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Alex Bosiljevac
Environmental Coordinator

April 26, 2016

CERTIFIED MAIL # 7015 1660 0000 9399 6130

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

RE: G70B Permit Application
EQT Production Company
WEU-51 Natural Gas Production Site
Facility ID No. 017-00130

Dear Mr. Durham,

Enclosed are two electronic copies and one original hard copy of a proposed application for a G70-B General Air Permit for the WEU-51 Natural Gas Production Well Site. The site currently operates under a G70-A General Air Permit (G70-A099A). Please note that this application satisfies a requirement in Consent Order CO-R13-E-2016-04, in which EQT Production Company is required to submit an application with the equipment specified in the consent order. A legal advertisement will be published in 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,

Alex Bosiljevac
EQT Corporation

Enclosures

PROJECT REPORT

EQT Production
WEU-51 Pad

G70-B Permit Application

Where energy meets innovation.

TRINITY CONSULTANTS
4500 Brooktree Drive
Suite 103
Wexford, PA 15090
(724) 935-2611

March 2016

Environmental solutions delivered uncommonly well

TABLE OF CONTENTS

EQT Production Company (EQT) is submitting this Class II General Permit (G70-B) application to the West Virginia Department of Environmental Protection (WVDEP) for the construction and operation of new equipment at an existing natural gas production well pad, WEU-51, located in Doddridge County, West Virginia. The WEU-51 pad is currently operating under G70-A permit number G70-A099.

1.1. FACILITY AND PROJECT DESCRIPTION

The WEU-51 pad is a natural gas production facility that consists of seven (7) 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 WEU-51 pad currently consists of the following equipment:

- Eight (8) 400 barrel (bbl) storage tanks for condensate/water (produced fluids) controlled by two (2) existing combustors rated at 11.66 MMBtu/hr each;
- Seven (7) line heaters 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 WEU-51 pad:

- One low pressure separator and associated 1.15 MMbtu/hr line heater;
- One vapor recovery unit (VRU) powered by a natural gas fired 110 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-B 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-B permit, fugitive emissions are not considered in determining eligibility of the permit for non-HAP pollutants.

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

Pollutant	Wellpad Potential Annual Emissions (tpy)	G70-B Maximum Annual Emission Limits (tpy)
Nitrogen Oxides	16.11	50
Carbon Monoxide	14.76	80
Volatile Organic Compounds	2.79	80
Particulate Matter – 10/2.5	1.21	20
Sulfur Dioxide	0.09	20
Highest Single HAP (n-hexane)[1]	0.62	8
Total HAPs[1]	1.36	20

1. Emissions include fugitives.

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 WEU-51 Pad for air permitting purposes if, and only if, all three elements of the "stationary source" definition above are fulfilled.

WVDEP determined that the WEU-51 pad is a separate stationary source when the current permit was issued. There are no Marcellus facilities within a quarter-mile radius of the WEU-51 Pad. The nearest wellpad, WEU-1, is located approximately 1.1 miles northwest of WEU-51. Therefore, the WEU-51 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-B APPLICATION ORGANIZATION

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

- Section 2: Sample Emission Source Calculations;
- Section 3: Regulatory Discussion;
- Section 4: G70-B 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: 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 **(Not Applicable)**;
- Attachment R: Air Pollution Control Device Data Sheet;
- Attachment S: Emission Calculations;
- Attachment T: Emission Summary Sheet;
- Attachment U: Class I Legal Advertisement; and
- Attachment V: 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 and TEGs, 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, Enclosed Combustors and TEGs:** 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 Engine:** Potential emissions of oxides of nitrogen (NO_X), carbon monoxide (CO), and volatile organic compounds (VOC) are calculated using vendor emission factors. 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 site-specific heat content of natural gas. Greenhouse gas emissions are calculated according to 40 CFR 98 Subpart C.[4]

- **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.[5] Pneumatic devices at the wellpad are intermittent bleed and are assumed to be in operation 1/3 of the year.

- **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 98%. The throughput for the produced fluids tanks are based on the maximum annualized monthly condensate and produced water at the WEU-51 well pad (i.e., the maximum monthly throughput for the pad times 12), and includes a safety factor of 20%. The composition for the analysis was from a sample taken at WEU-51. 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:

$$Throughput\left(\frac{bbl}{day}\right) = \left(Condensate\ Throughput\left(\frac{bbl}{month}\right) + \left(Produced\ Water\ Throughput\left(\frac{bbl}{month}\right)\right)\right) * \frac{12\left(\frac{months}{year}\right)}{365\left(\frac{days}{year}\right)} * 1.2$$

- **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 C, *General Stationary Fuel combustion Sources*, Tables C-1 and C-2.
[5] 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.[6]

- **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.[7]

[6] U.S. EPA, AP 42, Fifth Edition, Volume I, Chapter 5.2, Transportation And Marketing Of Petroleum Liquids, June 2008.
[7] 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-B 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.[8] 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.

[8] On June 23, 2014, the U.S Supreme Court decision in the case of *Utility Air Regulatory Group v. EPA* effectively changed the permitting procedures for GHGs under the PSD and Title V programs.

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 Subpart 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 engine (VRU engine) at the well pad is a 4-stroke rich burn, spark ignition engine manufactured after July 1, 2008, 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(b)(2) (maintenance plan/records and performance testing frequency) for noncertified affected SI ICE at the facility or by purchasing a certified engine. At this time, EQT intends to purchase a certified engine

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 (see clarification below regarding dates). This NSPS was published in the Federal Register on August 16, 2012, and subsequently amended. Although there are sources proposed to be installed that could potentially be subject to this regulation, due to the anticipated installation dates, they will not be subject to the rule. This is due to the most recent proposed developments related to the rule, which are the inclusion of an end date for applicability to Subpart OOOO

(September 18, 2015) and the promulgation of 40 CFR 60 Subpart OOOOa.[9] The potential 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, will apply to affected facilities that commenced construction, reconstruction, or modification after September 18, 2015. This regulation has yet to be finalized. The currently proposed version of 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, gathering, processing, or transmission and storage 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 current version of the proposed rule, the following paragraphs describe the potential 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 eight (8) produced fluid storage vessels and one (1) sand separator storage vessel at the wellpad. The storage vessels at the facility each have potential VOC emissions less than 6 tpy based on the permit application materials and enforceable limits to be included in the G70-B permit. As such, per 60.5365a(e), the tanks will not be storage vessel affected facilities under the rule.

Note that the proposed changes to the well pad do not meet the definition of modification under 60.5365a(i)(3)(i). Therefore, EQT will not be the leak detection and repair provisions of this subpart.

The pneumatic controllers will potentially 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.

[9] September 18, 2015 publication in Federal Register: https://www.federalregister.gov/articles/2015/09/18/2015-21023/oil-and-natural-gas-sector-emission-standards-for-new-and-modified-sources

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 WEU-51 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 proposed line heater will be natural gas-fired and is 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 TEGs and 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-B APPLICATION FORMS

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

West Virginia Department of Environmental Protection

Division of Air Quality
601 57th Street SE
Charleston, WV 25304
Phone (304) 926-0475
Fax (304) 926-0479
www.dep.wv.gov

G70-B GENERAL PERMIT REGISTRATION APPLICATION

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

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

SECTION 1. GENERAL INFORMATION

Name of Applicant (as registered with the WV Secretary of State's Office): 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: WEU-51 Pad

Operating Site Physical Address: Maxwell Ridge Rd, West Union, WV
If none available, list road, city or town and zip of facility.

City: West Union | Zip Code: 26456 | County: Doddridge

Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits):
Latitude: 39.25592 N
Longitude: -80.76326 W

SIC Code: 1311

NAICS Code: 211111

DAQ Facility ID No. (For existing facilities) 017-00130

CERTIFICATION OF INFORMATION

This G70-B 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-B Registration Application will be returned to the applicant. Furthermore, if the G70-B forms are not utilized, the application will be returned to the applicant. No substitution of forms is allowed.**

I hereby certify that Kenneth Kirk 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-B 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: Kenneth Kirk, Executive Vice President | Phone: | Fax:
Email: KKirk@eqt.com | Date: 4-26-2016

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, WV: Head south on Neely Avenue towards West Main Street. Turn left onto West Main street (0.4 miles). Turn right onto WV-18S (2.5 miles). Turn right onto Maxwell Ridge and travel approximately 2.2 miles to site.

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 and/or OOOO [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 in its entirety)** – 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-B 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 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	
☒ Air Pollution Control Device/Emission Reduction Device(s) Sheet(s) (include manufacturer performance data sheet(s) if applicable) – Attachment R	
☒ Emission Calculations (please be specific and include all calculation methodologies used) – Attachment S	
☒ Facility-wide Emission Summary Sheet(s) – Attachment T	
☒ Class I Legal Advertisement – Attachment U	
☒ 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).

Is there a facility owned by or associated with the natural gas industry located within one (1) mile of the proposed facility? Yes ☐ No ☒

If Yes, please complete the questionnaire on the following page (Attachment A).

Please provide a source aggregation analysis for the proposed facility below:

Please see discussion in the Application Report.

ATTACHMENT A - SINGLE SOURCE DETERMINATION FORM – NOT APPLICABLE

Answer each question with a detailed explanation to determine contiguous or adjacent properties which are under a common control and any support facilities. This section must be completed in its entirety.

Provide a map of contiguous or adjacent facilities (production facilities, compressor stations, dehydration facilities, etc.) which are under common control and those facilities that are not under common control but are support facilities. Please indicate the SIC code, permit number (if applicable), and the distance between facilities in question on the map.

Are the facilities owned by the same parent company or a subsidiary of the parent company? Provide the owners identity and the percentage of ownership of each facility.	Yes ☐ No ☐
Does an entity such as a corporation have decision making authority over the operation of a second entity through a contractual agreement or voting interest? Please explain.	Yes ☐ No ☐
Is there a contract for service relationship between the two (2) companies or, a support/dependency relationship that exists between the two (2) companies? Please explain.	Yes ☐ No ☐
Do the facilities share common workforces, plant managers, security forces, corporate executive officers or board executives?	Yes ☐ No ☐
Will managers or other workers frequently shuttle back and forth to be involved actively at both facilities?	Yes ☐ No ☐
Do the facilities share common payroll activities, employee benefits, health plans, retirement funds, insurance coverage, or other administrative functions? Please explain.	Yes ☐ No ☐
Does one (1) facility operation support the operation of the other facility?	Yes ☐ No ☐
Is one (1) facility dependent on the other? If one (1) facility shuts down, what are the limitations on the other to pursue outside business? Please explain.	Yes ☐ No ☐
Are there any financial arrangements between the two (2) entities?	Yes ☐ No ☐
Are there any legal or lease agreements between the two (2) facilities?	Yes ☐ No ☐
Do the facilities share products, byproducts, equipment, or other manufacturing or air pollution control device equipment? Please explain.	Yes ☐ No ☐
Do all the pollutant-emitting activities at the facilities belong to the same SIC Code? Please provide the SIC Codes.	Yes ☐ No ☐
Was the location of the new facility chosen primarily because of its proximity to the existing facility to integrate the operation of the two (2) facilities? Please explain.	Yes ☐ No ☐
Will materials be routinely transferred between the two (2) facilities? Please explain the amount of transfer and how often the transfers take place and what percentages go to the various entities.	Yes ☐ No ☐
Does the facility influence production levels or compliance with environmental regulations at other facilities? Who accepts the responsibility for compliance with air quality requirements? Please explain.	Yes ☐ No ☐

ATTACHMENT B

Siting Criteria Waiver *(Not Applicable)*

ATTACHMENT B - SITING CRITERIA WAIVER – NOT APPLICABLE
If applicable, please complete this form and it must be notarized.

G70-B 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

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.

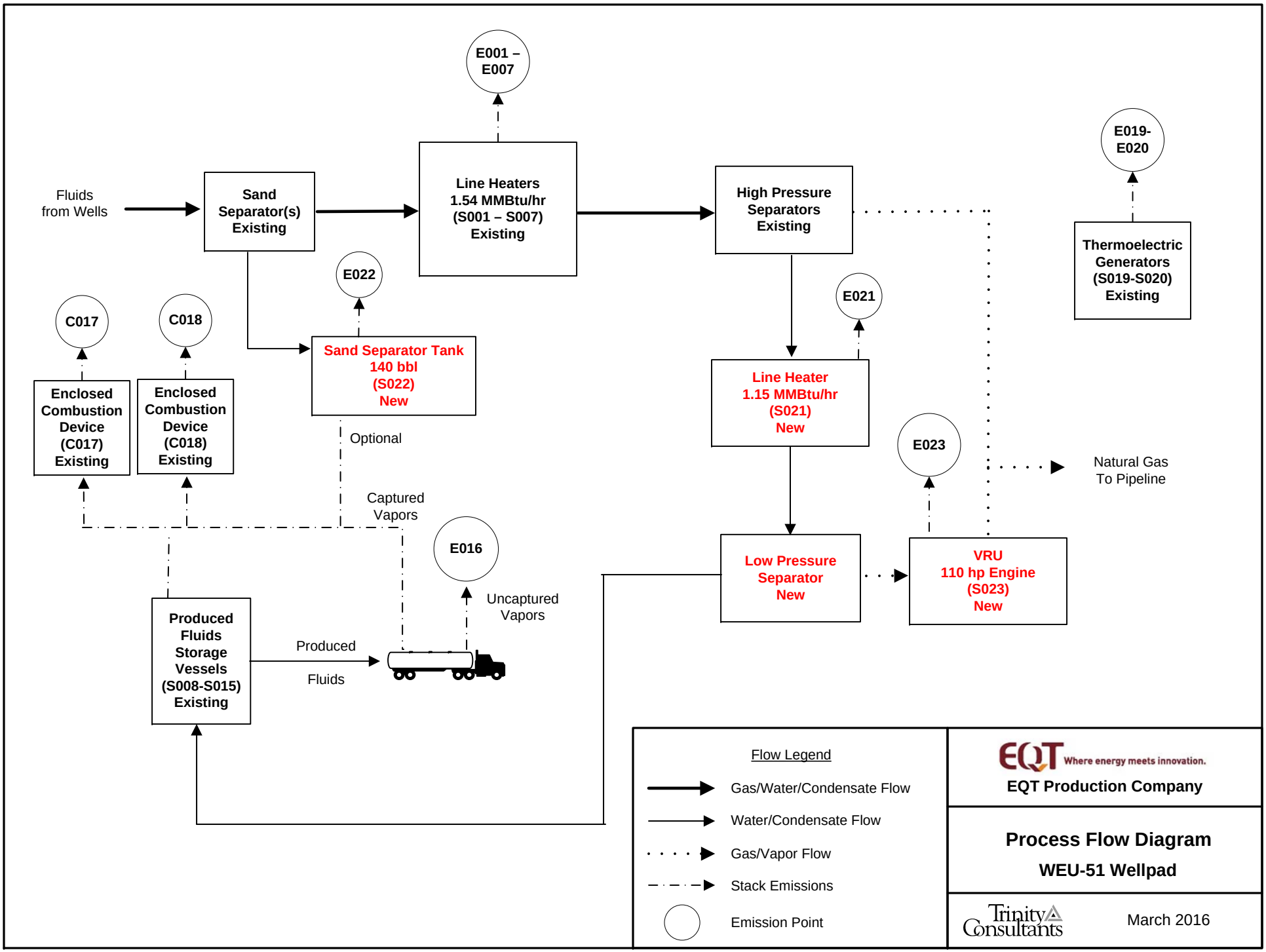
Change in name or change of location shall be considered a cessation of the business and a new certificate shall be required.

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


E001 – E007
Fluids from Wells
Sand Separator(s) Existing
Line Heaters 1.54 MMBtu/hr (S001 – S007) Existing
High Pressure Separators Existing
E019-E020
Thermoelectric Generators (S019-S020) Existing
E022
C017
C018
Sand Separator Tank 140 bbl (S022) New
E021
Enclosed Combustion Device (C017) Existing
Enclosed Combustion Device (C018) Existing
Line Heater 1.15 MMBtu/hr (S021) New
E023
Natural Gas To Pipeline
Optional
Captured Vapors
E016
Low Pressure Separator New
VRU 110 hp Engine (S023) New
Uncaptured Vapors
Produced Fluids Storage Vessels (S008-S015) Existing
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
WEU-51 Wellpad
Trinity Consultants
March 2016

ATTACHMENT E

Process Description

ATTACHMENT E: PROCESS DESCRIPTION

This G70-B Permit Application involves the permitting of a low pressure separator and associated heater (S021), a vapor recovery unit (S023), and a sand separator storage tank (S022) at an existing natural gas production wellpad (WEU-51). The wellpad consists of seven (7) wells, each with the same basic operation.

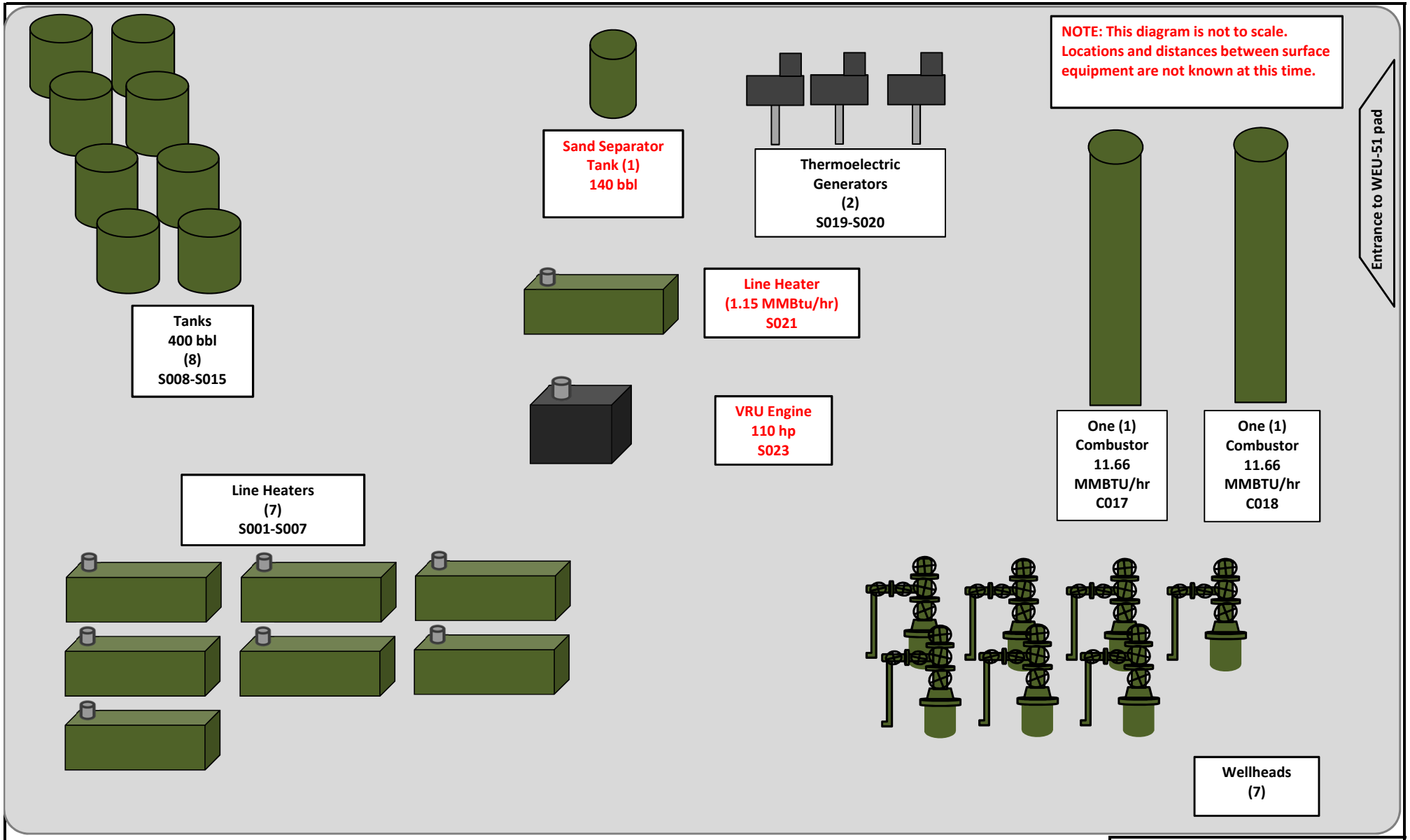
The incoming gas/liquid stream from the underground well will pass through a sand separator, where sand, water, and residual solids are displaced and transferred to the sand separator tank (S022). The gas stream will then pass through a line heater (S001-S007) to raise/maintain temperature. The stream will then pass through a high pressure separator, which will separate gas (natural gas from the separator is sent to the sales line) from liquids (condensate and produced water). The liquids stream will then pass through a low pressure separator, where it is heated (S021) to volatilize (flash off) lighter hydrocarbons and separate condensate from water in the combined liquid stream. The flash gas from the condensate stream is recovered by the vapor recovery unit (S023), 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 condensate is then transferred to the produced fluid storage vessels (S008-S015).

Emissions from the storage vessels are controlled by an enclosed combustor (C017-C018). 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 (S016) are routed back into the battery of tanks and ultimately to the combustor. Facility electricity is provided by thermoelectric generators (S019-S020).

A process flow diagram is included as Attachment D.

ATTACHMENT F

Plot Plan



Attachment F

WEU-51 Well Pad Plot Plan

ATTACHMENT G

Area Map

ATTACHMENT G: AREA MAP

Figure 1 - Map of WEU-51 Location

UTM Northing (KM): 4,345.203
UTM Easting (KM): 520.425
Elevation: ~1,229 ft

ATTACHMENT H

Applicability Form

General Permit G70-B Registration
Section Applicability Form

General Permit G70-B 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, centrifugal compressors, reciprocating compressors, reciprocating internal combustion engines (RICEs), tank truck 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-B 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-B APPLICABLE SECTIONS	
☒ Section 5.0	Gas Well Affected Facility (NSPS, Subpart OOOO)
☒ Section 6.0	Storage Vessels Containing Condensate and/or Produced Water[1]
☐ Section 7.0	Storage Vessel Affected Facility (NSPS, Subpart OOOO)
☒ Section 8.0	Control Devices and Emission Reduction Devices not subject to NSPS Subpart OOOO 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)
☐ Section 11.0	Centrifugal Compressor Affected Facility (NSPS, Subpart OOOO)[2]
☐ Section 12.0	Reciprocating Compressor Affected Facility (NSPS, Subpart OOOO)[2]
☒ Section 13.0	Reciprocating Internal Combustion Engines, Generator Engines, Microturbines
☒ Section 14.0	Tanker Truck Loading[3]
☐ Section 15.0	Glycol Dehydration Units[4]

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

2 *Applicants that are subject to Section 11 and 12 may also be subject to the applicable RICE requirements of Section 13.*

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

4 *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	E001	Line Heater	2014	2014	1.54 MMBtu/hr	Existing; No change	None	---
S002	E002	Line Heater	2014	2014	1.54 MMBtu/hr	Existing; No change	None	---
S003	E003	Line Heater	2014	2014	1.54 MMBtu/hr	Existing; No change	None	---
S004	E004	Line Heater	2014	2014	1.54 MMBtu/hr	Existing; No change	None	---
S005	E005	Line Heater	2014	2014	1.54 MMBtu/hr	Existing; No change	None	---
S006	E006	Line Heater	2014	2014	1.54 MMBtu/hr	Existing; No change	None	---
S007	E007	Line Heater	2014	2014	1.54 MMBtu/hr	Existing; No change	None	---
S008	C017 – C018	Produced Fluid Storage Tank	2014	2014	400 bbl	Existing; No change	C017 – C018	---
S009	C017 – C018	Produced Fluid Storage Tank	2014	2014	400 bbl	Existing; No change	C017 – C018	---
S010	C017 – C018	Produced Fluid Storage Tank	2014	2014	400 bbl	Existing; No change	C017 – C018	---
S011	C017 – C018	Produced Fluid Storage Tank	2014	2014	400 bbl	Existing; No change	C017 – C018	---
S012	C017 – C018	Produced Fluid Storage Tank	2014	2014	400 bbl	Existing; No change	C017 – C018	---
S013	C017 – C018	Produced Fluid Storage Tank	2014	2014	400 bbl	Existing; No change	C017 – C018	---
S014	C017 – C018	Produced Fluid Storage Tank	2014	2014	400 bbl	Existing; No change	C017 – C018	---

S015	C017 – C018	Produced Fluid Storage Tank	2014	2014	400 bbl	Existing; No change	C017 – C018	---
S016	E016 (Uncaptured) C017–C018 (Controlled, Captured)	Liquid Loading	2014	2014	30,987,864 gal/yr	Modified; Increase throughput	C017 – C018	---
S019	E019	Thermoelectric Generator	2014	2014	0.013 MMBtu/hr	Existing; No change	C001 – C002	---
S020	E020	Thermoelectric Generator	2014	2014	0.013 MMBtu/hr	Existing; No change	C001 – C002	---
S021	E021	Line Heater	TBD	TBD	1.15 MMBtu/hr	New	None	---
S022	E022	Sand Separator Storage Tank	TBD	TBD	140 bbl	New	C017 – C018 (Optional)	---
S023	E023	VRU Engine	TBD	TBD	110 hp	New	None	---
C017	C017	Tank Combustor	2014	2014	11.66 MMBtu/hr	Existing; No change	NA	---
C018	C018	Tank Combustor	2014	2014	11.66 MMBtu/hr	Existing; No change	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 4.1.4. of the G70-B	☐ 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 (CO_2e)
Pumps	☐ Yes ☒ No	14	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	2.59	0.11	0.50
Valves	☐ Yes ☒ No	408	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	3.35	0.14	41.17
Safety Relief Valves	☐ Yes ☒ No	30	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	4.30	0.18	4.49
Open Ended Lines	☐ Yes ☒ No	30	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	2.9E-03	6.84
Sampling Connections	☐ Yes ☐ No	0	N/A	☐ Gas ☐ Liquid ☐ Both	---	---	---
Connections (Not sampling)	☐ Yes ☒ No	1,809	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	4.56	0.19	20.28
Compressors	☐ Yes ☒ No	1	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	0.31	0.01	15.59
Flanges	☐ Yes ☐ No	---	(included in connections)	☐ Gas ☐ Liquid ☐ Both	---	---	---
Other[1]	☐ Yes ☒ No	35	40 CFR 98 Subpart W	☒ Gas ☐ Liquid ☐ Both	5.19	0.22	588.69

[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 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
047-017-06381	June 2015	June 2015	Green
047-017-06386	June 2015	June 2015	Green
047-017-06385	June 2015	June 2015	Green
047-017-06384	June 2015	June 2015	Green
047-017-06383	June 2015	June 2015	Green
047-017-06575	June 2015	June 2015	Green
047-017-06574	June 2015	June 2015	Green

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 WEU-51 Pad	2. Tank Name Produced Fluid Tanks (water and condensate)
3. Emission Unit ID number S008-S015	4. Emission Point ID number C017-C018
5. Date Installed , Modified or Relocated *(for existing tanks)* Was the tank manufactured after August 23, 2011? ☒ Yes ☐ No	6. Type of change: N/A ☐ 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.
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 – Cashco Lockdown Hatch
[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 WEU-51 Pad	2. Tank Name Sand Separator Tank
3. Emission Unit ID number S022	4. Emission Point ID number E022
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 compressor station. 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]
S001	E001	Line Heater	2014	Existing; No change	1.54	~1,217
S002	E002	Line Heater	2014	Existing; No change	1.54	~1,217
S003	E003	Line Heater	2014	Existing; No change	1.54	~1,217
S004	E004	Line Heater	2014	Existing; No change	1.54	~1,217
S005	E005	Line Heater	2014	Existing; No change	1.54	~1,217
S006	E006	Line Heater	2014	Existing; No change	1.54	~1,217
S007	E007	Line Heater	2014	Existing; No change	1.54	~1,217
S019	E019	Thermoelectric Generator	2014	Existing; No change	0.013	~1,217
S020	E020	Thermoelectric Generator	2014	Existing; No change	0.013	~1,217
S021	E021	Line Heater	TBD	New	1.15	~1,217

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

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]	S023		
Engine Manufacturer/Model	Ford CSG-637		
Manufacturers Rated bhp/rpm	110		
Source Status[2]	NS		
Date Installed/ Modified/Removed/Relocated[3]	TBD		
Engine Manufactured /Reconstruction Date[4]	> July 2010		
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	110		
BSFC (BTU/bhp-hr)	7,000		
Hourly Fuel Throughput	733 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)	6.4 $MMft^3$/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]**
	NO_x	0.24	1.06				
	CO	0.49	2.12				
	VOC	0.19	0.81				
	SO_2	<0.01	<0.01				
	PM_{10}	0.01	0.07				
	Formaldehyde	0.02	0.07				
	Total HAPs	0.02	0.11				
	GHG (CO_2e)	90	395				

1 Enter the appropriate Source Identification Number for each natural gas-fueled reciprocating internal combustion compressor/generator engine located at the compressor station. Multiple compressor 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# S023, use extra pages as necessary)

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

☒ 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: Ford	Model #: CSG-637
Design Operating Temperature: 1,600 °F	Design gas volume: scfm
Service life of catalyst: 5,000 hours	Provide manufacturer data? ☐Yes ☐ No
Volume of gas handled: 444.9 acfm at 1,600 °F	Operating temperature range for NSCR/Ox Cat: From °F to °F
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)?
5,000 hours

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
Per 40 CFR §60.4243(a)(1), EQT must maintain the certified engine and control device according to the manufacturer's emission related written instructions and keep records of conducted maintenance to demonstrate compliance, but no performance testing is required.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2015 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **Engine Distributors, Inc.**
(U.S. Manufacturer or Importer)

Certificate Number: FEDIB03.7CSG-006

Effective Date: 06/08/2015

Expiration Date: 12/31/2015

Byron J. Bunker, Division Director
Compliance Division

Issue Date: 06/08/2015

Revision Date: N/A

Manufacturer: Engine Distributors, Inc.
Engine Family: FEDIB03.7CSG
Mobile/Stationary Certification Type: Mobile and Stationary
Fuel : LPG/Propane
Gasoline (up to and including 10% Ethanol)
Natural Gas (CNG/LNG)
Emission Standards :
Mobile Part 1048
HC + NOx (g/kW-hr) : 0.8
NMHC + NOx (g/kW-hr) : 0.8
CO (g/kW-hr) : 20.6
Part 60 Subpart JJJ Table 1
NOx (g/kW-hr) : 1.3
HC + NOx (g/kW-hr) : 0.8
CO (g/kW-hr) : 2.7
CO (g/kW-hr) : 20.6
VOC (g/kW-hr) : 0.9
Emergency Use Only : N

Pursuant to Section 213 of the Clean Air Act (42 U.S.C. section 7547) and 40 CFR Part 60, 40 CFR Part 1048, 1065, 1068, and 60 (stationary only and combined stationary and mobile) and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following nonroad engines, by engine family, more fully described in the documentation required by 40 CFR Part 60, 40 CFR Part 1048 and produced in the stated model year.

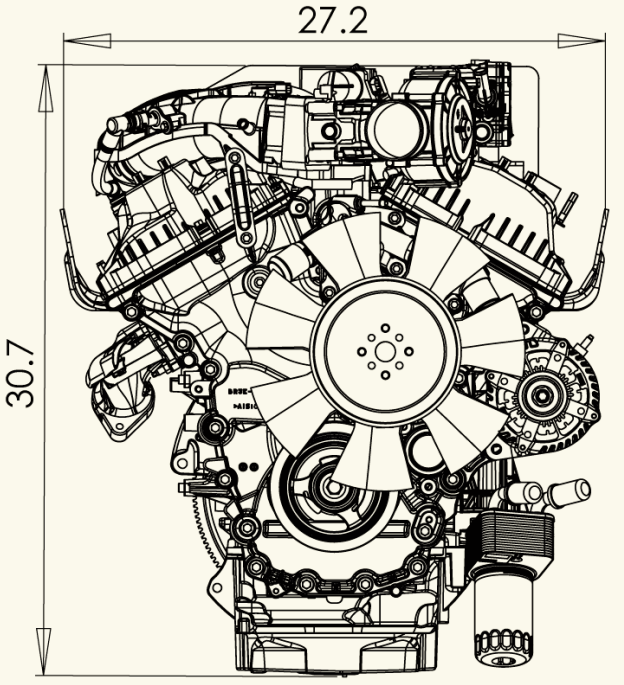
This certificate of conformity covers only those new nonroad spark-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60, 40 CFR Part 1048 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60, 40 CFR Part 1048. This certificate of conformity does not cover nonroad engines imported prior to the effective date of the certificate.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068.20 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60, 40 CFR Part 1048. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60, 40 CFR Part 1048.

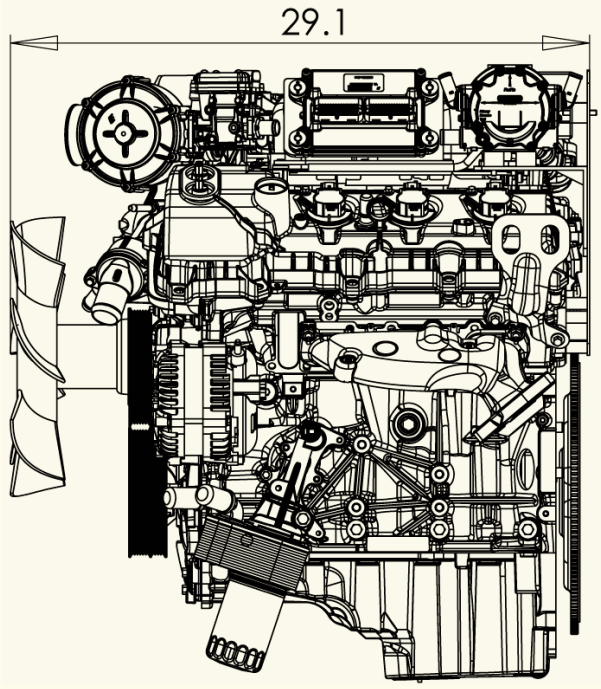
This certificate does not cover large nonroad engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

Installation Drawings

Front End View

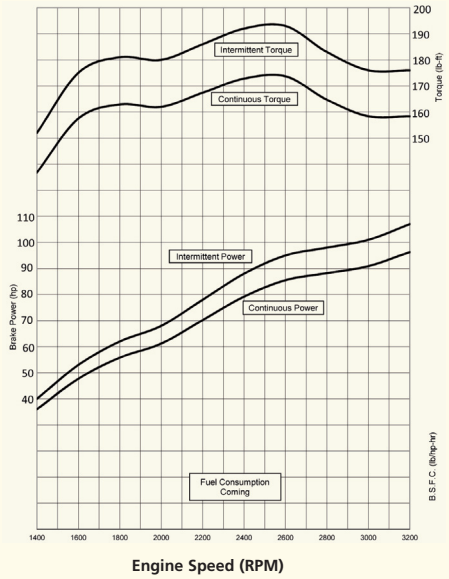


Left Side View

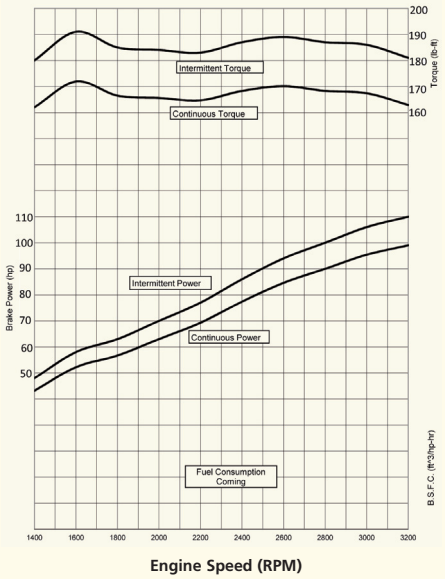


Power Curves (corrected per SAE J1349)

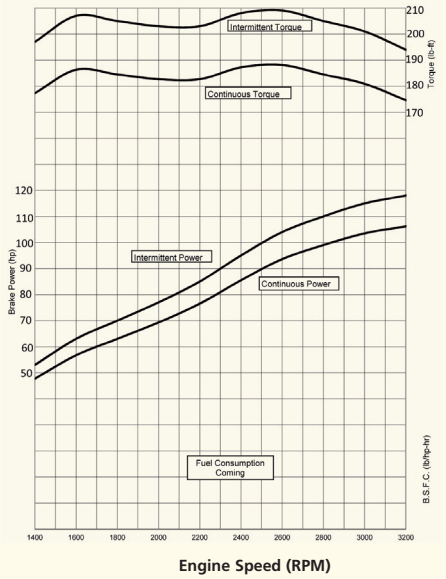
Gasoline



Natural Gas



Liquefied Petroleum Gas



Ford Power Products

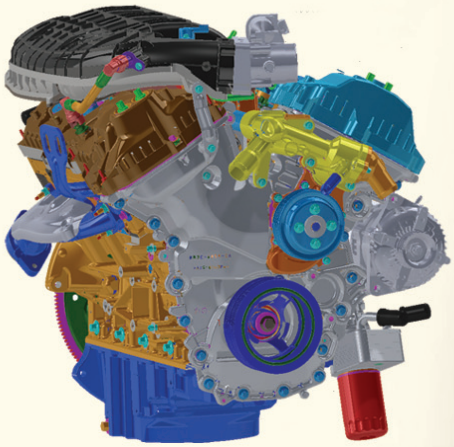
Powertrain Assemblies & Components Provided By Ford Component Sales

For additional information Contact:

ENGINE DISTRIBUTORS INC.
400 University Ct • Blackwood NJ 08012
856/228-7298 • Fax:856/228-5531
www.edi-dist.com

CSG-637 EFI

3.7 Liter
6-Cylinder



Options

Engine Cooling Fans
- 14" (355mm) diameter suction
- 14" (355mm) diameter pusher

Flywheels
- 11.5" (292mm) SAE over-center clutch
- flat face flywheel

Flywheel Housings
- SAE #3

Exhaust Manifold
- rear dump down

Power Steering Pump
Air Conditioning
Wiring Harnesses
Discrete Speed Switch
Variable Speed Hand Throttle
Variable Speed Foot Pedal
Engine Mounts
- Automotive with insulators
- Open power unit

Electronic Instrument Panel, Gauges
Three Way Catalyst / Muffler Standard

Transmissions

6R80 electronic shift

Emissions Information

California Air Resources Board (CARB)
Environmental Protection Agency (EPA)
Emission Certified Packages

Warranty

Contact Engine Distributors, Inc
for warranty details.

Power Products

Powertrain Assemblies
& Components
Provided By Ford
Component Sales

Specifications

Engine Type	V-6
Bore and Stroke	3.7"x 3.4" (94mm x 86mm)
Displacement	3.7L Liter (225.7 CID)
Compression Ratio	10.5:1
Oil Capacity	6 qts. including filter
Net Weight	355 Lbs. with accessories (161 Kgs.)
Dimensions	L 25.4" x W 29.5" x H 29.4" (646 mm x 751 mm x 748 mm)

Gasoline (corrected per SAE J1349)

Unleaded 87 or 89 octane

Intermittent Power	107 [HP] @ 3200rpm	(80 [kW] @ 3200rpm)
Continuous Power	96 [HP] @ 3200rpm	(72 [kW] @ 3200rpm)
Intermittent Torque	193 [ft-lbs] @ 2600rpm	(261 [N-m] @ 2600rpm)
Continuous Torque	173 [ft-lbs] @ 2600rpm	(235 [N-m] @ 3200rpm)

Natural Gas (corrected per SAE J1349)

Fuel Specification	1050 BTU/FT3	
Intermittent Power	110 [HP] @ 3200rpm	(82 [kW] @ 3200rpm)
Continuous Power	99 [HP] @ 3200rpm	(74 [kW] @ 3200rpm)
Intermittent Torque	191 [ft-lbs] @1600rpm	(259 [N-m] @ 1600rpm)
Continuous Torque	172 [ft-lbs] @1600rpm	(233 [N-m] @ 1600rpm)

Liquefied Petroleum Gas (corrected per SAE J1349)

Fuel Specification	HD-5	
Intermittent Power	118 [HP] @ 3200rpm	(88 [kW] @ 3200rpm)
Continuous Power	106 [HP] @ 3200rpm	(79 [kW] @ 3200rpm)
Intermittent Torque	209 [ft-lbs] @ 2600rpm	(284 [N-m] @ 2600rpm)
Continuous Torque	188 [ft-lbs] @ 2600rpm	(255 [N-m] @ 2600rpm)

Standard Features / Benefits

Set-for-life valvetrain

Deep skirted, ribbed cylinder block casting for rigidity

150 AMP Alternator

Aluminum cylinder block and heads.

Chain driven dual camshafts with automatic tensioning system

Structural front cover and deep sump oil pan

Alternate fuel ready valvetrain components

Individual coil on plug electronic ignition

Four main bolts with side bolts through block for strength and durability

Gasoline Sequential Port Fuel Injection

Closed loop fuel control for all fuels

Electronic engine management system with built-in engine protection against detonation, high coolant temperature, low oil pressure, over speed shutdown and starter lockout

Next generation governing – discrete speeds, variable speeds, drive by wire – using the highest quality components.

Variable CAM Timing for intake camshafts - advances or retards timing to maximize engine power and fuel efficiency

Forged steel crankshaft

ATTACHMENT O

Truck Loading Data Sheet

ATTACHMENT O – TANKER TRUCK 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. Use extra pages if necessary.

Truck Loadout Collection Efficiencies

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

- For tanker trucks passing the MACT level annual leak test – 99.2%
- For tanker trucks passing the NSPS level annual leak test – 98.7%
- For tanker trucks 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 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#: S016	Emission Point ID#: C017-C018, E016	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 loading at one (1) time: 1
Are tanker trucks 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 loadout systems utilized? ☐ Closed System to tanker truck passing a MACT level annual leak test? ☐ Closed System to tanker truck passing a NSPS level annual leak test? ☒ Closed System to tanker truck 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:	Reboiler Design Heat Input
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.
☐ None of the above: Still vent emissions are controlled by an enclosed combustor

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)

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 compressor station 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 *(Not Applicable)*

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?

☐ 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?

☐ Yes ☒ No

Please list approximate number.

ATTACHMENT R

Air Pollution Control Device Data Sheet

ATTACHMENT R – 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#: **C017-C018 (existing; no change)**	Installation Date: 2014 ☐ New ☐ Modified ☐ Relocated
Maximum Rated Total Flow Capacity ~7,849 scfh 188,380 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# S008-S015, S016, S022 (optional)

Emission Unit ID#	Emission Source Description	Emission Unit ID#	Emission Source Description
S008-S015	Produced Fluid Tanks		
S016	Liquid Loading		
S022	Sand Separator Tank (optional)		

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

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

Pilot Gas Information

Number of Pilot Lights	Fuel Flow Rate to Pilot Flame per Pilot	Heat Input per Pilot	Will automatic re-ignition be used?
1	~50 scfh	0.05 MMBTU/hr	☐ 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#: S023	Installation Date: TBD ☒ New ☐ Modified ☐ Relocated

Device Information

Manufacturer: Ford
Model: CSG-637

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.

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		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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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:

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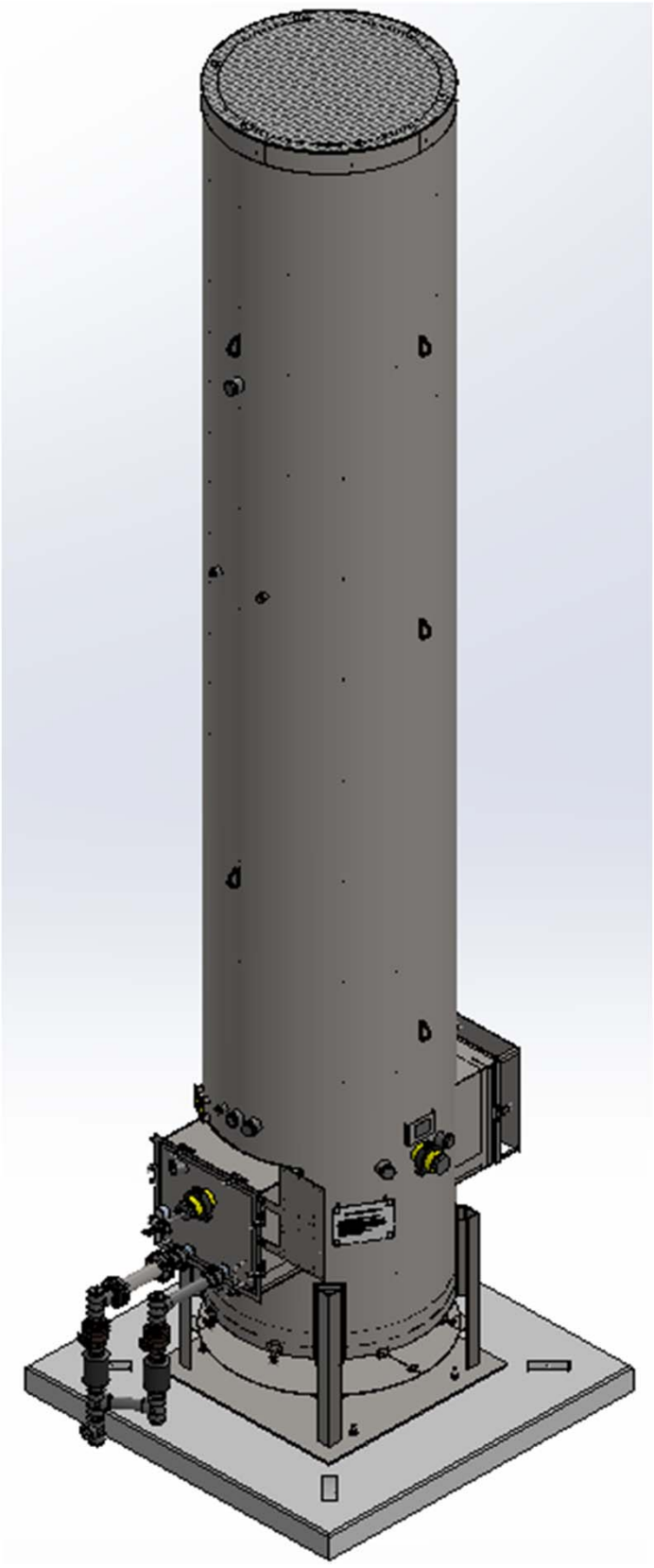
Site:				Supplier:	LEED FABRICATION		
Unit/Lease:		Remarks:	-	Model No.:	L30-0011-00		

GENERAL ARRANGEMENT



§ MMBTU/hr values are calculated based on 1500 BTU/scf gas

Flare Size	# of Orifices (N)	Pressure (OZ/in^2)	m^3/s	mSCFD	MMBTU/hr
18	2	1	0.0021	6.34	0.39
18	2	2	0.0029	8.97	0.56
18	2	3	0.0036	10.99	0.68
18	2	4	0.0042	12.69	0.78
18	2	5	0.0046	14.18	0.88
18	2	6	0.0051	15.54	0.96
18	2	7	0.0055	16.78	1.04
18	2	8	0.0059	17.94	1.11
18	2	9	0.0062	19.03	1.18
18	2	10	0.0066	20.06	1.24
18	2	11	0.0069	21.04	1.30
18	2	12	0.0072	21.97	1.36
18	2	13	0.0075	22.87	1.42
18	2	14	0.0078	23.73	1.47
18	2	15	0.0081	24.57	1.52
18	2	16	0.0083	25.37	1.57
18	2	17	0.0086	26.15	1.62
18	2	18	0.0088	26.91	1.67
24	4	1	0.0042	12.69	0.78
24	4	2	0.0059	17.94	1.11
24	4	3	0.0072	21.97	1.36
24	4	4	0.0083	25.37	1.57
24	4	5	0.0093	28.37	1.76
24	4	6	0.0102	31.08	1.92
24	4	7	0.0110	33.56	2.08
24	4	8	0.0118	35.88	2.22
24	4	9	0.0125	38.06	2.35
24	4	10	0.0131	40.12	2.48
24	4	11	0.0138	42.08	2.60
24	4	12	0.0144	43.95	2.72
24	4	13	0.0150	45.74	2.83
24	4	14	0.0156	47.47	2.94
24	4	15	0.0161	49.13	3.04
24	4	16	0.0166	50.75	3.14
24	4	17	0.0171	52.31	3.24
24	4	18	0.0176	53.82	3.33
36	10	1	0.0104	31.72	1.96
36	10	2	0.0147	44.85	2.78
36	10	3	0.0180	54.93	3.40

36	10	4	0.0208	63.43	3.92
36	10	5	0.0232	70.92	4.39
36	10	6	0.0255	77.69	4.81
36	10	7	0.0275	83.91	5.19
36	10	8	0.0294	89.71	5.55
36	10	9	0.0312	95.15	5.89
36	10	10	0.0329	100.29	6.21
36	10	11	0.0345	105.19	6.51
36	10	12	0.0360	109.87	6.80
36	10	13	0.0375	114.35	7.08
36	10	14	0.0389	118.67	7.34
36	10	15	0.0403	122.83	7.60
36	10	16	0.0416	126.86	7.85
36	10	17	0.0429	130.77	8.09
36	10	18	0.0441	134.56	8.33
48	14	1	0.0146	44.40	2.75
48	14	2	0.0206	62.79	3.89
48	14	3	0.0252	76.91	4.76
48	14	4	0.0291	88.80	5.49
48	14	5	0.0325	99.29	6.14
48	14	6	0.0356	108.76	6.73
48	14	7	0.0385	117.48	7.27
48	14	8	0.0412	125.59	7.77
48	14	9	0.0437	133.21	8.24
48	14	10	0.0460	140.41	8.69
48	14	11	0.0483	147.27	9.11
48	14	12	0.0504	153.81	9.52
48	14	13	0.0525	160.09	9.91
48	14	14	0.0545	166.14	10.28
48	14	15	0.0564	171.97	10.64
48	14	16	0.0582	177.61	10.99
48	14	17	0.0600	183.07	11.33
48	14	18	0.0617	188.38	11.66

ATTACHMENT S

Emission Calculations

Company Name: EQT Production, LLC
Facility Name: WEU51 Wellpad
Project Description: G70-B Application

Facility-Wide Emission Summary - Controlled

Wells	7	per pad
Storage Tanks	8	per pad
Sand Separator Tank	1	per pad
Line Heaters	8	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	1	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	900	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}		$PM_{2.5}$		CO_2e	
			lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
C017-C018	S008 - S015	Storage Vessels	---	---	---	---	0.24	1.06	---	---	---	---	---	---	6.26	27.41
C017-C018	S016	Captured Liquid Loading	---	---	---	---	1.80	0.47	---	---	---	---	---	---	---	---
C017	C017	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	1,371.10	6,005.43
C018	C018	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	1,371.10	6,005.43
C017	**S008 - S016, C017**	**---**	**1.15**	**5.03**	**0.96**	**4.22**	**1.02**	**0.77**	**0.01**	**0.03**	**0.09**	**0.38**	**0.09**	**0.38**	**1,374.23**	**6,019.14**
C018	**S008 - S016, C018**	**---**	**1.15**	**5.03**	**0.96**	**4.22**	**1.02**	**0.77**	**0.01**	**0.03**	**0.09**	**0.38**	**0.09**	**0.38**	**1,374.23**	**6,019.14**
E001	S001	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	180.18	789.20
E002	S002	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	180.18	789.20
E003	S003	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	180.18	789.20
E004	S004	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	180.18	789.20
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	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	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	180.18	789.20
E021	S021	Line Heater	0.11	0.48	0.09	0.40	0.01	0.03	6.6E-04	2.9E-03	0.01	0.04	0.01	0.04	135.14	591.90
E019	S019	TEG	1.2E-03	5.4E-03	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	1.52	6.64
E020	S020	TEG	1.2E-03	5.4E-03	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	1.52	6.64
E022	S022	Sand Separator Tank	---	---	---	---	0.04	0.17	---	---	---	---	---	---	0.45	2.03
E023	S023	VRU Engine	0.24	1.06	0.49	2.12	0.19	0.81	4.5E-04	2.0E-03	0.01	0.07	0.01	0.07	90.18	394.99
E016	S016	Uncaptured Liquid Loading	---	---	---	---	38.59	10.03	---	---	---	---	---	---	---	---
---	---	Fugitives	---	---	---	---	---	20.38	---	---	---	---	---	---	---	677.56
---	---	Haul Roads	---	---	---	---	---	---	---	---	---	1.45	---	0.15	---	---
Facility Total			3.68	16.11	3.37	14.76	40.92	33.20	0.02	0.09	0.28	2.66	0.28	1.35	4,238.54	19,242.41
Facility Total (excluding fugitive emissions)			3.68	16.11	3.37	14.76	2.33	2.79	0.02	0.09	0.28	1.21	0.28	1.21	4,238.54	18,564.85

1. Emissions routed to combustors are divided evenly by the total number of combustors (i.e., Combustor Point Emissions = [storage tanks emissions + captured loading emissions] / [number of combustors] + combustor emissions). However, emissions can be routed to either combustor.

Company Name: EQT Production, LLC
Facility Name: WEU51 Wellpad
Project Description: G70-B Application

Facility-Wide Emission Summary - Controlled

Emission Point ID #	Emission Source ID#s	Emission Source Description	Formaldehyde		Benzene		Toluene		Ethylbenzene		Xylenes		n-Hexane		Total HAP	
			lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
C017-C018	S008 - S015	Storage Vessels	---	---	2.8E-04	1.2E-03	3.8E-04	1.7E-03	3.0E-07	1.3E-06	3.9E-04	1.7E-03	4.8E-03	0.02	0.01	0.03
C017-C018	S016	Captured Liquid Loading	---	---	1.5E-03	3.9E-04	1.0E-03	2.7E-04	7.4E-07	1.9E-07	9.1E-04	2.4E-04	0.03	0.01	0.05	0.01
C017	C017	Tank Combustor	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C018	C018	Tank Combustor	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C017	**S008 - S016, C017**	**---**	---	---	**9.0E-04**	**8.1E-04**	**7.1E-04**	**9.7E-04**	**5.2E-07**	**7.5E-07**	**6.5E-04**	**9.7E-04**	**0.02**	**0.01**	**0.03**	**0.02**
C018	**S008 - S016, C018**	**---**	---	---	**9.0E-04**	**8.1E-04**	**7.1E-04**	**9.7E-04**	**5.2E-07**	**7.5E-07**	**6.5E-04**	**9.7E-04**	**0.02**	**0.01**	**0.03**	**0.02**
E001	S001	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	2.8E-03	0.01
E002	S002	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	2.8E-03	0.01
E003	S003	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	2.8E-03	0.01
E004	S004	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	2.8E-03	0.01
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	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	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	2.8E-03	0.01
E021	S021	Line Heater	8.2E-05	3.6E-04	2.3E-06	1.0E-05	3.7E-06	1.6E-05	---	---	---	---	2.0E-03	0.01	2.1E-03	0.01
E019	S019	TEG	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
E020	S020	TEG	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
E022	S022	Sand Separator Tank	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.0E-03	<0.01	2.0E-03	1.0E-02
E023	S023	VRU Engine	0.02	0.07	1.2E-03	0.01	4.3E-04	1.9E-03	1.9E-05	8.4E-05	1.5E-04	6.6E-04	---	---	0.02	0.11
E016	S016	Uncaptured Liquid Loading	---	---	0.03	0.01	0.02	0.01	1.6E-05	4.1E-06	0.02	0.01	0.75	0.19	0.99	0.26
---	---	Fugitives	---	---	---	0.01	---	0.03	---	<0.01	---	0.03	---	0.30	---	0.84
---	---	Haul Roads	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Facility Total			0.02	0.07	0.04	0.03	0.02	0.04	3.6E-05	8.9E-05	0.02	0.04	0.81	0.62	1.10	1.36
Facility Total (excluding fugitive emissions)			0.02	0.07	3.0E-03	0.01	1.9E-03	4.0E-03	2.0E-05	8.5E-05	1.5E-03	2.6E-03	0.06	0.12	0.10	0.26

1. Emissions routed to combustors are divided evenly by the total number of combustors (i.e., Combustor Point Emissions = [storage tanks emissions + captured loading emissions] / [number of combustors] + combustor emissions). However, emissions can be routed to either combustor.

Company Name: EQT Production, LLC
Facility Name: WEU51 Wellpad
Project Description: G70-B Application

Produced Fluids Storage Vessels

Potential Throughput

Operational Hours	8,760	hrs/yr
Maximum Condensate Throughput[1]	6,144	bbl/month
Maximum Produced Water Throughput[1]	55,322	bbl/month

[1] Based on the highest monthly throughput recorded at the site (July 2015). Includes a safety factor of 20%.
Overall Control Efficiency of Combustor 98%

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	12.516	54.819	12.516	54.819
Ethane	<0.001	<0.001	<0.001	<0.001	7.660	33.550	7.660	33.550
Propane	0.067	0.295	1.162	5.090	5.356	23.460	6.586	28.845
Isobutane	0.013	0.058	0.193	0.845	0.970	4.247	1.176	5.150
n-Butane	0.024	0.104	0.352	1.541	1.902	8.332	2.278	9.977
Isopentane	0.007	0.032	0.105	0.462	0.544	2.383	0.657	2.876
n-Pentane	0.006	0.026	0.086	0.377	0.451	1.974	0.543	2.377
n-Hexane	0.003	0.012	0.038	0.167	0.197	0.864	0.238	1.042
Cyclohexane	1.3E-04	0.001	0.002	0.009	0.016	0.069	0.018	0.078
Methylcyclopentane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
n-Heptane	0.002	0.009	0.031	0.136	0.172	0.756	0.206	0.901
n-Octane	3.4E-04	0.001	0.005	0.022	0.028	0.122	0.033	0.145
n-Nonane	1.6E-04	0.001	0.002	0.010	0.014	0.061	0.016	0.072
n-Decane	3.6E-04	0.002	0.005	0.023	0.032	0.140	0.038	0.165
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	0.002	0.010	0.033	0.143	0.168	0.734	0.203	0.887
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	3.9E-05	1.7E-04	0.002	0.009	0.012	0.052	0.014	0.061
Toluene	5.3E-05	2.3E-04	0.001	0.006	0.018	0.077	0.019	0.083
Ethylbenzene	4.9E-08	2.1E-07	8.5E-07	3.7E-06	1.4E-05	6.2E-05	1.5E-05	6.6E-05
m-Xylene	6.1E-05	2.7E-04	0.001	0.005	0.018	0.081	0.020	0.086
Isooctane	0.001	0.003	0.009	0.039	0.048	0.209	0.057	0.251
Total VOC Emissions:	0.13	0.55	2.03	8.88	9.95	43.56	12.10	53.00
Total HAP Emissions:	3.4E-03	0.01	0.05	0.22	0.29	1.28	0.35	1.52

[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 WEU-51 sample from 6/22/2015.

Company Name: EQT Production, LLC
Facility Name: WEU51 Wellpad
Project Description: G70-B 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	0.250	1.096	0.250	1.096
Ethane	<0.001	<0.001	<0.001	<0.001	0.153	0.671	0.153	0.671
Propane	0.001	0.006	0.023	0.102	0.107	0.469	0.132	0.577
Isobutane	2.7E-04	0.001	0.004	0.017	0.019	0.085	0.024	0.103
n-Butane	4.8E-04	0.002	0.007	0.031	0.038	0.167	0.046	0.200
Isopentane	1.5E-04	0.001	0.002	0.009	0.011	0.048	0.013	0.058
n-Pentane	1.2E-04	0.001	0.002	0.008	0.009	0.039	0.011	0.048
n-Hexane	5.3E-05	2.3E-04	0.001	0.003	0.004	0.017	0.005	0.021
Cyclohexane	2.7E-06	1.2E-05	3.9E-05	1.7E-04	3.1E-04	0.001	3.6E-04	0.002
Methylcyclopentane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
n-Heptane	4.3E-05	1.9E-04	0.001	0.003	0.003	0.015	0.004	0.018
n-Octane	6.8E-06	3.0E-05	9.8E-05	4.3E-04	0.001	0.002	0.001	0.003
n-Nonane	3.2E-06	1.4E-05	4.6E-05	2.0E-04	2.8E-04	0.001	3.3E-04	0.001
n-Decane	7.2E-06	3.1E-05	1.0E-04	4.5E-04	0.001	0.003	0.001	0.003
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	4.5E-05	2.0E-04	0.001	0.003	0.003	0.015	0.004	0.018
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	7.8E-07	3.4E-06	4.3E-05	1.9E-04	2.4E-04	0.001	2.8E-04	0.001
Toluene	1.1E-06	4.6E-06	2.6E-05	1.1E-04	3.5E-04	0.002	3.8E-04	0.002
Ethylbenzene	9.8E-10	4.3E-09	1.7E-08	7.4E-08	2.8E-07	1.2E-06	3.0E-07	1.3E-06
m-Xylene	1.2E-06	5.4E-06	2.1E-05	9.2E-05	3.7E-04	0.002	3.9E-04	0.002
Isooctane	1.2E-05	5.4E-05	1.8E-04	0.001	0.001	0.004	0.001	0.005
Total VOC Emissions:	2.5E-03	0.01	0.04	0.18	0.20	0.87	0.24	1.06
Total HAP Emissions:	6.8E-05	3.0E-04	1.0E-03	4.5E-03	5.9E-03	0.03	0.01	0.03

Company Name: EQT Production, LLC
Facility Name: WEU51 Wellpad
Project Description: G70-B Application

VRU Engine

Engine Information:

Manufacturer:	Ford
Model No.:	CSG-637
Engine ID	S023
Stroke Cycle:	4-stroke
Type of Burn:	Rich
Rated Horsepower (bhp):	110

Engine Fuel Information:

Fuel Type:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,050
Specific Fuel Consumption (Btu/bhp-hr):	7,000
Maximum Fuel Consumption at 100% Load (scf/hr):	733
Heat Input (MMBtu/hr):	0.77
Potential Fuel Consumption (MMBtu/yr):	6,745
Max. Fuel Consumption at 100%(MMscf/hr):	0.0007
Max. Fuel Consumption (MMscf/yr):	6.4
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	1.0	g/bhp-hr	0.24	1.06	Manufacturer
VOC (excludes HCHO)	0.7	g/bhp-hr	0.17	0.74	Manufacturer
VOC (includes HCHO)	---	---	0.19	0.81	VOC + HCHO
CO	2.0	g/bhp-hr	0.49	2.12	Manufacturer
SO_X	0.001	lb/MMBtu	4.5E-04	2.0E-03	AP-42, Table 3.2-3 (Aug-2000)
PM_{10}	0.02	lb/MMBtu	0.01	0.07	AP-42, Table 3.2-3 (Aug-2000)
$PM_{2.5}$	0.02	lb/MMBtu	0.01	0.07	AP-42, Table 3.2-3 (Aug-2000)
Formaldehyde (HCHO)	0.02	lb/MMBtu	0.02	0.07	AP-42, Table 3.2-3 (Aug-2000)
GHG (CO_2e)	See Table Below		90	395	40 CFR 98, Tables C-1 & C-2
Other (Total HAP)	See Table Below		0.02	0.11	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: WEU51 Wellpad
Project Description: G70-B 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	53.06	kg/MMBtu	90.09	394.59	40 CFR 98, Table C-1
CH_4	0.001	kg/MMBtu	1.7E-03	7.4E-03	40 CFR 98, Table C-2
N_2O	0.0001	kg/MMBtu	1.7E-04	7.4E-04	40 CFR 98, Table C-2
GHG (CO_2e)			**90**	**395**	
Organic HAPs:					
1,1,2,2-Tetrachloroethane	2.53E-05	lb/MMBtu	1.9E-05	8.5E-05	AP-42, Table 3.2-3 (Aug-2000)
1,1,2-Trichloroethane	1.53E-05	lb/MMBtu	1.2E-05	5.2E-05	AP-42, Table 3.2-3 (Aug-2000)
1,3-Butadiene	6.63E-04	lb/MMBtu	5.1E-04	2.2E-03	AP-42, Table 3.2-3 (Aug-2000)
1,3-Dichloropropene	1.27E-05	lb/MMBtu	9.8E-06	4.3E-05	AP-42, Table 3.2-3 (Aug-2000)
Acetaldehyde	2.79E-03	lb/MMBtu	2.1E-03	9.4E-03	AP-42, Table 3.2-3 (Aug-2000)
Acrolein	2.63E-03	lb/MMBtu	2.0E-03	8.9E-03	AP-42, Table 3.2-3 (Aug-2000)
Benzene	1.58E-03	lb/MMBtu	1.2E-03	5.3E-03	AP-42, Table 3.2-3 (Aug-2000)
Carbon Tetrachloride	1.77E-05	lb/MMBtu	1.4E-05	6.0E-05	AP-42, Table 3.2-3 (Aug-2000)
Chlorobenzene	1.29E-05	lb/MMBtu	9.9E-06	4.4E-05	AP-42, Table 3.2-3 (Aug-2000)
Chloroform	1.37E-05	lb/MMBtu	1.1E-05	4.6E-05	AP-42, Table 3.2-3 (Aug-2000)
Ethylbenzene	2.48E-05	lb/MMBtu	1.9E-05	8.4E-05	AP-42, Table 3.2-3 (Aug-2000)
Ethylene Dibromide	2.13E-05	lb/MMBtu	1.6E-05	7.2E-05	AP-42, Table 3.2-3 (Aug-2000)
Methanol	3.06E-03	lb/MMBtu	2.4E-03	1.0E-02	AP-42, Table 3.2-3 (Aug-2000)
Methylene Chloride	4.12E-05	lb/MMBtu	3.2E-05	1.4E-04	AP-42, Table 3.2-3 (Aug-2000)
Naphthalene	9.71E-05	lb/MMBtu	7.5E-05	3.3E-04	AP-42, Table 3.2-3 (Aug-2000)
PAH	1.41E-04	lb/MMBtu	1.1E-04	4.8E-04	AP-42, Table 3.2-3 (Aug-2000)
Styrene	1.19E-05	lb/MMBtu	9.2E-06	4.0E-05	AP-42, Table 3.2-3 (Aug-2000)
Toluene	5.58E-04	lb/MMBtu	4.3E-04	1.9E-03	AP-42, Table 3.2-3 (Aug-2000)
Vinyl Chloride	7.18E-06	lb/MMBtu	5.5E-06	2.4E-05	AP-42, Table 3.2-3 (Aug-2000)
Xylene	1.95E-04	lb/MMBtu	1.5E-04	6.6E-04	AP-42, Table 3.2-3 (Aug-2000)
Total HAP			**0.02**	**0.11**	

Company Name: EQT Production, LLC
Facility Name: WEU51 Wellpad
Project Description: G70-B Application

Sand Separator Tank

Throughput Parameter	Value	Units
Tank Capacity	5,880	gallons
Operational Hours	8,760	hrs/yr
Throughput	280	bbl/month
Percent Produced Water	50%	
Total Produced Water Throughput	140	bbl/month

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

Description	Potential Throughput (gal/yr)
Produced Water and Sand	141,120

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

Constituent	Total Emissions [1] lb/hr	tpy
Methane	0.018	0.081
Ethane	0.022	0.098
Propane	0.018	0.080
Isobutane	0.004	0.016
n-Butane	0.007	0.032
Isopentane	0.002	0.010
n-Pentane	0.002	0.009
Hexanes	<0.001	<0.001
Heptanes	0.001	0.005
Octane	<0.001	0.001
Nonane	<0.001	<0.001
Decane	0.003	0.015
Benzene	<0.001	<0.001
Toluene	<0.001	<0.001
Ethylbenzene	<0.001	<0.001
Xylenes	<0.001	<0.001
n-Hexane	0.001	0.006
2,2,4-Trimethylpentane	<0.001	<0.001
Total HC Emissions:	0.081	0.353
Total VOC Emissions:	0.040	0.174
Total HAP Emissions:	0.002	0.010

[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 WEU-51 sample from 6/22/2015.

Company Name: EQT Production, LLC
Facility Name: WEU51 Wellpad
Project Description: G70-B Application

Sand Separator Tank

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

Constituent	Total Emissions lb/hr	tpy
Methane	0.018	0.081
Ethane	0.022	0.098
Propane	0.018	0.080
Isobutane	0.004	0.016
n-Butane	0.007	0.032
Isopentane	0.002	0.010
n-Pentane	0.002	0.009
Hexanes	<0.001	<0.001
Heptanes	0.001	0.005
Octane	<0.001	0.001
Nonane	<0.001	<0.001
Decane	0.003	0.015
Benzene	<0.001	<0.001
Toluene	<0.001	<0.001
Ethylbenzene	<0.001	<0.001
Xylenes	<0.001	<0.001
n-Hexane	0.001	0.006
2,2,4-Trimethylpentane	<0.001	<0.001
Total Emissions:	0.083	0.363
Total VOC Emissions:	0.040	0.174
Total HAP Emissions:	0.002	0.010

Company Name: EQT Production, LLC
Facility Name: WEU51 Wellpad
Project Description: G70-B Application

Tank Combustors

Source Designation:	**C017 & C018**
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]	188.380
Combustor Rating (scf/hr)	7,849
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: $\frac{7849.17 \text{ scf}}{\text{hr}} \left| \frac{\text{lb-mol}}{379.5 \text{ scf}} \right| \frac{20.01 \text{ lb}}{\text{lb-mol}} = 413.81 \text{ lb/hr}$

Company Name: EQT Production, LLC
Facility Name: WEU51 Wellpad
Project Description: G70-B Application

Line Heaters

Source Designation:	**S001 - S007**
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]	Potential Emissions (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: WEU51 Wellpad
Project Description: G70-B 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: WEU51 Wellpad
Project Description: G70-B Application

Line Heater

Source Designation:	**S021**
Fuel Used:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,050
Heat Input (MMBtu/hr)	1.15
Fuel Consumption (MMscf/hr):	1.10E-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	0.11	0.48
CO	84	0.09	0.40
VOC	5.5	0.01	0.03
SO_2	0.6	6.6E-04	2.9E-03
PM Total	7.6	0.01	0.04
PM Condensable	5.7	0.01	0.03
PM_{10} (Filterable)	1.9	2.1E-03	0.01
$PM_{2.5}$ (Filterable)	1.9	2.1E-03	0.01
Lead	5.00E-04	5.5E-07	2.4E-06
CO_2	117.0	135.00	591.29
CH_4	2.21E-03	2.5E-03	1.1E-02
N_2O	2.21E-04	2.5E-04	1.1E-03

Company Name: EQT Production, LLC
Facility Name: WEU51 Wellpad
Project Description: G70-B Application

Line Heater

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	2.6E-08	1.2E-07
3-Methylchloranthrene	1.8E-06	2.0E-09	8.7E-09
7,12-Dimethylbenz(a)anthracene	1.6E-05	1.8E-08	7.7E-08
Acenaphthene	1.8E-06	2.0E-09	8.7E-09
Acenaphthylene	1.8E-06	2.0E-09	8.7E-09
Anthracene	2.4E-06	2.6E-09	1.2E-08
Benz(a)anthracene	1.8E-06	2.0E-09	8.7E-09
Benzene	2.1E-03	2.3E-06	1.0E-05
Benzo(a)pyrene	1.2E-06	1.3E-09	5.8E-09
Benzo(b)fluoranthene	1.8E-06	2.0E-09	8.7E-09
Benzo(g,h,i)perylene	1.2E-06	1.3E-09	5.8E-09
Benzo(k)fluoranthene	1.8E-06	2.0E-09	8.7E-09
Chrysene	1.8E-06	2.0E-09	8.7E-09
Dibenzo(a,h) anthracene	1.2E-06	1.3E-09	5.8E-09
Dichlorobenzene	1.2E-03	1.3E-06	5.8E-06
Fluoranthene	3.0E-06	3.3E-09	1.4E-08
Fluorene	2.8E-06	3.1E-09	1.3E-08
Formaldehyde	7.5E-02	8.2E-05	3.6E-04
Hexane	1.8E+00	2.0E-03	8.7E-03
Indo(1,2,3-cd)pyrene	1.8E-06	2.0E-09	8.7E-09
Naphthalene	6.1E-04	6.7E-07	2.9E-06
Phenanthrene	1.7E-05	1.9E-08	8.2E-08
Pyrene	5.0E-06	5.5E-09	2.4E-08
Toluene	3.4E-03	3.7E-06	1.6E-05
Arsenic	2.0E-04	2.2E-07	9.6E-07
Beryllium	1.2E-05	1.3E-08	5.8E-08
Cadmium	1.1E-03	1.2E-06	5.3E-06
Chromium	1.4E-03	1.5E-06	6.7E-06
Cobalt	8.4E-05	9.2E-08	4.0E-07
Manganese	3.8E-04	4.2E-07	1.8E-06
Mercury	2.6E-04	2.9E-07	1.3E-06
Nickel	2.1E-03	2.3E-06	1.0E-05
Selenium	2.4E-05	2.6E-08	1.2E-07
Total HAP		**2.1E-03**	**9.1E-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: WEU51 Wellpad
Project Description: G70-B Application

Thermoelectric Generators

Source Designation:	**S019 - S020**
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: WEU51 Wellpad
Project Description: G70-B 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: WEU51 Wellpad
Project Description: G70-B Application

Liquid Loading

Throughput 30,978,864 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	72.223	18.778	21.667	5.633	1.011	0.263
Isobutane	12.607	3.278	3.782	0.983	0.176	0.046
n-Butane	22.861	5.944	6.858	1.783	0.320	0.083
Isopentane	6.890	1.791	2.067	0.537	0.096	0.025
n-Pentane	5.627	1.463	1.688	0.439	0.079	0.020
n-Hexane	2.487	0.647	0.746	0.194	0.035	0.009
Cyclohexane	0.128	0.033	0.038	0.010	0.002	0.000
Methylcyclopentane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
n-Heptane	2.032	0.528	0.610	0.158	0.028	0.007
n-Octane	0.321	0.084	0.096	0.025	0.005	0.001
n-Nonane	0.150	0.039	0.045	0.012	0.002	0.001
n-Decane	0.339	0.088	0.102	0.026	0.005	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	2.136	0.555	0.641	0.167	0.030	0.008
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	0.108	0.028	0.032	0.008	0.002	0.000
Toluene	0.074	0.019	0.022	0.006	0.001	0.000
Ethylbenzene	0.000	0.000	0.000	0.000	0.000	0.000
m-Xylene	0.065	0.017	0.020	0.005	0.001	0.000
Isooctane	0.578	0.150	0.173	0.045	0.008	0.002
Total VOC Emissions:	128.625	33.443	38.588	10.033	1.801	0.468
Total HAP Emissions:	3.313	0.861	0.994	0.258	0.046	0.012

[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: WEU51 Wellpad
Project Description: G70-B 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	14	2.59	1.00	0.04	2.59	0.11
Compressor	Gas	0.22800	1	2.20	0.14	0.01	0.31	0.01
Valves	Gas	0.00597	408	23.52	0.14	0.01	3.35	0.14
Pressure Relief Valves	Gas	0.10400	30	30.13	0.14	0.01	4.30	0.18
Open-Ended Lines	All	0.00170	30	0.49	0.14	0.01	0.07	2.9E-03
Connectors	All	0.00183	1,809	31.97	0.14	0.01	4.56	0.19
Intermittent Pneumatic Devices[4]	Gas	13.5	35	---	---	---	5.19	0.22
			Emission Totals:	**90.90**	---	---	**20.38**	**0.84**

[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 are scf/unit/hr). 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: WEU51 Wellpad
Project Description: G70-B 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	14	2.59	2.0E-04	6.0E-04	<0.01	6.9E-04	0.01
Compressor	Gas	0.22800	1	2.20	1.7E-04	5.1E-04	<0.01	5.8E-04	0.01
Valves	Gas	0.00597	408	23.52	1.8E-03	0.01	<0.01	0.01	0.06
Pressure Relief Valves	Gas	0.10400	30	30.13	2.4E-03	0.01	<0.01	0.01	0.07
Open-Ended Lines	All	0.00170	30	0.49	3.8E-05	1.1E-04	<0.01	1.3E-04	1.2E-03
Connectors	All	0.00183	1,809	31.97	2.5E-03	0.01	<0.01	0.01	0.08
Intermittent Pneumatic Devices[4]	Gas	13.5	35	---	2.8E-03	0.01	<0.01	0.01	0.09
			Emission Totals:	**90.90**	**0.01**	**0.03**	**<0.01**	**0.03**	**0.30**

[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 are scf/unit/hr). 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	14	0.01	0.02	1.6E-04	0.50
Compressor	1	4.17	0.62	0.01	15.59
Valves	408	0.027	1.65	0.01	41.17
Pressure Relief Devices	30	0.04	0.18	1.5E-03	4.49
Open-Ended Lines	30	0.061	0.27	2.2E-03	6.84
Connectors	1,809	0.003	0.81	0.01	20.28
Intermittent Pneumatic Devices	35	13.5	23.54	0.19	588.69
Total			**27.09**	**0.22**	**677.56**

[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. Pneumatics assume 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: 81% CO_2: 0.24%

[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: **WEU51 Wellpad**
Project Description: **G70-B 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	0.17	7,745	2,640	0	5.65	1.44	0.14
Employee Vehicles	3	3	3	0.17	200	68	0	0.05	0.01	0.00
Total Potential Emissions								**5.71**	**1.45**	**0.15**

Company Name: **EQT Production, LLC**
Facility Name: **WEU51 Wellpad**
Project Description: **G70-B Application**

Gas Analysis

Sample Location: WEU-1 512507
Sample Date: 5/20/2013
HHV (Btu/scf): 1,217 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	0.240	44.01	0.11	0.01	0.528
Nitrogen	0.428	28.01	0.12	0.01	0.599
Methane	80.616	16.04	12.93	0.65	64.630
Ethane	13.296	30.07	4.00	0.20	19.983
Propane	3.541	44.10	1.56	0.08	7.805
Isobutane	0.426	58.12	0.25	0.01	1.237
n-Butane	0.746	58.12	0.43	0.02	2.167
Isopentane	0.191	72.15	0.14	0.01	0.689
n-Pentane	0.164	72.15	0.12	0.01	0.591
Cyclopentane	<0.001	70.1	0.0	0.0	0.000
n-Hexane	0.055	86.18	0.05	0.00	0.237
Cyclohexane	0.009	84.16	0.01	0.00	0.038
Other Hexanes	0.091	86.18	0.08	0.00	0.392
Heptanes	0.079	100.21	0.08	0.00	0.396
Methylcyclohexane	<0.001	98.19	0.00	0.00	0.000
2,2,4-Trimethylpentane	0.052	114.23	0.06	0.00	0.297
Benzene*	0.002	78.11	0.00	0.00	0.008
Toluene*	0.005	92.14	0.00	0.00	0.023
Ethylbenzene*	<0.001	106.17	0.00	0.00	0.000
Xylenes*	0.005	106.16	0.01	0.00	0.027
C8 + Heavies	0.054	130.80	0.07	0.00	0.353
Totals	100.000		20.01	1.00	100

TOC (Total)	99.33	98.87
VOC (Total)	5.42	14.26
HAP (Total)	0.12	0.59

Certificate of Analysis

Number: 2030-13050229-001A

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: 512507
Station Location: EQT Production
Cylinder No: GAS
Analyzed: 05/29/2013 11:21:20 by CC

Sampled By: GR-GAS
Sample Of: Gas Spot
Sample Date: 05/20/2013 12:00
Sample Conditions: 313 psig
Method: GPA 2286

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.73 psia
Nitrogen	0.428	0.599	
Carbon Dioxide	0.240	0.528	
Methane	80.616	64.659	
Ethane	13.296	19.989	3.567
Propane	3.541	7.807	0.978
Iso-Butane	0.426	1.238	0.140
n-Butane	0.746	2.168	0.236
Iso-Pentane	0.191	0.689	0.070
n-Pentane	0.164	0.592	0.060
i-Hexanes	0.091	0.381	0.037
n-Hexane	0.055	0.232	0.022
Benzene	0.002	0.009	0.001
Cyclohexane	0.009	0.038	0.003
i-Heptanes	0.056	0.267	0.024
n-Heptane	0.023	0.114	0.011
Toluene	0.005	0.023	0.002
i-Octanes	0.052	0.284	0.024
n-Octane	0.011	0.063	0.006
Ethylbenzene	NIL	NIL	NIL
Xylenes	0.005	0.026	0.002
i-Nonanes	0.024	0.149	0.012
n-Nonane	0.006	0.037	0.003
Decane Plus	0.013	0.108	0.009
	100.000	100.000	5.207

GPM TOTAL C2+ 5.207

Legacy Measurement Solutions

Tulsa, OK

918-827-5770

Customer	: 01 - LEGACY MEASUREMENT	**Date Sampled**	: 06/22/2015
Station Id	: 515730	**Date Analyzed**	: 07/08/2015
Cylinder Id	: 1	**Effective Date**	: 07/01/2015
Producer	: EQT PRODUCTION	**Line Pressure**	: 0.00000
Lease	: WEU 51 PAD	**Cyl Pressure**	: 717.00000
Area	: MGMD	**Temp**	: 0.00000
Sample By	: RM	**Cylinder Type**	: Spot
Property Cd	:	**Formation**	:

COMPONENT		Mole Percent	WT. Percent	Liq Vol Percent
Methane	C1	8.8113	1.2742	3.1443
Ethane	C2	6.2869	1.7040	3.5392
Propane	C3	4.6530	1.8495	2.6981
Iso-Butane	IC4	1.1065	0.5796	0.7619
Normal-Butane	NC4	2.8191	1.4770	1.8708
Iso-Pentane	IC5	1.4691	0.9555	1.1310
Normal-Pentane	NC5	1.7585	1.1437	1.3414
Nitrogen	N2	0.1010	0.0255	0.0228
Carbon-Dioxide	CO2	0.3385	0.1342	0.1209
BENZENE	BENZENE	0.0761	0.0536	0.0444
TOLUENE	TOLUENE	0.2811	0.2334	0.1974
ETHYLBENZENE	E-BENZENE	0.0012	0.0011	0.0006
O-XYLENE	O-XYLENE	1.0777	1.0314	0.8619
M-XYLENE/P-XYLENE	M-XYLENE/P-XYLENE	0.4450	0.4258	0.3621
C6's	C6's	4.3368	3.3687	3.7637
C7's	C7's	8.4614	10.2847	10.3591
C8's	C8's	4.7087	4.7692	4.9608
C9's	C9's	5.3403	6.1037	6.0706
C10's	C10's	2.7792	3.2726	3.1792
C11's	C11's	17.6256	21.2892	18.0577
C12's	C12's	24.7352	35.3902	33.0056
C13's	C13's	2.7880	4.6334	4.5066
TOTAL		100.0002	100.0000	100.0000

	Totals
SPECIFIC GRAVITY @ 60 DEG. F. (WATER = 1)	0.7397
MOLECULAR WEIGHT	110.9408

Comments:

POUNDS/GALLON (ABSOLUTE DENSITY)	6.1670
CALC. VAPOR PRESSURE @ 14.65 PSIA, 100 Deg. F.	497.4867
CUFT. VAPOR / GALLON @ 14.65 PSIA, 60 Deg. G.	21.2276
BTU / CUFT. DRY GAS @ 14.65 PSIA, 60 Deg. F.	5,727.2361
BTU / GALLON LIQUID	123,928.7686
BTU / POUND	19,959.0516

Comments:

EQT Production
WEU-51

Names	Units	LPT Gas to VRU	PW Tank Flash	Condensate Flash	Combined Flash Vapor
Temperature	°F	110	70*	70	69.847
Pressure	psig	30	0.625*	0.625*	0.625
Mole Fraction Vapor	%	100	100	100	100
Std Vapor Volumetric Flow	MSCFD	57.702	7.9437	3.8246	11.768
Net Ideal Gas Heating Value	Btu/ft^3	1661	1009.9	1948	1314.8
Molecular Weight	lb/lbmol	31.25	19.63	36.947	25.258
Methane(Mole Fraction)	%	42.176	79.216	21.253	60.378
Ethane(Mole Fraction)	%	27.9	12.321	35.071	19.715
Propane(Mole Fraction)	%	16.475	2.8394	25.328	10.148
Isobutane(Mole Fraction)	%	2.7881	0.11583	4.234	1.4542
n-Butane(Mole Fraction)	%	5.3171	0.45214	7.873	2.8639
Isopentane(Mole Fraction)	%	1.4615	0.058537	1.98	0.68299
n-Pentane(Mole Fraction)	%	1.2687	0.049107	1.6559	0.57131
n-Hexane(Mole Fraction)	%	0.57781	0.0080163	0.65423	0.21803
Benzene(Mole Fraction)	%	0.01413	0.012288	0.016279	0.013565
n-Heptane(Mole Fraction)	%	0.51865	0.0053265	0.50989	0.16931
n-Octane(Mole Fraction)	%	0.088717	0.00069345	0.075148	0.024891
n-Nonane(Mole Fraction)	%	0.044842	0.00093006	0.032877	0.011313
n-Decane(Mole Fraction)	%	0.11253	0.0015696	0.071184	0.024194
Toluene(Mole Fraction)	%	0.021046	0.015734	0.021115	0.017483
m-Xylene(Mole Fraction)	%	0.023556	0.014896	0.019729	0.016467
Ethylbenzene(Mole Fraction)	%	1.7941e-005	1.1271e-005	1.5484e-005	1.264e-005

VRU

Q-3

LPT Gas to VRU

Properties	Pipeline	
Std Vapor Volumetric Flow (Total)	10	MMSCFD
Pressure(Total)	425	psig
Temperature(Total)	91	°F

Compressed Gas to Sales

Pipeline

MIX-101

Sales Gas

Properties	Reservoir Gas	
Std Vapor Volumetric Flow (Total)	10*	MMSCFD
Pressure(Total)	700*	psig
Temperature(Total)	75*	°F
Std Liquid Volumetric Flow (Light Liquid)	18.3	bbl/d

Properties	Reservoir Water	
Pressure(Total)	700*	psig
Temperature(Total)	75*	°F
Std Liquid Volumetric Flow (Total)	1821*	bbl/d

Combined Flowstream

1

Preheat

Q-4

Choke

2

Post Heat

Q-12

8

Reservoir Gas

Reservoir Water

Reservoir Oil

MIX-102

Q-13

High Pressure Tower

Separator Oil

Low Pressure Tower

Q-7

Properties	Reservoir Oil	
Pressure(Total)	717*	psig
Temperature(Total)	75*	°F
Std Liquid Volumetric Flow (Total)	198*	bbl/d

GPU PW

LPT Produced Water

MIX-104

Combined PW

Q-1

Water Tanks

PW Tank Flash

Condensate Flash

Oil Tanks

Q-9

LPT Condensate

Tank loss calculations for "LPT Condensate".
Total working and breathing losses from the Vertical Cylinder are 8.559 ton/yr.
Flashing losses are 37.01 ton/yr.
Loading losses are 31.1 ton/yr of loaded liquid.

Tank loss calculations for "Combined PW".
Total working and breathing losses from the Vertical Cylinder are 0.8757 ton/yr.
Flashing losses are 6.553 ton/yr.
Loading losses are 2.346 ton/yr of loaded liquid.
Warning, expansion coefficient is negative. Verify vapor pressure of stored fluid

Properties	Produced Water	
Std Liquid Volumetric Flow (Total)	1818.8	bbl/d
API Gravity(Total)	10.015	

Produced Water

Properties	Sales Oil	
Std Liquid Volumetric Flow (Total)	202	bbl/d
API Gravity(Total)	66.04	

Sales Oil

MIX-100

Combined Flash Vapor

Combustion Air

MIX-105

5

REAC-100

Flare Emissions

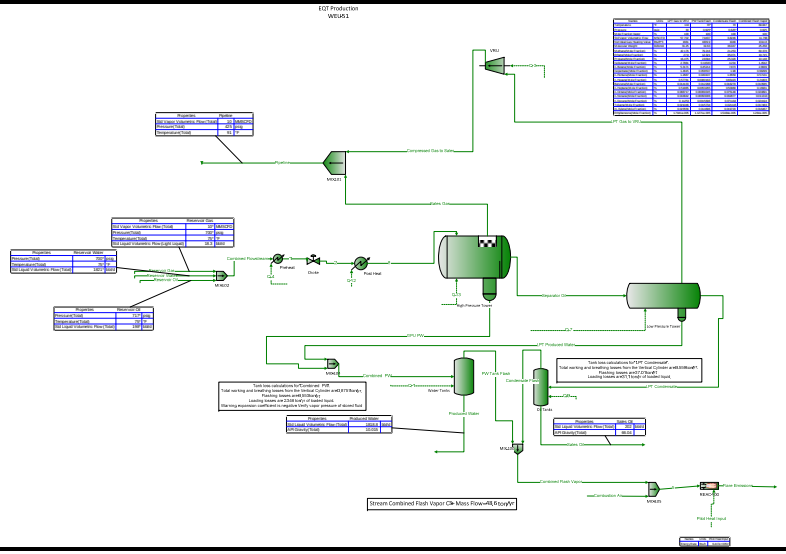
Pilot Heat Input

Names	Units	Pilot Heat Input
Energy Rate	Btu/h	6.447e+005#

Stream Combined Flash Vapor C3+ Mass Flow =48.6 ton/yr

WEU-51
Plant Schematic

Client Name:	EQT	Job: V1.0
Location:	WEU-51	
Flowsheet:	WEU-51	



Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	EQT	Job: V1.0
Location:	WEU-51	
Flowsheet:	WEU-51	

Connections

	Combined PW	Combined Flash Vapor	Pipeline	Produced Water	Reservoir Gas
From Block	MIX-104	MIX-100	MIX-101	Water Tanks	--
To Block	Water Tanks	MIX-105	--	--	MIX-102

Stream Composition

Mole Fraction	Combined PW	Combined Flash Vapor	Pipeline	Produced Water	Reservoir Gas
Nitrogen	1.40942E-06	0.00162582	0.00428882	3.00357E-08	0.00428 *
Methane	0.000489545	0.603779	0.805668	2.07373E-05	0.80616 *
CO2	2.56343E-05	0.0160869	0.00241878	1.22647E-05	0.0024 *
Ethane	7.66977E-05	0.197145	0.133411	3.78133E-06	0.13296 *
Propane	1.77982E-05	0.101482	0.0354992	9.94319E-07	0.03541 *
Isobutane	7.00047E-07	0.014542	0.00419493	1.45525E-08	0.00426 *
n-Butane	2.80997E-06	0.0286387	0.00728514	1.34164E-07	0.00746 *
Isopentane	3.57532E-07	0.00682991	0.00172256	1.11023E-08	0.00191 *
n-Pentane	2.99717E-07	0.00571315	0.00145121	9.09162E-09	0.00164 *
n-Hexane	4.80604E-08	0.00218031	0.000632914	6.17796E-10	0.00055 *
Methylcyclopentane	0	0	0	0	0 *
Benzene	5.58312E-07	0.000135853	1.49769E-05	4.85874E-07	2E-05 *
Cyclohexane	4.15075E-08	0.000169923	3.79294E-05	6.61013E-09	9E-05 *
n-Heptane	3.20008E-08	0.00169307	0.000590057	4.77343E-10	0.00079 *
n-Octane	4.14375E-09	0.000248907	0.000104721	3.97199E-11	0.00011 *
n-Nonane	5.67679E-09	0.000113126	5.50701E-05	1.72557E-10	0.0003 *
n-Decane	9.50818E-09	0.000241939	0.000148397	2.1869E-10	0.00013 *
n-Undecane	0	0	0	0	0 *
Dodecane	0	0	0	0	0 *
Water	0.999383	0.0167928	0.00177424	0.99996	0 *
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	4.42957E-08	0.00183225	0.000509868	6.19345E-10	0.00091 *
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	1.30343E-09	0.000409333	0.000142719	2.08277E-12	0.00052 *
Decane, 2-Methyl-	0	0	0	0	0 *
Toluene	6.23899E-07	0.000174828	2.28968E-05	5.31094E-07	5E-05 *
m-Xylene	5.93598E-07	0.000164669	2.65796E-05	5.05736E-07	5E-05 *
Ethylbenzene	4.26364E-10	1.264E-07	2.02051E-08	3.59873E-10	0 *

Mass Flow	Combined PW lb/h	Combined Flash Vapor lb/h	Pipeline lb/h	Produced Water lb/h	Reservoir Gas lb/h
Nitrogen	0.058187	0.0588499	132.122	0.00123927	131.645 *
Methane	11.574	12.5158	14213.5	0.489988	14200 *
CO2	1.6626	0.914804	117.062	0.794998	115.972 *
Ethane	3.39877	7.65975	4411.47	0.167466	4389.7 *
Propane	1.15662	5.78218	1721.42	0.0645779	1714.42 *
Isobutane	0.0599638	1.09213	268.127	0.00124579	271.861 *
n-Butane	0.240693	2.15082	465.643	0.0114853	476.075 *
Isopentane	0.0380158	0.636726	136.671	0.00117979	151.306 *
n-Pentane	0.0318684	0.532614	115.142	0.000966124	129.917 *
n-Hexane	0.00610366	0.242778	59.9793	7.84135E-05	52.0404 *
Methylcyclopentane	0	0	0	0	0 *
Benzene	0.0642709	0.0137118	1.28651	0.0558989	1.71531 *
Cyclohexane	0.00514813	0.0184784	3.51037	0.000819362	8.31649 *

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	EQT	Job: V1.0
Location:	WEU-51	
Flowsheet:	WEU-51	

Mass Flow	Combined PW lb/h	Combined Flash Vapor lb/h	Pipeline lb/h	Produced Water lb/h	Reservoir Gas lb/h
n-Heptane	0.0047256	0.219209	65.0194	7.04481E-05	86.9156 *
n-Octane	0.00069757	0.0367384	13.1547	6.6826E-06	13.7963 *
n-Nonane	0.00107299	0.0187476	7.76718	3.25964E-05	42.2465 *
n-Decane	0.00199373	0.0444799	23.2191	4.5829E-05	20.3089 *
n-Undecane	0	0	0	0	0 *
Dodecane	0	0	0	0	0 *
Water	26533.4	0.390907	35.1501	26533	0 *
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	0.00562555	0.204022	48.3185	7.86101E-05	86.1032 *
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	0.000219423	0.0604171	17.9279	3.50412E-07	65.2188 *
Decane, 2-Methyl-	0	0	0	0	0 *
Toluene	0.0847179	0.0208143	2.32	0.0720733	5.05831 *
m-Xylene	0.0928739	0.0225893	3.10316	0.0790803	5.82836 *
Ethylbenzene	6.67086E-05	1.73395E-05	0.00235893	5.62722E-05	0 *

Volumetric Flow	Combined PW gpm	Combined Flash Vapor ft^3/h	Pipeline ft^3/h	Produced Water gpm	Reservoir Gas ft^3/h
Nitrogen	0.000158063	0.780906	65.7134	3.30988E-06	40.7439
Methane	0.057415	289.019	11422	0.00239476	6614.47
CO2	0.0026359	7.67855	31.9507	0.00124354	16.9697
Ethane	0.011495	93.7284	1595.15	0.000559801	755.475
Propane	0.00334205	47.9795	362.518	0.000184702	131.791
Isobutane	0.000158329	6.8453	37.59	3.25831E-06	10.005
n-Butane	0.000627414	13.4614	61.0975	2.96625E-05	12.636
Isopentane	9.22173E-05	3.19564	12.0282	2.83687E-06	0.388671
n-Pentane	7.7448E-05	2.67072	9.77569	2.32761E-06	-0.0727567
n-Hexane	1.40937E-05	1.01315	3.17102	1.79563E-07	-0.855979
Methylcyclopentane	0	0	0	0	0
Benzene	0.000120754	0.0633994	0.0902238	0.000104248	-0.0138208
Cyclohexane	1.04799E-05	0.0791352	0.206146	1.65536E-06	-0.10248
n-Heptane	1.05541E-05	0.782341	1.9178	1.56076E-07	-1.93395
n-Octane	1.50857E-06	0.114382	0.183353	1.43385E-08	-0.207445
n-Nonane	2.26528E-06	0.0516561	-0.000755592	6.82852E-08	-0.129596
n-Decane	4.14215E-06	0.109844	-0.23429	9.44852E-08	0.140401
n-Undecane	0	0	0	0	0
Dodecane	0	0	0	0	0
Water	53.2775	8.02314	24.0192	53.1184	0
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	1.30095E-05	0.852474	2.75874	1.80271E-07	-1.13602
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	4.69727E-07	0.189042	0.46565	7.44125E-10	-1.2577
Decane, 2-Methyl-	0	0	0	0	0
Toluene	0.000157525	0.0810966	0.0973468	0.000133056	-0.0813615
m-Xylene	0.000171271	0.0759564	0.0719631	0.000144809	-0.0555046

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	EQT	Job: V1.0
Location:	WEU-51	
Flowsheet:	WEU-51	

Volumetric Flow	Combined PW gpm	Combined Flash Vapor ft^3/h	Pipeline ft^3/h	Produced Water gpm	Reservoir Gas ft^3/h
Ethylbenzene	1.22362E-07	5.83519E-05	5.91442E-05	1.02496E-07	0

Stream Properties

Property	Units	Combined PW	Combined Flash Vapor	Pipeline	Produced Water	Reservoir Gas
Temperature	°F	90	69.8467	90.7813	70	75 *
Pressure	psig	425	0.625	425	0.625	700 *
Mole Fraction Vapor		0	1	0.999986	0	0.99782
Mole Fraction Light Liquid		1	0	1.43982E-05	1	0.00218033
Mole Fraction Heavy Liquid		0	0	0	0	0
Molecular Weight	lb/lbmol	18.0167	25.2578	19.8799	18.0158	20.008
Mass Density	lb/ft^3	62.0453	0.0684498	1.60389	62.2746	2.89944
Mass Flow	lb/h	26551.9	32.6365	21861.9	26534.8	21968.4
Vapor Volumetric Flow	ft^3/h	427.944	476.795	13630.6	426.093	7576.77
Liquid Volumetric Flow	gpm	53.354	59.4446	1699.39	53.1233	944.636
Std Liquid Volumetric Flow	sgpm	53.1491	0.169951	131.04	53.0484	131.273
Specific Gravity		0.994809	0.872084		0.998486	
API Gravity		10.0613			10.0152	
Net Ideal Gas Heating Value	Btu/ft^3	0.632058	1314.82	1088.45	0.0343659	1096.63
Net Liquid Heating Value	Btu/lb	-1045.74	19650	20723.4	-1058.97	20746.3
Std Vapor Volumetric Flow	MMSCFD	13.4222	0.0117683	10.0156	13.4143	10 *

Remarks

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	EQT	Job: V1.0
Location:	WEU-51	
Flowsheet:	WEU-51	

Connections

	Reservoir Oil	Sales Oil			
From Block	--	Oil Tanks			
To Block	MIX-102	--			

Stream Composition

Mole Fraction	Reservoir Oil		Sales Oil			
Nitrogen	0.00101	*	2.55595E-07			
Methane	0.0881128	*	0.00114463			
CO2	0.00338499	*	3.88682E-05			
Ethane	0.0628689	*	0.0117448			
Propane	0.0465299	*	0.0330944			
Isobutane	0.011065	*	0.0142775			
n-Butane	0.0281909	*	0.0378577			
Isopentane	0.014691	*	0.0264221			
n-Pentane	0.017585	*	0.0296822			
n-Hexane	0.0433679	*	0.0407141			
Methylcyclopentane	0	*	0			
Benzene	0.000760998	*	0.00106425			
Cyclohexane	0	*	0.00317623			
n-Heptane	0.0846138	*	0.101861			
n-Octane	0.0470869	*	0.0502577			
n-Nonane	0.0534029	*	0.0716679			
n-Decane	0.479279	*	0.507384			
n-Undecane	0	*	0			
Dodecane	0	*	0			
Water	0	*	3.58646E-05			
Triethylene Glycol	0	*	0			
Oxygen	0	*	0			
Argon	0	*	0			
Carbon Monoxide	0	*	0			
Cyclopentane	0	*	0			
Isohexane	0	*	0.0243527			
3-Methylpentane	0	*	0			
Neohexane	0	*	0			
2,3-Dimethylbutane	0	*	0			
Methylcyclohexane	0	*	0			
Isooctane	0	*	0.0230895			
Decane, 2-Methyl-	0	*	0			
Toluene	0.00281099	*	0.00458596			
m-Xylene	0.015227	*	0.0175367			
Ethylbenzene	1.2E-05	*	1.14532E-05			

Mass Flow	Reservoir Oil lb/h		Sales Oil lb/h			
Nitrogen	0.537599	*	0.000128218			
Methane	26.8585	*	0.328828			
CO2	2.83059	*	0.0306318			
Ethane	35.9193	*	6.32407			
Propane	38.9852	*	26.1326			
Isobutane	12.2198	*	14.8602			
n-Butane	31.1332	*	39.4029			
Isopentane	20.1397	*	34.1373			
n-Pentane	24.107	*	38.3493			
n-Hexane	71.0107	*	62.829			
Methylcyclopentane	0	*	0			
Benzene	1.12947	*	1.48865			
Cyclohexane	0	*	4.78683			
n-Heptane	161.098	*	182.775			
n-Octane	102.199	*	102.804			
n-Nonane	130.14	*	164.601			

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	EQT	Job: V1.0
Location:	WEU-51	
Flowsheet:	WEU-51	

Mass Flow	Reservoir Oil lb/h	Sales Oil lb/h			
n-Decane	1295.72 *	1292.76			
n-Undecane	0 *	0			
Dodecane	0 *	0			
Water	0 *	0.0115702			
Triethylene Glycol	0 *	0			
Oxygen	0 *	0			
Argon	0 *	0			
Carbon Monoxide	0 *	0			
Cyclopentane	0 *	0			
Isohexane	0 *	37.5805			
3-Methylpentane	0 *	0			
Neohexane	0 *	0			
2,3-Dimethylbutane	0 *	0			
Methylcyclohexane	0 *	0			
Isooctane	0 *	47.2305			
Decane, 2-Methyl-	0 *	0			
Toluene	4.92122 *	7.56665			
m-Xylene	30.7162 *	33.3397			
Ethylbenzene	0.0242066 *	0.0217741			

Volumetric Flow	Reservoir Oil gpm	Sales Oil gpm			
Nitrogen	0.00172674	3.76508E-07			
Methane	0.156212	0.0017828			
CO2	0.00350555	3.12303E-05			
Ethane	0.146267	0.0247128			
Propane	0.142193	0.0933408			
Isobutane	0.0421929	0.050876			
n-Butane	0.104404	0.130871			
Isopentane	0.0639734	0.10822			
n-Pentane	0.076007	0.120537			
n-Hexane	0.213638	0.189256			
Methylcyclopentane	0	0			
Benzene	0.00251306	0.00329175			
Cyclohexane	0	0.0122394			
n-Heptane	0.4698	0.535328			
n-Octane	0.288356	0.291894			
n-Nonane	0.357956	0.45628			
n-Decane	3.5043	3.52821			
n-Undecane	0	0			
Dodecane	0	0			
Water	0	-2.11456E-05			
Triethylene Glycol	0	0			
Oxygen	0	0			
Argon	0	0			
Carbon Monoxide	0	0			
Cyclopentane	0	0			
Isohexane	0	0.114489			
3-Methylpentane	0	0			
Neohexane	0	0			
2,3-Dimethylbutane	0	0			
Methylcyclohexane	0	0			
Isooctane	0	0.136375			
Decane, 2-Methyl-	0	0			
Toluene	0.0111216	0.017104			
m-Xylene	0.0697663	0.075994			
Ethylbenzene	5.48807E-05	4.95989E-05			

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	EQT	Job: V1.0
Location:	WEU-51	
Flowsheet:	WEU-51	

Stream Properties

Property	Units	Reservoir Oil	Sales Oil			
Temperature	°F	75 *	70 *			
Pressure	psig	717 *	0.625			
Mole Fraction Vapor		0	0			
Mole Fraction Light Liquid		1	1			
Mole Fraction Heavy Liquid		0	0			
Molecular Weight	lb/lbmol	104.716	117.123			
Mass Density	lb/ft^3	43.8743	44.389			
Mass Flow	lb/h	1989.69	2097.36			
Vapor Volumetric Flow	ft^3/h	45.3497	47.2496			
Liquid Volumetric Flow	gpm	5.65398	5.89086			
Std Liquid Volumetric Flow	sgpm	5.775 *	5.90314			
Specific Gravity		0.703464	0.711716			
API Gravity		67.603	66.0417			
Net Ideal Gas Heating Value	Btu/ft^3	5305.71	5928.91			
Net Liquid Heating Value	Btu/lb	19071.8	19052.4			
Std Vapor Volumetric Flow	MMSCFD	0.173052	0.163094			

Remarks

Energy Stream Report

Client Name:	EQT	Job: V1.0
Location:	WEU-51	
Flowsheet:	WEU-51	

Energy Streams

Energy Stream	Energy Rate	Power	From Block	To Block
Pilot Heat Input	644716 * Btu/h	253.383 * hp	--	REAC-100

Remarks

20160120_EQT_WEU 51.pmx
Project Warnings Report

Client Name:	EQT	Job: V1.0
Location:	WEU-51	

ProMax:ProMax!Project!Flowsheets!WEU-51!Blocks!VRU
Warning: The change in entropy is negative.

User Value Sets Report

Client Name:	EQT	Job: V1.0
Location:	WEU-51	

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	0.875	psig	Upper Bound	psig
Lower Bound		psig	* Enforce Bounds	False

User Value [BreatherVacP]

* Parameter	-0.0375	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	209.439	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 Sets Report

Client Name:	EQT	Job: V1.0
Location:	WEU-51	

User Value [MaxLiqSurfaceT]

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

User Value [TotalLosses]

* Parameter	8.55939	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [WorkingLosses]

* Parameter	2.0015	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [StandingLosses]

* Parameter	0.138353	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	31.0992	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	37.0102	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [GasMoleWeight]

* Parameter	0.0517727	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 Sets Report

Client Name:	EQT	Job: V1.0
Location:	WEU-51	

User Value [ShellDiam]

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

User Value [BreatherVP]

* Parameter	0.875	psig	Upper Bound	psig
Lower Bound		psig	* Enforce Bounds	False

User Value [BreatherVacP]

* Parameter	-0.0375	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	1829.28	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	0.875669	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [WorkingLosses]

* Parameter	0.218917	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 Sets Report

Client Name:	EQT	Job: V1.0
Location:	WEU-51	

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	2.34643	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	6.55342	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [GasMoleWeight]

* Parameter	0.044865	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}

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

Project File : \\tsclient\Z\Client\EQT Corporation\West Virginia\WV Wells\153901.0056 WV Wells 2015\WEU 51\02 Draft\20160202_EQT_WEU-51_G70-B Application\Att S Emission Calcs\01 E&P TANK\20160202_EQT_WEU-51_G70_Sand Separator Tank.ept
Flowsheet Selection : Oil Tank with Separator
Calculation Method : RVP Distillation
Control Efficiency : 100.0%
Known Separator Stream : Low Pressure Oil
Entering Air Composition : No

Filed Name : WEU-51 Wellpad
Well Name : Sand Separator Tank
Date : 2016.02.02

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

Separator Pressure : 717.00[psig]
Separator Temperature : 60.00[F]
Ambient Pressure : 14.70[psia]
Ambient Temperature : 70.00[F]
C10+ SG : 0.7397
C10+ MW : 110.94

-- Low Pressure Oil

No.	Component	mol %
1	H2S	0.0000
2	O2	0.0000
3	CO2	0.3385
4	N2	0.1010
5	C1	8.8113
6	C2	6.2869
7	C3	4.6530
8	i-C4	1.1065
9	n-C4	2.8191
10	i-C5	1.4691
11	n-C5	1.7585
12	C6	0.0000
13	C7	8.4614
14	C8	4.7087
15	C9	5.3403
16	C10+	47.9280
17	Benzene	0.0761
18	Toluene	0.2811
19	E-Benzene	0.0012
20	Xylenes	1.5227
21	n-C6	4.3368
22	224Trimethylp	0.0000

-- Sales Oil

20160202_EQT_WEU-51_G70_Sand Separator Tank

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]
Total HAPs	0.010	0.002

Page 1 E&P TANK

Total HC	0.353	0.081
VOCs, C2+	0.272	0.062
VOCs, C3+	0.174	0.040

Uncontrolled Recovery Info.

Vapor	24.2600 x1E-3	[MSCFD]
HC Vapor	23.7500 x1E-3	[MSCFD]
GOR	242.60	[SCF/bbl]

-- Emission Composition

No	Component	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]
1	H2S	0.000	0.000
2	O2	0.000	0.000
3	CO2	0.008	0.002
4	N2	0.002	0.000
5	C1	0.081	0.018
6	C2	0.098	0.022
7	C3	0.080	0.018
8	i-C4	0.016	0.004
9	n-C4	0.032	0.007
10	i-C5	0.010	0.002
11	n-C5	0.009	0.002
12	C6	0.000	0.000
13	C7	0.005	0.001
14	C8	0.001	0.000
15	C9	0.000	0.000
16	C10+	0.015	0.003
17	Benzene	0.000	0.000
18	Toluene	0.000	0.000
19	E-Benzene	0.000	0.000
20	Xylenes	0.000	0.000
21	n-C6	0.006	0.001
22	224Trimethylp	0.000	0.000
	Total	0.363	0.083

-- Stream Data

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

20160202_EQT_WEU-51_G70_Sand Separator Tank

			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	0.3385	0.0284	0.0235	1.5791	1.5983	1.5793
4	N2	28.01	0.1010	0.0007	0.0001	0.5022	0.0958	0.4983
5	C1	16.04	8.8113	0.2302	0.1334	43.1390	27.3055	42.9870
6	C2	30.07	6.2869	0.9267	0.8337	27.7297	31.2479	27.7634
7	C3	44.10	4.6530	1.9359	1.8803	15.5225	20.7868	15.5730
8	i-C4	58.12	1.1065	0.7946	0.7870	2.3542	3.4469	2.3647
9	n-C4	58.12	2.8191	2.3481	2.3348	4.7031	7.1354	4.7265
10	i-C5	72.15	1.4691	1.5560	1.5556	1.1215	1.8325	1.1284
11	n-C5	72.15	1.7585	1.9470	1.9483	1.0045	1.6971	1.0112
12	C6	86.16	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
13	C7	100.20	8.4614	10.4592	10.4895	0.4693	0.9484	0.4739
14	C8	114.23	4.7087	5.8663	5.8843	0.0777	0.1722	0.0786
15	C9	128.28	5.3403	6.6681	6.6889	0.0286	0.0692	0.0290
16	C10+	110.94	47.9280	59.6185	59.7995	1.1608	2.5013	1.1736
17	Benzene	78.11	0.0761	0.0930	0.0932	0.0087	0.0165	0.0088
18	Toluene	92.13	0.2811	0.3493	0.3503	0.0084	0.0178	0.0085
19	E-Benzene	106.17	0.0012	0.0015	0.0015	0.0000	0.0000	0.0000
20	Xylenes	106.17	1.5227	1.9003	1.9062	0.0122	0.0283	0.0123
21	n-C6	86.18	4.3368	5.2762	5.2898	0.5786	1.0999	0.5836
22	224Trimethylp	114.24	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	MW		88.54	102.94	102.94	30.96	37.33	31.02
	Stream Mole Ratio		1.0000	0.8000	0.7975	0.2000	0.0019	0.2019
	Heating Value	[BTU/SCF]				1761.99	2106.88	1765.30
	Gas Gravity	[Gas/Air]				1.07	1.29	1.07
	Bubble Pt. @ 100F	[psia]	372.77	22.14	18.12			
	RVP @ 100F	[psia]	91.25	11.49	10.52			

	Spec. Gravity @ 100F		0.694	0.722	0.722			

ATTACHMENT T

Emission Summary Sheet

ATTACHMENT T – FACILITY-WIDE CONTROLLED EMISSIONS SUMMARY SHEET

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

Emission Point ID# (Emission Source ID)	NO_x		CO		VOC		SO_2		PM_{10}		$PM_{2.5}$		GHG (CO_2e)	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
C017 (S008-S016, C017)	**1.15**	**5.03**	**0.96**	**4.22**	**1.02**	**0.77**	**0.01**	**0.03**	**0.09**	**0.38**	**0.09**	**0.38**	**1,374.2**	**6,019.1**
C018 (S008-S016, C018)	**1.15**	**5.03**	**0.96**	**4.22**	**1.02**	**0.77**	**0.01**	**0.03**	**0.09**	**0.38**	**0.09**	**0.38**	**1,374.2**	**6,019.1**
E001 (S001)	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	180.18	789.20
E002 (S002)	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	180.18	789.20
E003 (S003)	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	180.18	789.20
E004 (S004)	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	180.18	789.20
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	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	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	180.18	789.20
E016 (S016)	---	---	---	---	38.59	10.03	---	---	---	---	---	---	---	---
E019 (S019)	1.2E-03	5.4E-03	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	1.52	6.64
E020 (S020)	1.2E-03	5.4E-03	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	1.52	6.64
E021 (S021)	0.11	0.48	0.09	0.40	0.01	0.03	6.6E-04	2.9E-03	0.01	0.04	0.01	0.04	135.14	591.90
E022 (S022)	---	---	---	---	0.04	0.17	---	---	---	---	---	---	0.45	2.03
E023 (S023)	0.24	1.06	0.49	2.12	0.19	0.81	4.5E-04	2.0E-03	0.01	0.07	0.01	0.07	90.18	394.99
Fugitives	---	---	---	---	---	20.38	---	---	---	---	---	---	---	677.56
Haul Roads	---	---	---	---	---	---	---	---	---	1.45	---	0.15	---	---
Facility Total	3.68	16.11	3.37	14.76	40.92	33.20	0.02	0.09	0.28	2.66	0.28	1.35	4,238.54	19,242.41
Facility Total (excl. fugitives)	3.68	16.11	3.37	14.76	2.33	2.79	0.02	0.09	0.28	1.21	0.28	1.21	4,238.54	18,564.85

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 T – 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
C017 (S008-S016, C017)	---	---	9.0E-04	8.1E-04	7.1E-04	9.7E-04	5.2E-07	7.5E-07	6.5E-04	9.7E-04	0.02	0.01	0.03	0.02
C018 (S008-S016, C018)	---	---	9.0E-04	8.1E-04	7.1E-04	9.7E-04	5.2E-07	7.5E-07	6.5E-04	9.7E-04	0.02	0.01	0.03	0.02
E001 (S001)	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
E002 (S002)	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
E003 (S003)	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
E004 (S004)	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
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
E016 (S016)	---	---	0.03	0.01	0.02	0.01	1.6E-05	4.1E-06	0.02	0.01	0.75	0.19	0.99	0.26
E019 (S019)	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
E020 (S020)	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
E021 (S021)	8.2E-05	3.6E-04	2.3E-06	1.0E-05	3.7E-06	1.6E-05	---	---	---	---	2.0E-03	0.01	2.1E-03	0.01
E022 (S022)	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.0E-03	<0.01	2.0E-03	0.01
E023 (S023)	0.02	0.07	1.2E-03	0.01	4.3E-04	1.9E-03	1.9E-05	8.4E-05	1.5E-04	6.6E-04	---	---	0.02	0.11
Fugitives	---	---	---	0.01	---	0.03	---	<0.01	---	0.03	---	0.30	---	0.84
Haul Roads	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Facility Total	0.02	0.07	0.04	0.03	0.02	0.04	3.6E-05	8.9E-05	0.02	0.04	0.81	0.62	1.10	1.36
Facility Total (excl. fugitives)	0.02	0.07	3.0E-03	0.01	1.9E-03	4.0E-03	2.0E-05	8.5E-05	1.5E-03	2.6E-03	0.06	0.12	0.10	0.26

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

Class I Legal Advertisement

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-B General Permit Registration for modification to an existing natural gas production facility WEU-51 located on Maxwell Ridge Road, near West Union, in Doddridge County, West Virginia. The latitude and longitude coordinates are: 39.25592° N and -80.76326° W.

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

Pollutant	Emissions in tpy (tons per year)
NOx	16.11
CO	14.76
VOC	2.79
SO_2	0.09
PM	1.21
Total HAPs	1.36
Carbon Dioxide Equivalents (CO_2e)	18,564.85

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
Kenneth Kirk, Executive Vice President
625 Liberty Ave Suite 1700
Pittsburgh, PA 15222

ATTACHMENT V

General Permit Registration Application Fee