
E007 (S007)	0.15	0.64	0.12	0.54	0.01	0.04	8.8E-04	3.9E-03	0.01	0.05	0.01	0.05	0.00	0.01	180.18	789.20
E008	0.15	0.64	0.12	0.54	0.01	0.04	8.8E-04	3.9E-03	0.01	0.05	0.01	0.05	0.00	0.01	180.18	789.20
E009	1.2E-03	0.01	1.0E-03	4.5E-03	6.8E-05	3.0E-04	7.4E-06	3.2E-04	9.4E-05	4.1E-04	9.4E-05	4.1E-04	0.00	0.00	1.52	6.64
E010	1.2E-03	0.01	1.0E-03	4.5E-03	6.8E-05	3.0E-04	7.4E-06	3.2E-04	9.4E-05	4.1E-04	9.4E-05	4.1E-04	0.00	0.00	1.52	6.64
E019 (S019)	0.29	1.28	0.25	1.08	0.02	0.07	1.8E-03	7.7E-03	0.02	0.10	0.02	0.10	0.01	0.03	360.36	1,578.39
E020 (S020)	0.29	1.28	0.25	1.08	0.02	0.07	1.8E-03	7.7E-03	0.02	0.10	0.02	0.10	0.01	0.03	360.36	1,578.39
E021 (S021)	0.29	1.28	0.25	1.08	0.02	0.07	1.8E-03	7.7E-03	0.02	0.10	0.02	0.10	0.01	0.03	360.36	1,578.39
E022 (S022)	0.29	1.28	0.25	1.08	0.02	0.07	1.8E-03	7.7E-03	0.02	0.10	0.02	0.10	0.01	0.03	360.36	1,578.39
E023 (S023)	0.10	0.42	0.08	0.35	0.01	0.02	5.7E-04	2.5E-03	0.01	0.03	0.01	0.03	0.00	0.01	117.12	512.98
E011 (S011)	---	---	---	---	0.06	0.24	---	---	---	---	---	---	0.02	0.09	0.53	2.33

E024 (S024)	0.61	2.66	1.21	5.31	0.47	2.04	0.00	0.01	0.04	0.17	0.04	0.17	0.00	0.02	316.12	1,384.59
E012 (S012)	---	---	---	---	36.13	9.39	---	---	---	---	---	---	---	---	---	---
Fugitives	---	---	---	---	---	20.64	---	---	---	---	---	---	---	12.82	---	357.00
Haul Roads	---	---	---	---	---	---	---	---	---	4.72	---	0.47	---	---	---	---
Facility Total	5.50	24.09	5.32	23.32	39.09	36.01	0.03	0.13	0.41	6.53	0.41	2.27	0.49	14.96	6,236.69	27,673.70
Facility Total (excl. fugitives)	5.50	24.09	5.32	23.32	39.09	15.37	0.03	0.13	0.41	1.80	0.41	1.80	0.49	2.14	6.236.69	27,316.71

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
C001 (S013-S018, S012, C001)	---	---	1.1E-03	1.2E-02	1.7E-03	4.3E-03	8.0E-05	2.3E-03	8.8E-04	2.3E-03	0.02	0.03	0.03	0.04
C002 (S013-S018, S012, C002)	---	---	1.1E-03	1.2E-02	1.7E-03	4.3E-03	8.0E-05	2.3E-03	8.8E-04	2.3E-03	0.02	0.03	0.03	0.04
E005 (S005)	1.1E-04	4.8E-04	3.1E-06	1.3E-05	5.0E-06	2.2E-05	---	---	---	---	2.6E-03	0.01	2.8E-03	0.01
E006 (S006)	1.1E-04	4.8E-04	3.1E-06	1.3E-05	5.0E-06	2.2E-05	---	---	---	---	2.6E-03	0.01	2.8E-03	0.01
E007 (S007)	1.1E-04	4.8E-04	3.1E-06	1.3E-05	5.0E-06	2.2E-05	---	---	---	---	2.6E-03	0.01	2.8E-03	0.01
E008 (S008)	1.1E-04	4.8E-04	3.1E-06	1.3E-05	5.0E-06	2.2E-05	---	---	---	---	2.6E-03	0.01	2.8E-03	0.01
E009 (S009)	9.3E-07	4.1E-06	2.6E-08	1.1E-07	4.2E-08	1.8E-07	---	---	---	---	2.2E-05	9.7E-05	2.3E-05	1.0E-04
E010 (S010)	9.3E-07	4.1E-06	2.6E-08	1.1E-07	4.2E-08	1.8E-07	---	---	---	---	2.2E-05	9.7E-05	2.3E-05	1.0E-04
E019 (S019)	2.2E-04	9.6E-04	6.2E-06	2.7E-05	1.0E-05	4.4E-05	---	---	---	---	5.3E-02	0.02	5.5E-03	0.02
E020 (S020)	2.2E-04	9.6E-04	6.2E-06	2.7E-05	1.0E-05	4.4E-05	---	---	---	---	5.3E-02	0.02	5.5E-03	0.02
E021 (S021)	2.2E-04	9.6E-04	6.2E-06	2.7E-05	1.0E-05	4.4E-05	---	---	---	---	5.3E-02	0.02	5.5E-03	0.02
E022 (S022)	2.2E-04	9.6E-04	6.2E-06	2.7E-05	1.0E-05	4.4E-05	---	---	---	---	5.3E-02	0.02	5.5E-03	0.02
E023 (S023)	7.1E-05	3.1E-04	2.0E-06	8.8E-06	3.2E-06	1.4E-05	---	---	---	---	1.7E-03	0.01	1.8E-03	0.01
E011 (S011)	---	---	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.0E-03	0.0E+00	1.0E-03	3.0E-03
E024 (S024)	0.04	0.18	3.2E-03	1.4E-02	1.1E-03	5.0E-03	5.1E-05	2.2E-04	4.0E-04	1.7E-03	---	---	6.6E-02	2.9E-01
E012 (S012)	---	---	0.03	0.01	0.03	0.01	1.4E-03	3.7E-04	1.6E-02	4.1E-03	0.66	0.17	0.83	0.22
Fugitives	---	---	---	0.01	---	0.02	---	0.0E+00	---	0.01	---	0.35	---	0.64

Haul Roads	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Facility Total	0.04	0.19	0.03	0.03	0.04	0.04	1.7E-03	1.0E-03	0.02	0.02	0.74	0.73	0.99	1.39
Facility Total (excl. fugitives)	0.04	0.19	3.2E-02	0.03	3.7E-02	2.2E-02	1.7E-03	1.0E-03	1.8E-02	1.1E-02	0.74	0.38	0.99	0.75

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

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

RECOMMENDED PUBLIC NOTICE TEMPLATE

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that EQT Production Company has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a G70-D General Permit Registration for an existing natural gas production facility OXF-160 located on Upper Run Road, near Oxford, in Doddridge County, West Virginia. The latitude and longitude coordinates are: 39.18169 N, -80.79904 W.

The applicant estimates the potential to discharge the following Regulated Air Pollutants will be:

Pollutant	Emissions in tpy (tons per year)
NOx	24.09
CO	23.32
VOC	15.37
SO_2	0.13
PM	6.53
Formaldehyde	0.19
Benzene	0.03
Toluene	0.04
Ethylbenzene	0.001
Xylene	0.02
n-Hexane	0.73
Total HAPs	1.39
Carbon Dioxide Equivalents (CO_2e)	26,637.31

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 1250, during normal business hours.
Dated this the **(Day)** day of **(Month)**, 2016.

By: EQT Production Company
Mike Gavin, Vice President
625 Liberty Ave Suite 1700
Pittsburgh, PA 15222

ATTACHMENT W

General Permit Registration Application Fee