



625 Liberty Ave, Suite 1700
Pittsburgh PA 15222
www.eqt.com

TEL: (412) 395-3699

FAX: (412) 395-2156

Alex Bosiljevac
Environmental Coordinator

August 24, 2015

CERTIFIED MAIL # 7015 0640 0000 9694 4403

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

**RE: G70A Permit Modification
EQT Production Company
WEU-51 Natural Gas Production Site**

Dear Mr. Durham,

Enclosed are two electronic and one original hard copy of a proposed modification to the G70-A General Air Permit for the WEU-51 Natural Gas Production Well Site. 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.

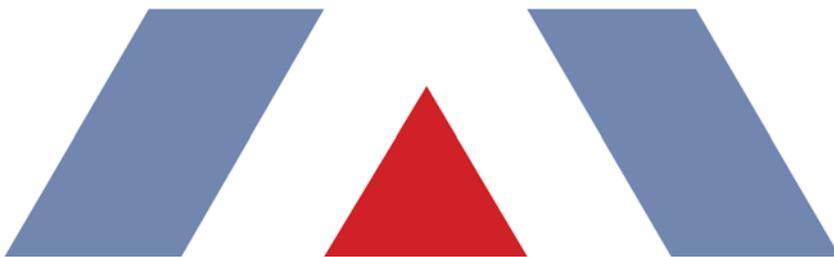
If you have any questions concerning this permit application, please contact me at (412) 395-3699 or by email at abosiljevac@eqt.com.

Sincerely,

A handwritten signature in blue ink that reads 'RAB' followed by a large, stylized flourish.

Alex Bosiljevac
EQT Corporation

Enclosures



PROJECT REPORT

**EQT Production
WEU-51 Pad**

G70-A Permit Application



Where energy meets innovation.

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

August 2015

Trinity 
Consultants

Environmental solutions delivered uncommonly well

TABLE OF CONTENTS

1. INTRODUCTION	4
1.1. FACILITY AND PROJECT DESCRIPTION	4
1.2. SOURCE STATUS	4
1.3. G70-A APPLICATION ORGANIZATION	4
2. SAMPLE EMISSION SOURCE CALCULATIONS	6
3. REGULATORY DISCUSSION	7
3.1. Prevention of Significant Deterioration (PSD) Source Classification	7
3.2. Title V Operating Permit Program	7
3.3. New Source Performance Standards	7
3.3.1. NSPS Subparts D, Da, Db, and Dc	8
3.3.2. NSPS Subparts K, Ka, and Kb	8
3.3.3. NSPS Subpart OOOO—Crude Oil and Natural Gas Production, Transmission, and Distribution	8
3.3.4. Non-Applicability of All Other NSPS	9
3.4. National Emission Standards for Hazardous Air Pollutants (NESHAP)	9
3.4.1. 40 CFR 63 Subpart HH – Oil and Natural Gas Production Facilities	9
3.4.2. 40 CFR 63 Subpart JJJJJ – Industrial, Commercial, and Institutional Boilers	9
3.5. West Virginia SIP Regulations	9
3.5.1. 45 CSR 2: To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers	9
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	10
3.5.3. 45 CSR 6: Control of Air Pollution from the Combustion of Refuse	10
3.5.4. 45 CSR 16: Standards of Performance for New Stationary Sources	10
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	10
3.5.6. 45 CSR 21-28: Petroleum Liquid Storage in Fixed Roof Tanks	10
3.5.7. 45 CSR 34: Emissions Standards for Hazardous Air Pollutants	10
3.5.8. Non-Applicability of Other SIP Rules	11
4. G70-A APPLICATION FORMS	12
ATTACHMENT A: CURRENT BUSINESS CERTIFICATE	
ATTACHMENT B: PROCESS DESCRIPTION	
ATTACHMENT C: DESCRIPTION OF FUGITIVE EMISSIONS	
ATTACHMENT D: PROCESS FLOW DIAGRAM	
ATTACHMENT E: PLOT PLAN	
ATTACHMENT F: AREA MAP	
ATTACHMENT G: EMISSION UNIT DATA SHEETS AND G70-A SECTION APPLICABILITY FORM	
ATTACHMENT H: AIR POLLUTION CONTROL DEVICE DATA SHEET	

ATTACHMENT I: EMISSION CALCULATIONS

ATTACHMENT J: CLASS I LEGAL ADVERTISEMENT

ATTACHMENT K: ELECTRONIC SUBMITTAL

ATTACHMENT L: GENERAL PERMIT REGISTRATION APPLICATION FEE

ATTACHMENT M: SITING CRITERIA WAIVER (*NOT APPLICABLE*)

ATTACHMENT N: MATERIAL SAFETY DATA SHEET (*NOT APPLICABLE*)

ATTACHMENT O: EMISSION SUMMARY SHEET

1. INTRODUCTION

EQT Production Company (EQT) is submitting this modification application to the West Virginia Department of Environmental Protection (WVDEP) for the existing natural gas production well pad, WEU-51 located in Doddridge County, West Virginia. The facility is currently permitted under General Permit G70-A099.

1.1. FACILITY AND PROJECT DESCRIPTION

The WEU-51 pad is a natural gas production facility that consist of seven (7) natural gas wells. Natural gas and produced water 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 wellpad consists of the following equipment:

- > Eight (8) 400 barrel (bbl) storage tanks for condensate/water (produced fluids) controlled by one of two enclosed combustors, each rated at 11.66 MMBtu/hr;
- > Condensate and Produced Water Tank truck loading, controlled by the aforementioned combustors;
- > Seven (7) line heaters, each rated at 1.54 MMBtu/hr (heat input);
- > Two (2) thermoelectric generators (TEGs), each rated at 0.013 MMBtu/hr (heat input); and
- > Associated piping and components.

As part of this application, EQT seeks to increase the current liquid throughput at the facility from 4,997,580 gal/yr to 30,000,000 gal/yr.

A process flow diagram is included as Attachment D.

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

As noted in the engineering evaluation prepared for the current G-70A permit issued in 2014, there are no EQT facilities continuous or adjacent to the WEU-51 Pad and that information has not changed. The nearest wellpad OXF-157, is located approximately 0.9 miles from 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-A APPLICATION ORGANIZATION

This West Virginia Code of State Regulations, Title 45 (CSR) Series 13 (45 CSR 13) G70-A permit application is

organized as follows:

- > Section 2: Sample Emission Source Calculations;
- > Section 3: Regulatory Discussion;
- > Section 4: G70-A Application Forms;
- > Attachment A: Current Business Certificate;
- > Attachment B: Process Description;
- > Attachment C: Description of Fugitive Emissions;
- > Attachment D: Process Flow Diagram;
- > Attachment E: Plot Plan;
- > Attachment F: Area Map;
- > Attachment G: Emission Unit Data Sheets and G70-A Section Applicability Form;
- > Attachment H: Air Pollution Control Device Sheets;
- > Attachment I: Emission Calculations;
- > Attachment J: Class I Legal Advertisement;
- > Attachment K: Electronic Submittal;
- > Attachment L: General Permit Registration Application Fee;
- > Attachment M: Siting Criteria Waiver (*not applicable*);
- > Attachment N: Material Safety Data Sheet (*not applicable*); and
- > Attachment O: Emissions Summary Sheet.

2. SAMPLE EMISSION SOURCE CALCULATIONS

The characteristics of air emissions from the existing 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 I of this application.

Emissions from this project will result from the storage of organic liquids in storage tanks and loading of organic liquids into tank trucks and fugitive emissions from component leaks from the operation of the station. The project will not result in any emissions increase from the existing units (i.e. line heaters, TEGs). The methods by which emissions from each of these source types, as well as the existing source types, are calculated are summarized below.

- > **Line Heaters and 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 Please note that potential emissions of NO_x, CO, PM, SO₂ and GHGs from the combustor are also calculated according to the aforementioned methodologies.
- > **Fugitive Equipment Leaks:** Emissions of VOC and HAPs from leaking equipment components have been estimated using facility estimated component counts and types along with *Table 2-4: Oil & Gas Production Operations Average Emission Factors, 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 in gas service at O&G Production Operations. Greenhouse gas emissions from component leaks are calculated according to the procedures in 40 CFR 98 Subpart W.³
- > **Storage Tanks:** Working, breathing and flashing emissions of VOC and HAPs from the produced fluid stored in the tanks at the facility are calculated using API E&P TANK v2.0.
- > **Tank Truck Loading:** Emissions of VOC and HAPs from the loading of organic liquids from storage tanks to tank truck are calculated using U.S. EPA's AP-42 Chapter 5 Section 2 factors.⁴
- > **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.⁵

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 40 CFR 98 Subpart W, *Petroleum and Natural Gas Systems*, Section 98.233(r), *Population Count and Emission Factors*.

⁴ U.S. EPA, AP 42, Fifth Edition, Volume I, Chapter 5.2, Transportation And Marketing Of Petroleum Liquids, June 2008.

⁵ U.S. EPA, AP 42, Fifth Edition, Volume I, Section 13.2.2, Unpaved Roads, November 2006.

3. REGULATORY DISCUSSION

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 (PSD) 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-A 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 (PSD) SOURCE CLASSIFICATION

Federal construction permitting programs regulate new and modified sources of attainment pollutants under Prevention of Significant Deterioration (PSD). 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 Code of State Regulations (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.⁶ 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 (NSPS), 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

⁶ 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.

provisions. Moreover, any source subject to an NSPS is also subject to the general provisions of NSPS Subpart A, except where expressly noted. The following is a summary of applicability and non-applicability determinations for NSPS regulations of relevance to the wellpad.

3.3.1. NSPS Subparts D, Da, Db, and Dc

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, therefore the requirements of these subparts do not apply.

3.3.2. NSPS Subparts K, Ka, and Kb

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 m³ (~19,813 gallons). All of the tanks at the wellpad will 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 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. This NSPS was published in the Federal Register on August 16, 2012, and has been subsequently amended. The list of potentially affected facilities includes:

- > Gas wellheads
- > Centrifugal compressors located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment
- > Reciprocating compressors located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment
- > Continuous bleed natural gas-driven pneumatic controllers with a bleed rate of > 6 scfh located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment (excluding natural gas processing plants)
- > Continuous bleed natural gas-driven pneumatic controllers located at natural gas processing plants
- > Storage vessels in the production, processing, or transmission and storage segments
- > Sweetening units located onshore that process natural gas produced from either onshore or offshore wells

There are eight (8) produced fluid storage vessels at the wellpad. The storage vessels at the facility will each have potential VOC emissions less than 6 tpy based on the permit application materials and enforceable limits to be included in the G70-A permit. As such, per 60.5365(e), the tanks are not storage vessel affected facilities under the rule.

The pneumatic controllers were ordered and installed after August 23, 2011 and are therefore potentially subject to NSPS OOOO. Per 60.5365(d)(2), 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 OOOO.

3.3.4. Non-Applicability of All Other NSPS

NSPS are developed for particular industrial source categories. Other than NSPS developed for natural gas processing plants (Subparts 0000) 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 (NESHAP)

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 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

Glycol dehydration units are potentially subject to Subpart HH, NESHAP from Natural Gas Production Facilities. This standard applies to such units at natural gas production facilities that are major or area sources of HAP emissions. 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 JJJJJJ - Industrial, Commercial, and Institutional Boilers

This MACT standard applies to industrial, commercial, and institutional boilers of various sizes and fuel types at area sources. The line heaters and TEGs are natural gas fired; therefore the requirements of this subpart do not apply.

3.5. WEST VIRGINIA SIP REGULATIONS

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

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

45 CSR 2 applies to fuel burning units, defined as equipment burning fuel “for the primary purpose of producing heat or power by indirect heat transfer”. The line heaters and TEGs 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. Per 45 CSR 2-4, PM emissions from the units will not exceed a level of 0.09 multiplied by the heat design input in MMBtu/hr of the unit.

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 CFR 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 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 CFR 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-A APPLICATION FORMS

The WVDEP permit application forms contained in this application include all applicable G70-A 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 • www.dep.wv.gov/daq

APPLICATION FOR GENERAL PERMIT REGISTRATION
 CONSTRUCT, MODIFY, RELOCATE OR ADMINISTRATIVELY UPDATE
 A STATIONARY SOURCE OF AIR POLLUTANTS

- CONSTRUCTION MODIFICATION RELOCATION CLASS I ADMINISTRATIVE UPDATE
 CLASS II ADMINISTRATIVE UPDATE

CHECK WHICH TYPE OF GENERAL PERMIT REGISTRATION YOU ARE APPLYING FOR:

- | | |
|---|---|
| <input type="checkbox"/> G10-D – Coal Preparation and Handling | <input type="checkbox"/> G40-C – Nonmetallic Minerals Processing |
| <input type="checkbox"/> G20-B – Hot Mix Asphalt | <input type="checkbox"/> G50-B – Concrete Batch |
| <input type="checkbox"/> G30-D – Natural Gas Compressor Stations | <input type="checkbox"/> G60-C – Class II Emergency Generator |
| <input type="checkbox"/> G33-A – Spark Ignition Internal Combustion Engines | <input type="checkbox"/> G65-C – Class I Emergency Generator |
| <input type="checkbox"/> G35-A – Natural Gas Compressor Stations (Flare/Glycol Dehydration Unit) | <input checked="" type="checkbox"/> G70-A – Class II Oil and Natural Gas Production Facility |

SECTION I. GENERAL INFORMATION

1. Name of applicant (as registered with the WV Secretary of State's Office): EQT Production Company		2. Federal Employer ID No. (FEIN): 25-0724685	
3. Applicant's mailing address: 625 Liberty Avenue, Suite 1700 Pittsburgh, PA 15222		4. Applicant's physical address: West Union, Doddridge County, West Virginia	
5. If applicant is a subsidiary corporation, please provide the name of parent corporation:			
6. WV BUSINESS REGISTRATION. Is the applicant a resident of the State of West Virginia? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO – IF YES , provide a copy of the Certificate of Incorporation/ Organization / Limited Partnership (one page) including any name change amendments or other Business Registration Certificate as Attachment A . – IF NO , provide a copy of the Certificate of Authority / Authority of LLC / Registration (one page) including any name change amendments or other Business Certificate as Attachment A .			

SECTION II. FACILITY INFORMATION

7. Type of plant or facility (stationary source) to be constructed, modified, relocated or administratively updated (e.g., coal preparation plant, primary crusher, etc.): Natural gas production wellsite	8a. Standard Industrial Classification Classification (SIC) code: 1311	AND	8b. North American Industry System (NAICS) code: 211111
9. DAQ Plant ID No. (for existing facilities only): 017-00130	10. List all current 45CSR13 and other General Permit numbers associated with this process (for existing facilities only): G70-A099 _____ _____		

A: PRIMARY OPERATING SITE INFORMATION

11A. Facility name of primary operating site: WEU-51 Pad _____	12A. Address of primary operating site: Mailing: 625 Liberty Avenue, Suite 1700, Pittsburgh, PA 15222 Physical: _____	
13A. Does the applicant own, lease, have an option to buy, or otherwise have control of the proposed site? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO – IF YES, please explain: Property is leased and held under production rights _____ – IF NO, YOU ARE NOT ELIGIBLE FOR A PERMIT FOR THIS SOURCE.		
14A. – For Modifications or Administrative Updates at an existing facility, please provide directions to the present location of the facility from the nearest state road; – For Construction or Relocation permits, please provide directions to the proposed new site location from the nearest state road. Include a MAP as Attachment F . – 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		
15A. Nearest city or town: West Union	16A. County: Doddridge	17A. UTM Coordinates: Northing (KM): 4,345.203 Easting (KM): 520.425 Zone: 17
18A. Briefly describe the proposed new operation or change (s) to the facility: EQT is proposing to increase the liquid throughput currently permitted at the wellpad.		19A. Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits): Latitude: <u>39.25592°</u> Longitude: <u>-80.76326°</u>

B: 1ST ALTERNATE OPERATING SITE INFORMATION (only available for G20, G40, & G50 General Permits)

11B. Name of 1 st alternate operating site: _N/A_____ _____	12B. Address of 1 st alternate operating site: Mailing: _____ Physical: _____ _____
13B. Does the applicant own, lease, have an option to buy, or otherwise have control of the proposed site? <input type="checkbox"/> YES <input type="checkbox"/> NO – IF YES, please explain: _____ _____ – IF NO, YOU ARE NOT ELIGIBLE FOR A PERMIT FOR THIS SOURCE.	
14B. – For Modifications or Administrative Updates at an existing facility, please provide directions to the present location of the facility from the nearest state road; – For Construction or Relocation permits, please provide directions to the proposed new site location from the nearest state road. Include a MAP as Attachment F . _____ _____ _____	

15B. Nearest city or town:	16B. County:	17B. UTM Coordinates: Northing (KM): _____ Easting (KM): _____ Zone: _____
18B. Briefly describe the proposed new operation or change (s) to the facility:		19B. Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits): Latitude: _____ Longitude: _____

C: 2ND ALTERNATE OPERATING SITE INFORMATION (only available for G20, G40, & G50 General Permits):

11C. Name of 2 nd alternate operating site: _N/A_	12C. Address of 2 nd alternate operating site: Mailing: _____ Physical: _____
---	---

13C. Does the applicant own, lease, have an option to buy, or otherwise have control of the proposed site? YES NO

– IF YES, please explain: _____

– IF NO, YOU ARE NOT ELIGIBLE FOR A PERMIT FOR THIS SOURCE.

14C. – For **Modifications or Administrative Updates** at an existing facility, please provide directions to the present location of the facility from the nearest state road;

– For Construction or Relocation permits, please provide directions to the proposed new site location from the nearest state road. Include a **MAP as Attachment F.**

15C. Nearest city or town:	16C. County:	17C. UTM Coordinates: Northing (KM): _____ Easting (KM): _____ Zone: _____
----------------------------	--------------	---

18C. Briefly describe the proposed new operation or change (s) to the facility:	19C. Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits): Latitude: _____ Longitude: _____
---	--

20. Provide the date of anticipated installation or change: _6_ / _1_ / 2015_	21. Date of anticipated Start-up if registration is granted: _7_ / _1_ / 2015_
<input type="checkbox"/> If this is an After-The-Fact permit application, provide the date upon which the proposed change did happen: : _ / _ / _	

22. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application if other than 8760 hours/year. (Note: anything other than 24/7/52 may result in a restriction to the facility's operation).

Hours per day 24 Days per week 7 Weeks per year 52 Percentage of operation 100

SECTION III. ATTACHMENTS AND SUPPORTING DOCUMENTS

23. Include a check payable to WVDEP – Division of Air Quality with the appropriate **application fee** (per 45CSR22 and 45CSR13).

24. Include a **Table of Contents** as the first page of your application package.

All of the required forms and additional information can be found under the Permitting Section (General Permits) of DAQ's website, or requested by phone.

25. Please check all attachments included with this permit application. Please refer to the appropriate reference document for an explanation of the attachments listed below.

- ATTACHMENT A : CURRENT BUSINESS CERTIFICATE
- ATTACHMENT B: PROCESS DESCRIPTION
- ATTACHMENT C: DESCRIPTION OF FUGITIVE EMISSIONS
- ATTACHMENT D: PROCESS FLOW DIAGRAM
- ATTACHMENT E: PLOT PLAN
- ATTACHMENT F: AREA MAP
- ATTACHMENT G: EQUIPMENT DATA SHEETS AND REGISTRATION SECTION APPLICABILITY FORM
- ATTACHMENT H: AIR POLLUTION CONTROL DEVICE SHEETS
- ATTACHMENT I: EMISSIONS CALCULATIONS
- ATTACHMENT J: CLASS I LEGAL ADVERTISEMENT
- ATTACHMENT K: ELECTRONIC SUBMITTAL
- ATTACHMENT L: GENERAL PERMIT REGISTRATION APPLICATION FEE
- ATTACHMENT M: SITING CRITERIA WAIVER (*Not Applicable*)
- ATTACHMENT N: MATERIAL SAFETY DATA SHEETS (MSDS) (*Not Applicable*)
- ATTACHMENT O: EMISSIONS SUMMARY SHEETS
- OTHER SUPPORTING DOCUMENTATION NOT DESCRIBED ABOVE (Equipment Drawings, Aggregation Discussion, etc.) (*Not Applicable*)

Please mail an original and two copies of the complete General Permit Registration Application with the signature(s) to the DAQ Permitting Section, at the address shown on the front page of this application. Please DO NOT fax permit applications. For questions regarding applications or West Virginia Air Pollution Rules and Regulations, please refer to the website shown on the front page of the application or call the phone number also provided on the front page of the application.

SECTION IV. CERTIFICATION OF INFORMATION

This 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 a 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, Emission Inventory, Certified Emission Statement, 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 Registration Application will be returned to the applicant.

FOR A CORPORATION (domestic or foreign)

[X] I certify that I am a President, Vice President, Secretary, Treasurer or in charge of a principal business function of the corporation

FOR A PARTNERSHIP

[] I certify that I am a General Partner

FOR A LIMITED LIABILITY COMPANY

[] I certify that I am a General Partner or General Manager

FOR AN ASSOCIATION

[] I certify that I am the President or a member of the Board of Directors

FOR A JOINT VENTURE

[] I certify that I am the President, General Partner or General Manager

FOR A SOLE PROPRIETORSHIP

[] I certify that I am the Owner and Proprietor

[X] I hereby certify that (please print or type) 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 Office of Air Quality immediately, and/or,

I hereby certify that all information contained in this 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

Signature

(please use blue ink)

[Handwritten Signature]

Responsible Official

8/24/15

Date

Name & Title

(please print or type)

Kenneth Kirk, Executive Vice President

Signature

(please use blue ink)

Authorized Representative (if applicable)

Date

Applicant's Name

Alex Bosiljevac – Environmental Coordinator

Phone & Fax

412-395-3699

Phone

412-395-7027

Fax

Email

abosiljevac@eqt.com

ATTACHMENT A

Current 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.

ATTACHMENT B

Process Description

ATTACHMENT B: PROCESS DESCRIPTION

EQT is submitting this application to increase the liquid throughputs at the wellpad. There will be no physical changes to the equipment at the facility. Additionally, the application includes updated potential emissions using a site-specific extended condensate analysis.

The WEU-51 wellpad consists of seven wells. The incoming gas stream from the underground wells passes through a three phase separator which separates produced water and condensate from the gas stream. The produced water and condensate are transferred to the storage tanks, where vapors are controlled by one of two (2) enclosed combustors. Once the tanks are filled, the contents are loaded into trucks for transport using vapor-balanced loading. At the wellpad, heat is provided by line heaters and electricity is provided by thermoelectric generators.

A process flow diagram is included as Attachment D.

ATTACHMENT C

Description of Fugitive Emissions

G70-A FUGITIVE EMISSIONS SUMMARY SHEET

FUGITIVE EMISSIONS SUMMARY	All Regulated Pollutants - Chemical Name/CAS ¹	Maximum Potential Uncontrolled Emissions ²		Maximum Potential Controlled Emissions ³		Est. Method Used ⁴
		lb/hr	ton/yr	lb/hr	ton/yr	
Haul Road/Road Dust Emissions Paved Haul Roads	N/A	---	---	---	---	---
Unpaved Haul Roads	PM PM ₁₀ PM _{2.5}	1.26 0.32 0.03	5.53 1.41 0.14	1.26 0.32 0.03	5.53 1.41 0.14	O ^A
Loading/Unloading Operations	VOC HAP	1.18 0.03	5.16 0.12	0.40 0.01	1.73 0.04	O ^B
Equipment Leaks	VOC CO ₂ e HAP	Does not apply	12.01 846 0.50	Does not apply	12.01 846 0.50	O ^C
Blowdown Emissions	N/A	---	---	---	---	---
Other	N/A	---	---	---	---	---

^A AP-42, Section 13.2.2.

^B AP-42 Section 5.2.

^C Protocol for Equipment Leak Estimates (EPA-453/R-95-017), Table 2-1, Nov. 1995.

¹ List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS₂, VOCs, H₂S, Inorganics, Lead, Organics, O₃, NO, NO₂, SO₂, SO₃, all applicable Greenhouse Gases (including CO₂ and methane), etc. DO NOT LIST H₂, H₂O, N₂, O₂, and Noble Gases.

² Give rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

³ Give rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

⁴ Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; M = modeling; O = other (specify).

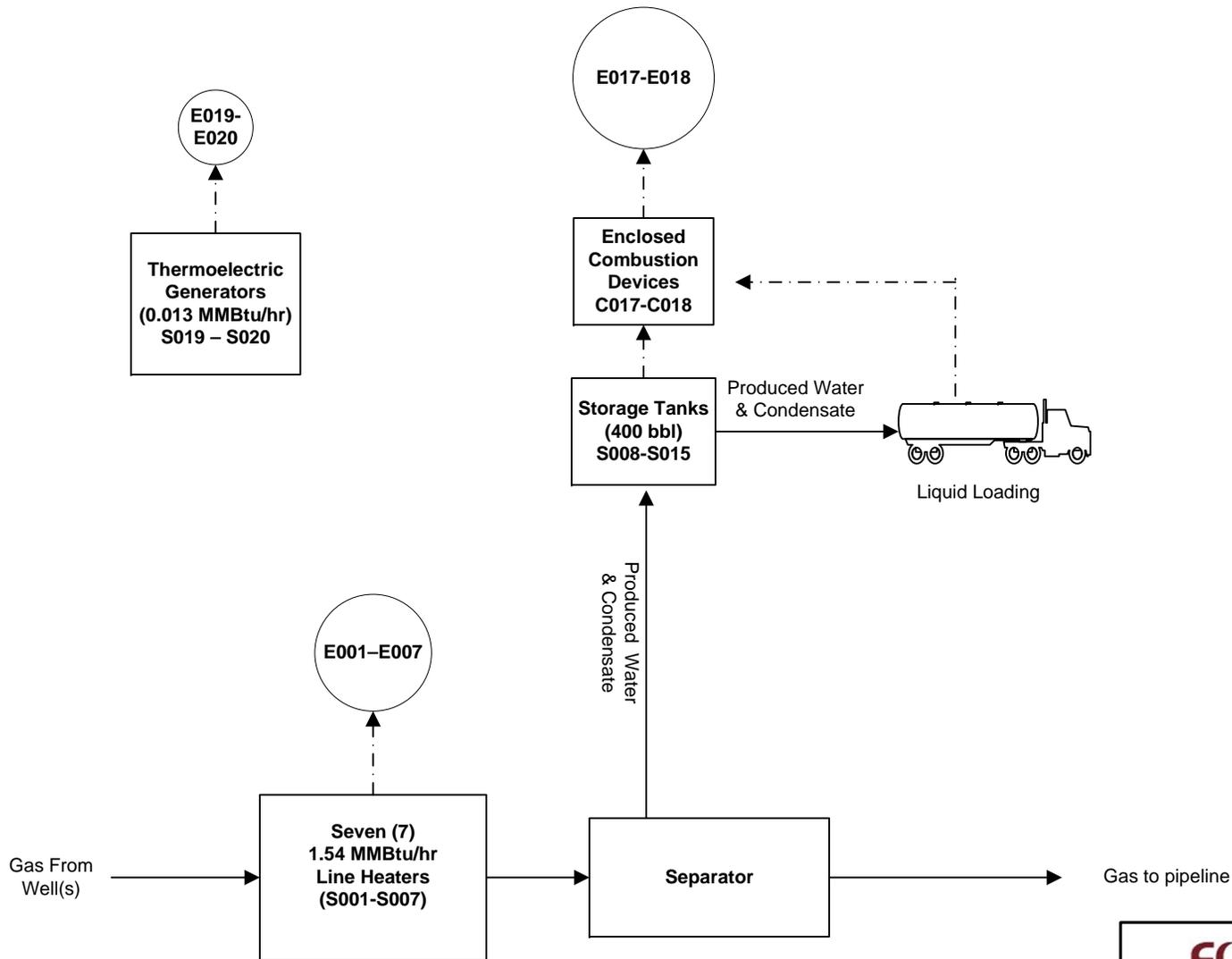
LEAK SOURCE DATA SHEET

Source Category	Pollutant	Number of Source Components	Number of Components Monitored by Frequency	Average Time to Repair (days)	Estimated Annual Emission Rate (lb/yr) ¹
Pumps	light liquid VOC	1	TBD	TBD	384
	heavy liquid VOC	---	TBD	TBD	---
	Non-VOC	---	TBD	TBD	---
Valves	Gas VOC	342	TBD	TBD	5,500
	Light Liquid VOC	---	TBD	TBD	---
	Heavy Liquid VOC	---	TBD	TBD	---
	Non-VOC	---	TBD	TBD	---
Safety Relief Valves	Gas VOC	39	TBD	TBD	10,927
	Non VOC	---	TBD	TBD	---
Open-ended Lines	VOC	18	TBD	TBD	82
	Non-VOC	---	TBD	TBD	---
Sampling Connections	VOC	---	TBD	TBD	---
	Non-VOC	---	TBD	TBD	---
Compressors	VOC	---	TBD	TBD	---
	Non-VOC	---	TBD	TBD	---
Flanges	VOC	1,444	TBD	TBD	7,119
	Non-VOC	---	TBD	TBD	---
Other	VOC	---	TBD	TBD	---
	Non-VOC	---	TBD	TBD	---

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). SOCMF factors were used as it was representative of natural gas liquids extraction

ATTACHMENT D

Process Flow Diagram



Flow Legend

- ▶ Gas/Water/Condensate Flow
- - -▶ Stack Emissions
- Emission Point

EQT Where energy meets innovation.

EQT Production

Process Flow Diagram

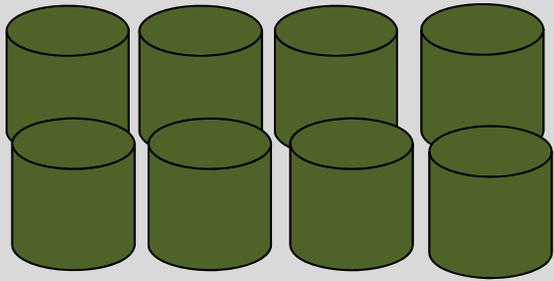
WEU-51 Wellpad

Trinity
Consultants

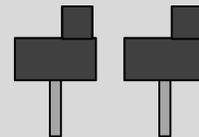
August 2015

ATTACHMENT E

Plot Plan



Tanks
400 bbl
(8)



Thermoelectric
Generators
(2)

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

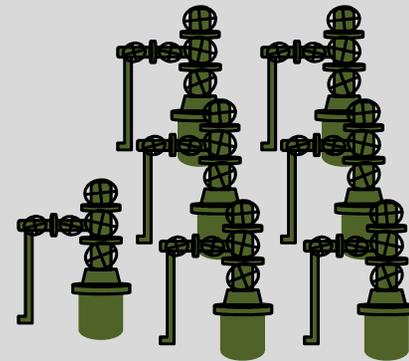
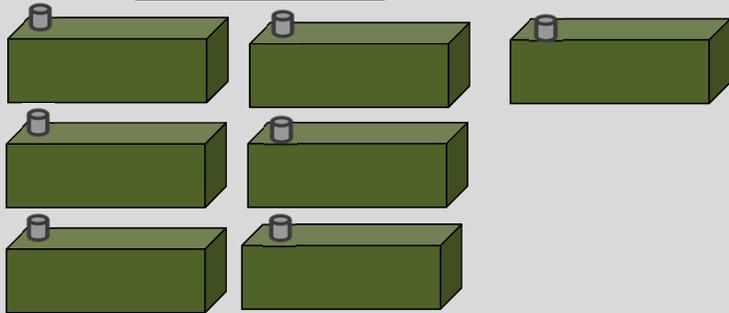


Combustor
11.66
MMBTU/hr



Combustor
11.66
MMBTU/hr

Line Heaters
(7)



Wellheads
(7)

Entrance to WEU-51 pad

ATTACHMENT F

Area Map

ATTACHMENT F: 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 G

Emission Unit Data Sheets and G70-A Section Applicability Form

General Permit G70-A Registration Section Applicability Form

General Permit G70-A was developed to allow qualified applicants to seek registration for a variety of sources. These sources include natural gas well affected facilities, storage tanks, natural gas-fired compressor engines (RICE), natural gas producing units, natural gas-fired in-line heaters, pneumatic controllers, heater treaters, tank truck loading, glycol dehydration units, 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-A 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.

Section 5	Natural Gas Well Affected Facility	<input checked="" type="checkbox"/>
Section 6	Storage Vessels*	<input checked="" type="checkbox"/>
Section 7	Gas Producing Units, In-Line Heaters, Heater Treaters, and Glycol Dehydration Reboilers	<input checked="" type="checkbox"/>
Section 8	Pneumatic Controllers Affected Facility (NSPS, Subpart OOOO)	<input type="checkbox"/>
Section 9	<i>Reserved</i>	<input type="checkbox"/>
Section 10	Natural gas-fired Compressor Engine(s) (RICE) **	<input type="checkbox"/>
Section 11	Tank Truck Loading Facility ***	<input checked="" type="checkbox"/>
Section 12	Standards of Performance for Storage Vessel Affected Facilities (NSPS, Subpart OOOO)	<input type="checkbox"/>
Section 13	Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (NSPS, Subpart JJJJ)	<input type="checkbox"/>
Section 14	Control Devices not subject to NSPS, Subpart OOOO	<input checked="" type="checkbox"/>
Section 15	National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (40CFR63, Subpart ZZZZ)	<input type="checkbox"/>
Section 16	Glycol Dehydration Units	<input type="checkbox"/>
Section 17	Dehydration Units With Exemption from NESHAP Standard, Subpart HH § 63.764(d) (40CFR63, Subpart HH)	<input type="checkbox"/>
Section 18	Dehydration Units Subject to NESHAP Standard, Subpart HH and Not Located Within an UA/UC (40CFR63, Subpart HH)	<input type="checkbox"/>
Section 19	Dehydration Units Subject to NESHAP Standard, Subpart HH and Located Within an UA/UC (40CFR63, Subpart HH)	<input type="checkbox"/>

* Applicants that are subject to Section 6 may also be subject to Section 12 if the applicant is subject to the NSPS, Subpart OOOO control requirements or the applicable control device requirements of Section 14.

** Applicants that are subject to Section 10 may also be subject to the applicable RICE requirements of Section 13 and/or Section 15.

*** Applicants that are subject to Section 11 may also be subject to control device requirements of Section 14.

Emission Units Table (includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)						
Emission Unit ID ¹	Emission Point ID ²	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type ³ and Date of Change	Control Device ⁴
S008	E017, E018	Produced Fluid Storage Tank	2015	400 bbl	Existing; Increase throughput	C017, C018
S009	E017, E018	Produced Fluid Storage Tank	2015	400 bbl	Existing; Increase throughput	C017, C018
S010	E017, E018	Produced Fluid Storage Tank	2015	400 bbl	Existing; Increase throughput	C017, C018
S011	E017, E018	Produced Fluid Storage Tank	2015	400 bbl	Existing; Increase throughput	C017, C018
S012	E017, E018	Produced Fluid Storage Tank	2015	400 bbl	Existing; Increase throughput	C017, C018
S013	E017, E018	Produced Fluid Storage Tank	2015	400 bbl	Existing; Increase throughput	C017, C018
S014	E017, E018	Produced Fluid Storage Tank	2015	400 bbl	Existing; Increase throughput	C017, C018
S015	E017, E018	Produced Fluid Storage Tank	2015	400 bbl	Existing; Increase throughput	C017, C018
S001	E001	Line Heater	2015	1.54 MMBtu/hr	Existing	None
S002	E002	Line Heater	2015	1.54 MMBtu/hr	Existing	None
S003	E003	Line Heater	2015	1.54 MMBtu/hr	Existing	None
S004	E004	Line Heater	2015	1.54 MMBtu/hr	Existing	None
S005	E005	Line Heater	2015	1.54 MMBtu/hr	Existing	None
S006	E006	Line Heater	2015	1.54 MMBtu/hr	Existing	None
S007	E007	Line Heater	2015	1.54 MMBtu/hr	Existing	None
S019	E019	Thermoelectric Generator	2015	0.013 MMBtu/hr	Existing	None
S020	E020	Thermoelectric Generator	2015	0.013 MMBtu/hr	Existing	None
S016	E017, E018	Liquid Loading	2015	30,000,000 Gal/yr	Existing; Increase throughput	None
S017	E017	Combustor	2015	11.66 MMBTU/hr	Existing	NA
S018	E018	Combustor	2015	11.66 MMBTU/hr	Existing	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.
³ New, modification, removal
⁴ For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.

NATURAL 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).

Please provide the API number(s) for each NG well at this facility:	
47-017-06381	
47-017-06386	
47-017-06385	
47-017-06384	
47-017-06383	
47-017-06575	
47-017-06385	

Note: This is the same API 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 (American Petroleum Institute) 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.

STORAGE VESSEL EMISSION UNIT DATA SHEET

Provide the following information for each new or modified bulk liquid storage tank.

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name WEU-51 Wellpad	2. Tank Name Produced Fluid Storage Tanks
3. Emission Unit ID number S008 – S015	4. Emission Point ID number E017 – E018
5. Date Installed or Modified (<i>for existing tanks</i>) 2015	6. Type of change: <input type="checkbox"/> New construction <input type="checkbox"/> New stored material <input checked="" type="checkbox"/> Other
7A. Description of Tank Modification (<i>if applicable</i>) Increase produced fluid	
7B. Will more than one material be stored in this tank? <i>If so, a separate form must be completed for each material.</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
7C. Provide any limitations on source operation affecting emissions. (production variation, etc.) None	

II. TANK INFORMATION (required)

8. Design Capacity (<i>specify barrels or gallons</i>). Use the internal cross-sectional area multiplied by internal height. <div style="text-align: center;">400 bbl</div>	
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 (<i>specify barrels or gallons</i>). This is also known as “working volume. 400 bbl	
13A. Maximum annual throughput (gal/yr) ~30,000,000 (All tanks: S008-S015)	13B. Maximum daily throughput (gal/day) ~82,192 (All tanks: S008-S015)
14. Number of tank turnovers per year ~1,786 (All tanks)	15. Maximum tank fill rate (gal/min) TBD
16. Tank fill method <input type="checkbox"/> Submerged <input checked="" type="checkbox"/> Splash <input type="checkbox"/> Bottom Loading	
17. Is the tank system a variable vapor space system? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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): <input checked="" type="checkbox"/> Fixed Roof <input checked="" type="checkbox"/> vertical ___ horizontal ___ flat roof <input checked="" type="checkbox"/> cone roof ___ dome roof ___ other (describe) <input type="checkbox"/> External Floating Roof ___ pontoon roof ___ double deck roof <input type="checkbox"/> Domed External (or Covered) Floating Roof <input type="checkbox"/> Internal Floating Roof ___ vertical column support ___ self-supporting <input type="checkbox"/> Variable Vapor Space ___ lifter roof ___ diaphragm <input type="checkbox"/> Pressurized ___ spherical ___ cylindrical <input type="checkbox"/> Underground <input type="checkbox"/> Other (describe)	

III. TANK CONSTRUCTION AND OPERATION INFORMATION (*check which one applies*)

<input type="checkbox"/> Refer to enclosed TANKS Summary Sheets
<input checked="" type="checkbox"/> Refer to the responses to items 19 – 26 in section VII

IV. SITE INFORMATION (*check which one applies*)

<input type="checkbox"/> Refer to enclosed TANKS Summary Sheets
<input checked="" type="checkbox"/> Refer to the responses to items 27 – 33 in section VII

G70-A Oil and Natural Gas Production Facilities
Instructions and Forms

25E. Is the floating roof equipped with a weather shield? <input type="checkbox"/> Yes <input type="checkbox"/> No			
25F. Describe deck fittings:			
26. Complete the following section for Internal Floating Roof Tanks <input checked="" type="checkbox"/> Does not apply			
26A. Deck Type: <input type="checkbox"/> Bolted <input type="checkbox"/> Welded		26B. For bolted decks, provide deck construction:	
26C. Deck seam. Continuous sheet construction: <input type="checkbox"/> 5 ft. wide <input type="checkbox"/> 6 ft. wide <input type="checkbox"/> 7 ft. wide <input type="checkbox"/> 5 x 7.5 ft. wide <input type="checkbox"/> 5 x 12 ft. wide <input type="checkbox"/> 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:
SITE INFORMATION:			
27. Provide the city and state on which the data in this section are based: Elkins, WV			
28. Daily Avg. Ambient Temperature (°F): 49.06		29. Annual Avg. Maximum Temperature (°F): 61.15	
30. Annual Avg. Minimum Temperature (°F): 39.97		31. Avg. Wind Speed (mph): 6.17	
32. Annual Avg. Solar Insulation Factor (BTU/ft ² -day): 1,193.87		33. Atmospheric Pressure (psia): 13.73	
LIQUID INFORMATION:			
34. Avg. daily temperature range of bulk liquid (°F): 51.30	34A. Minimum (°F):	34B. Maximum (°F):	
35. Avg. operating pressure range of tank (psig): -0.03 to 0.70	35A. Minimum (psig): -0.03	35B. Maximum (psig): 0.70	
36A. Minimum liquid surface temperature (°F): 46.54		36B. Corresponding vapor pressure (psia): 0.2333	
37A. Avg. liquid surface temperature (°F): 55.41		37B. Corresponding vapor pressure (psia): 0.2992	
38A. Maximum liquid surface temperature (°F): 64.27		38B. Corresponding vapor pressure (psia): 0.3822	
39. Provide the following for each liquid or gas to be stored in the tank. Add additional pages if necessary.			
39A. Material name and composition:	Produced Fluid		
39B. CAS number:	TBD		
39C. Liquid density (lb/gal):	TBD		
39D. Liquid molecular weight (lb/lb-mole):	TBD		
39E. Vapor molecular weight (lb/lb-mole):	25.48		
39F. Maximum true vapor pressure (psia):	TBD		
39G. Maxim Reid vapor pressure (psia):	TBD		
39H. Months Storage per year. From: To:	12 (All year)		

NATURAL GAS FIRED FUEL BURNING UNITS EMISSION DATA SHEET

Complete the information on this data for each Gas Producing Unit(s), Heater Treater(s), and in-line heater(s) at the production pad. Reboiler information should be entered on the Glycol Dehydration Emission Unit Data Sheet.

Emission Unit ID # ¹	Emission Point ID# ²	Emission Unit Description (Manufacturer / Model #)	Year Installed/ Modified	Type ³ and Date of Change	Control Device ⁴	Design Heat Input (mmBtu/hr) ⁵	Fuel Heating Value (Btu/scf) ⁶
S001	E001	Line Heater	2015	Existing	None	1.54	~1,217
S002	E002	Line Heater	2015	Existing	None	1.54	~1,217
S003	E003	Line Heater	2015	Existing	None	1.54	~1,217
S004	E004	Line Heater	2015	Existing	None	1.54	~1,217
S005	E005	Line Heater	2015	Existing	None	1.54	~1,217
S006	E006	Line Heater	2015	Existing	None	1.54	~1,217
S007	E007	Line Heater	2015	Existing	None	1.54	~1,217
S019	E019	Thermoelectric Generator	2015	Existing	None	0.013	~1,217
S020	E020	Thermoelectric Generator	2015	Existing	None	0.013	~1,217

¹ Enter the appropriate Emission Unit (or Sources) 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 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 Complete appropriate air pollution control device sheet for any control device.

⁵ Enter design heat input capacity in mmBtu/hr.

⁶ Enter the fuel heating value in Btu/standard cubic foot.

TANK TRUCK LOADING EMISSION UNIT DATA SHEET

Furnish the following information for each new or modified bulk liquid transfer area or loading rack at the natural gas production pad. This form is to be used for bulk liquid transfer operations to tank trucks.

1. Emission Unit ID: S016	2. Emission Point ID: E017, E018	3. Year Installed/ Modified: Installed 2015		
4. Emission Unit Description: Liquid Loading				
5. Loading Area Data:				
5A. Number of pumps: 1	5B. Number of liquids loaded: 1	5C. Maximum number of tank trucks loading at one time: 1		
6. Describe cleaning location, compounds and procedure for tank trucks:				
7. Are tank trucks pressure tested for leaks at this or any other location? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If YES, describe:				
8. Projected Maximum Operating Schedule (for rack or transfer point as a whole):				
Maximum	Jan. - Mar.	Apr. - June	July - Sept.	Oct. - Dec.
hours/day	As needed	As needed	As needed	As needed
days/week	As needed	As needed	As needed	As needed

9. Bulk Liquid Data <i>(add pages as necessary)</i> :			
Liquid Name	Produced Fluids		
Max. daily throughput (1000 gal/day)	Variable		
Max. annual throughput (gal/yr)	30,000,000		
Loading Method ¹	SP		
Max. Fill Rate (gal/min)	TBD		
Average Fill Time (min/loading)			
Max. Bulk Liquid Temperature (°F)	51.30		
True Vapor Pressure ²	0.3822		
Cargo Vessel Condition ³	Unknown		
Control Equipment or Method ⁴	VB		
Minimum collection efficiency (%)	70		
Minimum control efficiency (%)	95		
<i>* Continued on next page</i>			

Maximum Emission Rate	Loading (lb/hr)	VOC: 0.40 HAP: 0.01		
	Annual (ton/yr)	VOC: 1.73 HAP: 0.04		
Estimation Method ⁵		EPA		
Notes:				
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 <i>Air Pollution Control Device Sheets as Attachment "H"</i>): CA = Carbon Adsorption VB = Dedicated Vapor Balance (closed system) ECD = Enclosed Combustion Device F = Flare TO = Thermal Oxidation or Incineration				
⁵ EPA = EPA Emission Factor as stated in AP-42 MB = Material Balance TM = Test Measurement based upon test data submittal O = other (describe)				

10. Proposed Monitoring, Recordkeeping, Reporting, and Testing Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.	
MONITORING <i>Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment operation/air pollution control device.</i> Liquid Throughput Loaded (gal/yr)	RECORDKEEPING <i>Please describe the proposed recordkeeping that will accompany the monitoring.</i> None
REPORTING <i>Please describe the proposed frequency of reporting of the recordkeeping.</i> None	TESTING <i>Please describe any proposed emissions testing for this process equipment/air pollution control device.</i> None
11. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty: N/A	

ATTACHMENT H

Air Pollution Control Device Data Sheets

AIR POLLUTION CONTROL DEVICE

Vapor Combustion Control Device Sheet

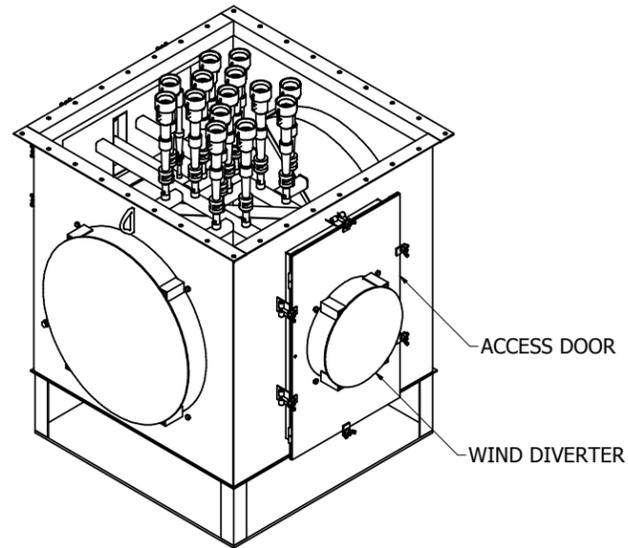
Complete this vapor combustion control device sheet for each enclosed combustion device, flare, thermal oxidizer, or completion combustion device that is located at the natural gas production pad for the purpose of thermally destructing waste gas to control emissions of regulated pollutants to the atmosphere.

IMPORTANT: READ THE INSTRUCTIONS ACCOMPANYING THIS FORM BEFORE COMPLETING.			
General Information			
1. Control Device ID#: C017 & C018		2. Installation Date: 2015 <input checked="" type="checkbox"/> New	
3. Maximum Rated Total Flow Capacity: ~131 scf/min ~188,380 scfd	4. Maximum Design Heat Input: 11.66 MMBtu/hr	5. Design Heat Content: ~1,217 BTU/scf	
Control Device Information			
6. Select the type of vapor combustion control device being used: <input checked="" type="checkbox"/> Enclosed Combustion Device <input type="checkbox"/> Elevated Flare <input type="checkbox"/> Ground Flare <input type="checkbox"/> Thermal Oxidizer <input type="checkbox"/> Completion Combustion Device			
7. Manufacturer: LEED Fabrication Model No.: Enclosed Combustor 48"		8. Hours of operation per year: 8760	
9. List the emission units whose emissions are controlled by this vapor combustion control device: (Emission Point ID#: E017, E018)			
10. Emission Unit ID#	Emission Source Description:	Emission Unit ID#	Emission Source Description:
S008 – S015	Eight (8) 400 bbl Produced Fluids Tank		
S016	Tank Truck Loading		
<i>If this vapor combustor controls emissions from more than six emission units, please attach additional pages.</i>			
11. Assist Type		12. Flare Height	13. Tip Diameter
<input type="checkbox"/> Steam - <input type="checkbox"/> Air - <input type="checkbox"/> Pressure - <input checked="" type="checkbox"/> Non -		~25 ft	~4 ft
14. Was the design per §60.18? <input type="checkbox"/> Yes <input type="checkbox"/> No NA			
Waste Gas Information			
15. Maximum waste gas flow rate (scfm):	16. Heat value of waste gas stream (BTU/ft3)	17. Temperature of the emissions stream (°F)	18. Exit Velocity of the emissions stream (scf/min)
~131	Variable	~70	
19. Provide an attachment with the characteristics of the waste gas stream to be burned. <i>See attached emission calculations.</i>			

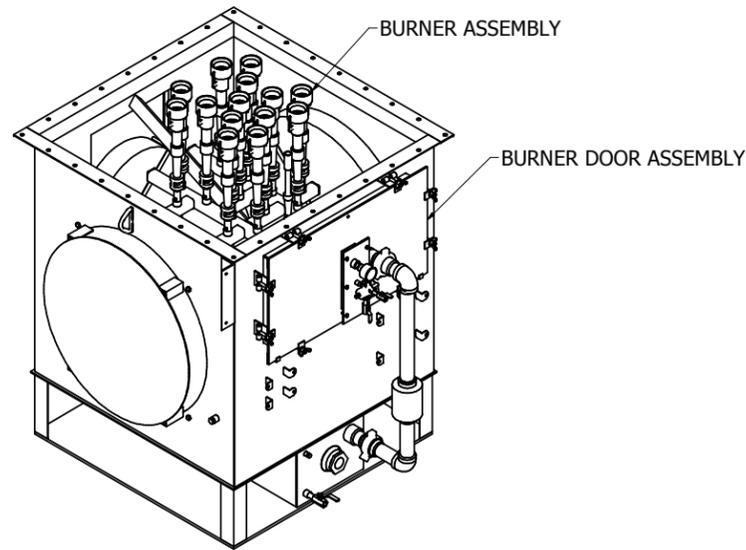
Pilot Information				
20. Type/Grade of pilot fuel:	21. Number of pilot lights:	22. Fuel flow rate to pilot flame per pilot (scf/hr):	23. Heat input per pilot (BTU/hr):	24. Will automatic re-ignition be used?
Pipeline quality natural gas	1	~22	26,335	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
25. If automatic re-ignition will be used, describe the method: NA				
26. Describe the method of controlling flame: Three flame cells to stop the main flame front; One 2" flame arrestor on piping from drip pot to burner assembly.				
27. Is pilot flame equipped with a monitor to detect the presence of the flame? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		28. If yes, what type? <input checked="" type="checkbox"/> Thermocouple <input type="checkbox"/> Infra-Red <input type="checkbox"/> Ultra Violet <input type="checkbox"/> Camera with monitoring control room <input type="checkbox"/> Other, describe:		

29. Pollutant(s) Controlled	30. % Capture Efficiency	31. Manufacturer's Guaranteed Control Efficiency (%)
HC	95	≥ 98
VOC	95	≥ 98
HAP	95	≥ 98
32. Has the control device been tested by the manufacturer and certified?		
33. Describe all operating ranges and maintenance procedures required by the manufacturer to maintain warranty: See attached specification sheet.		
34. Additional Information Attached? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		
<i>Please attach a copy of manufacturer's data sheet.</i> <i>Please attach a copy of manufacturer's drawing.</i> <i>Please attach a copy of the manufacturer's performance testing.</i>		

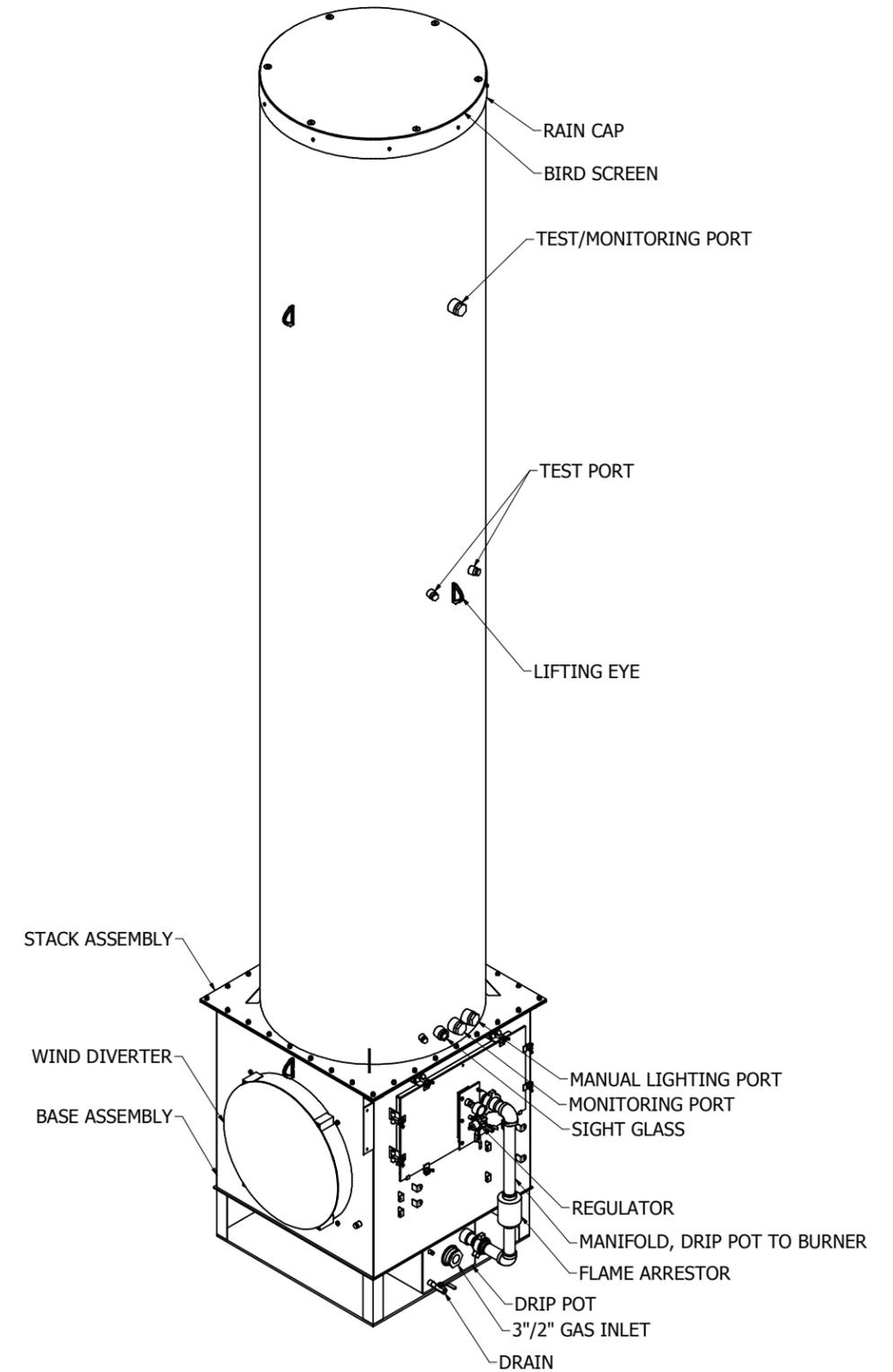
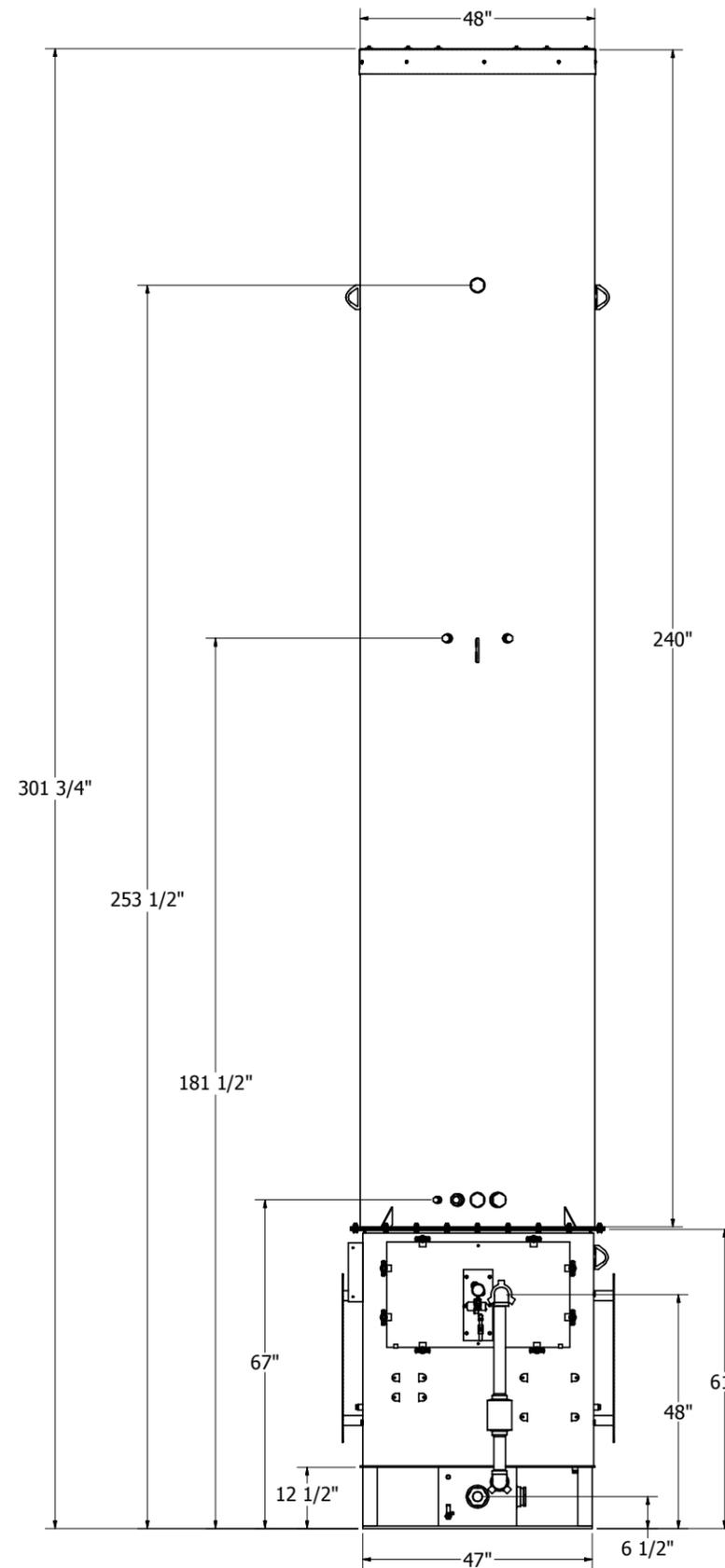
If any of the requested information is not available, please contact the manufacturer.



BASE ASSEMBLY
BACK ISOMETRIC VIEW



BASE ASSEMBLY
FRONT ISOMETRIC VIEW



REVISIONS		BY	DATE
△			
△			
△			
△			
△	INITIAL RELEASE	BDM	12/09/11
△	DESCRIPTION		

LEED FABRICATION

LEED FABRICATION SERVICES
12535 WCR#2 PHONE: 303 / 659 - 6801
BRIGHTON, CO 80601 FAX: 303 / 659 - 6808

GREELEY OFFICE:
527 6TH AVENUE PHONE: 970 / 378 - 1172
GREELEY, CO 80631 FAX: 970 / 378 - 1174

THIS DRAWING WAS ORIGINATED BY AND IS THE EXCLUSIVE AND PROPRIETARY PROPERTY OF LEED FABRICATION SERVICES, INC. IT MAY NOT BE DISCLOSED, REPRODUCED OR USED, IN WHOLE OR IN PART WITHOUT OUR WRITTEN CONSENT. ALL DATA SHOWN IS CONFIDENTIAL AND ALL RIGHTS, PATENTS AND OTHERWISE ARE RESERVED BY LEED FABRICATION SERVICES, INC. DRAWINGS SHALL BE SURRENDERED UPON REQUEST.

MATERIAL:	
STOCK:	
WEIGHT:	5089 lbmass
DRAWING APPROVED BY:	
CUSTOMER	MECHANICAL ENGINEER
SIGNATURE	QUALITY ASSURANCE
DATE	

EF-48-ICD			
DRAWN / DATE	SCALE	DRAWING TYPE:	DRAWING NUMBER
12/9/2011	AS NOTED	WELDMENT	EF-48-ICD
DRAWN BY	ENGINEER	SHEET 1 OF 1	REV 1.0
BDM	CB		



Enclosed (Passive Swirl) Flare Flow Rates

$$Q = \left[C_d A \cdot \sqrt{\frac{2 \left(\frac{P}{16} \right) R}{\rho}} \right] N$$

Convert to mSCFD
 $(Q \cdot M \cdot 24) / 1000$

3/8" Orifice: Dia = 0.00635 m
 Area = 3.16692E-05 m²
 Cd = 1
 Density = 0.8 kg/m³
 6894.757 Conversion from PSI to Pa (R)
 127132.8 m³/s to ft³/hr (M)

Flare Size	# of Orifices (N)	Pressure (OZ/in ²)	m ³ /s	mSCFD	99% Combustion Efficiency
18	2	1	0.00207892	6.34316015	6.28
18	2	2	0.00294003	8.97058312	8.88
18	2	3	0.00360079	10.98667566	10.88
18	2	4	0.00415783	12.68632031	12.56
18	2	5	0.00464860	14.18373729	14.04
18	2	6	0.00509228	15.53750573	15.38
18	2	7	0.00550029	16.78242429	16.61
18	2	8	0.00588006	17.94116623	17.76
18	2	9	0.00623675	19.02948046	18.84
18	2	10	0.00657411	20.05883365	19.86
18	2	11	0.00689498	21.03788221	20.83
18	2	12	0.00720157	21.97335133	21.75
18	2	13	0.00749564	22.87058918	22.64
18	2	14	0.00777859	23.73393204	23.50
18	2	15	0.00805160	24.56695363	24.32
18	2	16	0.00831566	25.37264061	25.12
18	2	17	0.00857159	26.15351931	25.89
18	2	18	0.00882009	26.91174935	26.64
24	4	1	0.00415783	12.68632031	12.56
24	4	2	0.00588006	17.94116623	17.76
24	4	3	0.00720157	21.97335133	21.75
24	4	4	0.00831566	25.37264061	25.12
24	4	5	0.00929719	28.36747459	28.08
24	4	6	0.01018456	31.07501146	30.76
24	4	7	0.01100059	33.56484858	33.23
24	4	8	0.01176012	35.88233246	35.52
24	4	9	0.01247349	38.05896092	37.68
24	4	10	0.01314822	40.11766729	39.72
24	4	11	0.01378996	42.07576442	41.66
24	4	12	0.01440315	43.94670266	43.51
24	4	13	0.01499127	45.74117836	45.28
24	4	14	0.01555718	47.46786408	46.99
24	4	15	0.01610321	49.13390727	48.64
24	4	16	0.01663132	50.74528122	50.24
24	4	17	0.01714318	52.30703862	51.78
24	4	18	0.01764018	53.82349870	53.29
36	10	1	0.01039458	31.71580076	31.40
36	10	2	0.01470015	44.85291558	44.40
36	10	3	0.01800394	54.93337832	54.38
36	10	4	0.02078915	63.43160153	62.80
36	10	5	0.02324298	70.91868647	70.21
36	10	6	0.02546141	77.68752865	76.91
36	10	7	0.02750147	83.91212145	83.07

36	10	8	0.02940030	89.70583116	88.81
36	10	9	0.03118373	95.14740229	94.20
36	10	10	0.03287054	100.29416823	99.29
36	10	11	0.03447491	105.18941106	104.14
36	10	12	0.03600787	109.86675665	108.77
36	10	13	0.03747818	114.35294589	113.21
36	10	14	0.03889295	118.66966020	117.48
36	10	15	0.04025802	122.83476817	121.61
36	10	16	0.04157831	126.86320305	125.59
36	10	17	0.04285794	130.76759655	129.46
36	10	18	0.04410046	134.55874674	133.21
48	14	1	0.01455241	44.40212107	43.96
48	14	2	0.02058021	62.79408181	62.17
48	14	3	0.02520551	76.90672965	76.14
48	14	4	0.02910482	88.80424214	87.92
48	14	5	0.03254017	99.28616105	98.29
48	14	6	0.03564597	108.76254012	107.67
48	14	7	0.03850205	117.47697003	116.30
48	14	8	0.04116043	125.58816363	124.33
48	14	9	0.04365722	133.20636321	131.87
48	14	10	0.04601875	140.41183552	139.01
48	14	11	0.04826488	147.26517548	145.79
48	14	12	0.05041102	153.81345931	152.28
48	14	13	0.05246945	160.09412425	158.49
48	14	14	0.05445012	166.13752428	164.48
48	14	15	0.05636123	171.96867543	170.25
48	14	16	0.05820963	177.60848427	175.83
48	14	17	0.06000112	183.07463517	181.24
48	14	18	0.06174064	188.38224544	186.50

ATTACHMENT I

Emission Calculations

Company Name: EQT Production, LLC
Facility Name: WEU 51 Wellpad
Project Description: G70A Modification Application

Site Wide Summary

Emission Source	Value	Units	Emission Unit ID(s)	Emission Point ID(s)	Control Device
Well(s)	7	per pad	---	---	---
Storage Tank(s) (400 bbl)	8	per pad	S008 - S015	E017-E018	C017-C018
Sand Separator Tank	0	per pad	---	---	None
Line Heater(s) (1.54 MMBtu/hr)	7	per pad	S001 - S007	E001 - E007	None
Thermoelectric Generator(s) (TEGs)	2	per pad	S019 - S020	E019 - E020	None
Dehydrator(s)	0	per pad	---	---	---
Reboiler(s)	0	per pad	---	---	---
Dehy Drip Tank	0	per pad	---	---	---
Tank Combustor(s)	2	per pad	C017-C018	E017-E018	---
Dehy Combustor(s)	0	per pad	---	---	N/A
Length of lease road	900	feet	---	---	---

Constituent	Produced from Storage Tanks (Includes Two Combustors) (tpy)	Line Heaters (1.54 MMBtu/hr) (tpy)	TEGs (tpy)	Fugitive Components (tpy)	Liquid Loading (tpy)	Haul Roads (tpy)	Total Emissions (tpy)
Criteria Pollutants							
NO _x	8.42	3.88	0.01	---	---	---	12.31
CO	7.07	3.26	0.01	---	---	---	10.34
PM Total	0.64	0.29	7.1E-04	---	---	5.53	6.46
PM ₁₀ Total	0.64	0.29	7.1E-04	---	---	1.41	2.34
PM _{2.5} Total	0.64	0.29	7.1E-04	---	---	0.14	1.08
SO ₂	0.05	0.02	5.6E-05	---	---	---	0.07
VOC	17.41	0.21	5.1E-04	12.01	1.73	---	31.36
Greenhouse Gases							
CO ₂	11977.28	5,524.19	13.28	0.28	---	---	17,515
CH ₄	10.03	0.10	2.5E-04	33.81	---	---	43.94
N ₂ O	0.02	0.01	2.5E-05	---	---	---	0.03
CO ₂ e	12234.65	5,529.90	13.29	845.56	---	---	18,623
Hazardous Air Pollutants							
Methylnaphthalene (2-)	---	9.3E-07	2.2E-09	---	---	---	9.3E-07
Methylchloranthrene (3-)	---	7.0E-08	1.7E-10	---	---	---	7.0E-08
Dimethylbenz(a)anthracene (7,12-)	---	6.2E-07	1.5E-09	---	---	---	6.2E-07
Acenaphthene	---	7.0E-08	1.7E-10	---	---	---	7.0E-08
Acenaphthylene	---	7.0E-08	1.7E-10	---	---	---	7.0E-08
Anthracene	---	9.3E-08	2.2E-10	---	---	---	9.3E-08
Benz(a)anthracene	---	7.0E-08	1.7E-10	---	---	---	7.0E-08
Benzene	8.0E-03	8.2E-05	2.0E-07	6.64E-03	8.6E-04	---	1.6E-02
Benzo(a)pyrene	---	4.7E-08	1.1E-10	---	---	---	4.7E-08
Benzo(b)fluoranthene	---	7.0E-08	1.7E-10	---	---	---	7.0E-08
Benzo(g,h,i)perylene	---	4.7E-08	1.1E-10	---	---	---	4.7E-08
Benzo(k)fluoranthene	---	7.0E-08	1.7E-10	---	---	---	7.0E-08
Chrysene	---	7.0E-08	1.7E-10	---	---	---	7.0E-08
Dibenzo(a,h)anthracene	---	4.7E-08	1.1E-10	---	---	---	4.7E-08
Dichlorobenzene	---	4.7E-05	1.1E-07	---	---	---	4.7E-05
Fluoranthene	---	1.2E-07	2.8E-10	---	---	---	1.2E-07
Fluorene	---	1.1E-07	2.6E-10	---	---	---	1.1E-07
Formaldehyde	---	2.9E-03	7.0E-06	---	---	---	2.9E-03
Hexane, n-	5.3E-01	7.0E-02	1.7E-04	2.01E-01	3.6E-02	---	8.4E-01
Indeno(1,2,3-cd)pyrene	---	7.0E-08	1.7E-10	---	---	---	7.0E-08
Naphthalene	---	2.4E-05	5.7E-08	---	---	---	2.4E-05
Phenanthrene	---	6.6E-07	1.6E-09	---	---	---	6.6E-07
Pyrene	---	1.9E-07	4.7E-10	---	---	---	1.9E-07
Toluene	8.0E-03	1.3E-04	3.2E-07	1.96E-02	1.6E-03	---	2.9E-02
Arsenic	---	7.8E-06	1.9E-08	---	---	---	7.8E-06
Beryllium	---	4.7E-07	1.1E-09	---	---	---	4.7E-07
Cadmium	---	4.3E-05	1.0E-07	---	---	---	4.3E-05
Chromium	---	5.4E-05	1.3E-07	---	---	---	5.4E-05
Cobalt	---	3.3E-06	7.8E-09	---	---	---	3.3E-06
Manganese	---	1.5E-05	3.5E-08	---	---	---	1.5E-05
Mercury	---	1.0E-05	2.4E-08	---	---	---	1.0E-05
Nickel	---	8.2E-05	2.0E-07	---	---	---	8.2E-05
Selenium	---	9.3E-07	2.2E-09	---	---	---	9.3E-07
Ethylbenzene	<0.001	---	---	<0.001	9.1E-05	---	9.1E-05
Trimethylpentane (2,2,4-)	<0.001	---	---	2.52E-01	7.7E-05	---	2.5E-01
Xylene	8.0E-03	---	---	2.26E-02	1.2E-03	---	3.2E-02
Total HAP	0.55	0.07	1.8E-04	0.50	0.04	---	1.17

Company Name: EQT Production, LLC
Facility Name: WEU 51 Wellpad
Project Description: G70A Modification Application

Produced Fluid Storage Tanks

Throughput Parameter	Value	Units
Operational Hours	8,760	hrs/yr
Total Produced Fluid Throughput for E&P ¹	26.75	bbbl/day (per tank)
Total Condensate Throughput ³	5,952	bbbl/month
Total Produced Water Throughput	53,571	bbbl/month

Description	Potential Throughput ^{1,2} (gal/yr)
Produced Water and Condensate	30,000,000

¹ For the purposes of establishing PTE, produced water is conservatively assumed to contain 1% condensate. E&P Tank throughput is on a per-tank basis.
² Based on maximum historical produced water and condensate throughput for WEU-51 wellpad.
³ Produced fluid is conservatively assumed to contain 10% condensate, based on historical production data at the wellpad.

Storage Tanks (400 bbl, each) - Uncontrolled (Per tank)

Constituent	Total Emissions ¹	
	lb/hr	tpy
Methane	3.994	17.495
Ethane	4.751	20.809
Propane	3.763	16.483
Isobutane	0.713	3.125
n-Butane	1.399	6.127
Isopentane	0.390	1.707
n-Pentane	0.344	1.508
n-Hexane	0.216	0.948
Cyclohexane	<0.001	<0.001
Other Hexanes	<0.001	<0.001
Heptanes	0.192	0.839
Benzene	0.003	0.013
Toluene	0.003	0.015
Ethylbenzene	<0.001	<0.001
Xylenes	0.004	0.017
2,2,4-Trimethylpentane	<0.001	<0.001
C8+ Heavies	0.070	0.305
Total Emissions:	16.322	71.491
Total VOC Emissions:	7.097	31.087
Total HAP Emissions:	0.226	0.990

¹ E&P TANK v2.0 calculates working, breathing and flashing losses and reports the sum as one total.
² E&P TANK v2.0 emission calculations are based on 06/22/2015 condensate sample from WEU 51 wellpad.

Control Efficiency of Combustor	93%	95% Capture, 98% control guaranteed efficiency for Leed Enclosed Combustor
Pilot Rating	0.03 MMBtu/hr	Max. pilot fuel usage for Leed Enclosed Combustor
Combustor Rating	11.66 MMBtu/hr	Max. input from Leed Enclosed Combustor Operations Manual

Company Name:
 Facility Name:
 Project Description:

EQT Production, LLC
WEU 51 Wellpad
G70A Modification Application

Produced Fluid Storage Tanks

Storage Tanks (400 bbl, each) - Controlled (Per tank)

Constituent	Total Emissions	
	lb/hr	tpy
Methane	0.280	1.225
Ethane	0.333	1.457
Propane	0.263	1.154
Isobutane	0.050	0.219
n-Butane	0.098	0.429
Isopentane	0.027	0.119
n-Pentane	0.024	0.106
n-Hexane	0.015	0.066
Cyclohexane	<0.001	<0.001
Other Hexanes	<0.001	<0.001
Heptanes	0.013	0.059
Benzene	<0.001	0.001
Toluene	<0.001	0.001
Ethylbenzene	<0.001	<0.001
Xylenes	<0.001	0.001
2,2,4-Trimethylpentane	<0.001	<0.001
C8+ Heavies	0.004	0.022
Total Emissions:	1.143	5.004
Total VOC Emissions:	0.497	2.176
Total HAP Emissions:	0.016	0.069

Enclosed Combustor Emissions - (Per combustor) ¹

Pollutant ²	Emission Factor (lb/MMBtu)	Combustor Potential Emissions		Pilot Potential Emissions	
		(lb/hr)	(tpy)	(lb/hr)	(tpy)
NO _x	0.082	0.958	4.198	0.002	0.009
CO	0.069	0.805	3.526	0.002	0.008
PM/PM ₁₀	0.006	0.073	0.319	1.6E-04	0.001
SO ₂	4.9E-04	0.006	0.025	1.3E-05	5.69E-05
CO ₂ (Natural Gas Firing)	116.997	1364.189	5975.146	3.081	13.495
CH ₄ (Natural Gas Firing)	0.002	0.026	0.113	5.8E-05	2.54E-04
N ₂ O (Natural Gas Firing)	2.2E-04	0.003	0.011	5.8E-06	2.54E-05

¹ 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 this facility. 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.

Company Name: EQT Production, LLC
Facility Name: WEU 51 Wellpad
Project Description: G70A Modification Application

Line Heaters

Parameter	Value	Units
Fuel Used	Natural Gas	
Higher Heating Value (HHV)	1,217	BTU/scf
Heat Input	1.54	MMBtu/hr (each)
Fuel Consumption	1.27E-03	MMscf/hr (each)
Potential Annual Hours of Operation	8,760	hr/yr

Criteria and Manufacturer Specific Pollutant Emission Rates:

Pollutant	Emission Factor (lb/MMscf) ¹	Potential Emissions	
		(lb/hr) ²	(tons/yr) ³
NO _x	100	1.3E-01	5.5E-01
CO	84	1.1E-01	4.7E-01
SO ₂	0.6	7.6E-04	3.3E-03
PM Total	7.6	9.6E-03	4.2E-02
PM Condensable	5.7	7.2E-03	3.2E-02
PM ₁₀ (Filterable)	1.9	2.4E-03	1.1E-02
PM _{2.5} (Filterable)	1.9	2.4E-03	1.1E-02
VOC	5.5	7.0E-03	3.0E-02
Lead	5.0E-04	6.3E-07	2.8E-06
CO ₂ (Natural Gas Firing) ⁴	142,327	180	789
CH ₄ (Natural Gas Firing) ⁴	2.7	3.4E-03	1.5E-02
N ₂ O (Natural Gas Firing) ⁴	0.27	3.4E-04	1.5E-03

Company Name: EQT Production, LLC
Facility Name: WEU 51 Wellpad
Project Description: G70A Modification Application

Line Heaters

Hazardous Air Pollutant (HAP) Potential Emissions:

Pollutant	Emission Factor (lb/MMscf) ¹	Potential Emissions	
		(lb/hr) ²	(tons/yr) ³
<u>HAPs:</u>			
Methylnaphthalene (2-)	2.4E-05	3.0E-08	1.3E-07
3-Methylchloranthrene	1.8E-06	2.3E-09	1.0E-08
7,12-Dimethylbenz(a)anthracene	1.6E-05	2.0E-08	8.9E-08
Acenaphthene	1.8E-06	2.3E-09	1.0E-08
Acenaphthylene	1.8E-06	2.3E-09	1.0E-08
Anthracene	2.4E-06	3.0E-09	1.3E-08
Benz(a)anthracene	1.8E-06	2.3E-09	1.0E-08
Benzene	2.1E-03	2.7E-06	1.2E-05
Benzo(a)pyrene	1.2E-06	1.5E-09	6.7E-09
Benzo(b)fluoranthene	1.8E-06	2.3E-09	1.0E-08
Benzo(g,h,i)perylene	1.2E-06	1.5E-09	6.7E-09
Benzo(k)fluoranthene	1.8E-06	2.3E-09	1.0E-08
Chrysene	1.8E-06	2.3E-09	1.0E-08
Dibenzo(a,h) anthracene	1.2E-06	1.5E-09	6.7E-09
Dichlorobenzene	1.2E-03	1.5E-06	6.7E-06
Fluoranthene	3.0E-06	3.8E-09	1.7E-08
Fluorene	2.8E-06	3.5E-09	1.6E-08
Formaldehyde	7.5E-02	9.5E-05	4.2E-04
Hexane	1.8E+00	2.3E-03	1.0E-02
Indo(1,2,3-cd)pyrene	1.8E-06	2.3E-09	1.0E-08
Naphthalene	6.1E-04	7.7E-07	3.4E-06
Phenanthrene	1.7E-05	2.2E-08	9.4E-08
Pyrene	5.0E-06	6.3E-09	2.8E-08
Toluene	3.4E-03	4.3E-06	1.9E-05
Arsenic	2.0E-04	2.5E-07	1.1E-06
Beryllium	1.2E-05	1.5E-08	6.7E-08
Cadmium	1.1E-03	1.4E-06	6.1E-06
Chromium	1.4E-03	1.8E-06	7.8E-06
Cobalt	8.4E-05	1.1E-07	4.7E-07
Manganese	3.8E-04	4.8E-07	2.1E-06
Mercury	2.6E-04	3.3E-07	1.4E-06
Nickel	2.1E-03	2.7E-06	1.2E-05
Selenium	2.4E-05	3.0E-08	1.3E-07
Total HAP		2.4E-03	1.0E-02

¹ Emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, 1.4-3, & 1.4-4.

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: WEU 51 Wellpad
Project Description: G70A Modification Application

Thermoelectric Generators (TEGs)

Parameter	Value	Units
Manufacturer	Global Thermoelectric	
Fuel Used	Natural Gas	
Higher Heating Value (HHV)	1,217	BTU/scf
Heat Input	0.013	MMBtu/hr (each)
Fuel Consumption ¹	1.07E-05	MMscf/hr (each)
Potential Annual Hours of Operation	8,760	hr/yr

¹ Global Thermoelectric specification sheet states 311 f³/day at 1000 BTU/ft³.

Criteria and Manufacturer Specific Pollutant Emission Rates:

Pollutant	Emission Factor (lb/MMscf) ¹	Potential Emissions	
		(lb/hr) ²	(tons/yr) ³
NO _x	100	1.1E-03	4.7E-03
CO	84	8.9E-04	3.9E-03
SO ₂	0.6	6.4E-06	2.8E-05
PM Total	7.6	8.1E-05	3.5E-04
PM Condensable	5.7	6.1E-05	2.7E-04
PM ₁₀ (Filterable)	1.9	2.0E-05	8.9E-05
PM _{2.5} (Filterable)	1.9	2.0E-05	8.9E-05
VOC	5.5	5.9E-05	2.6E-04
Lead	5.00E-04	5.3E-09	2.3E-08
CO ₂ (Natural Gas Firing) ⁴	142,327	2	7
CH ₄ (Natural Gas Firing) ⁴	2.7	2.9E-05	1.3E-04
N ₂ O (Natural Gas Firing) ⁴	0.27	2.9E-06	1.3E-05

Company Name: EQT Production, LLC
Facility Name: WEU 51 Wellpad
Project Description: G70A Modification Application

Thermoelectric Generators (TEGs)

Hazardous Air Pollutant (HAP) Potential Emissions:

Pollutant	Emission Factor (lb/MMscf) ¹	Potential Emissions	
		(lb/hr) ²	(tons/yr) ³
<u>HAPs:</u>			
Methylnaphthalene (2-)	2.4E-05	2.6E-10	1.1E-09
3-Methylchloranthrene	1.8E-06	1.9E-11	8.4E-11
7,12-Dimethylbenz(a)anthracene	1.6E-05	1.7E-10	7.5E-10
Acenaphthene	1.8E-06	1.9E-11	8.4E-11
Acenaphthylene	1.8E-06	1.9E-11	8.4E-11
Anthracene	2.4E-06	2.6E-11	1.1E-10
Benz(a)anthracene	1.8E-06	1.9E-11	8.4E-11
Benzene	2.1E-03	2.2E-08	9.8E-08
Benzo(a)pyrene	1.2E-06	1.3E-11	5.6E-11
Benzo(b)fluoranthene	1.8E-06	1.9E-11	8.4E-11
Benzo(g,h,i)perylene	1.2E-06	1.3E-11	5.6E-11
Benzo(k)fluoranthene	1.8E-06	1.9E-11	8.4E-11
Chrysene	1.8E-06	1.9E-11	8.4E-11
Dibenzo(a,h) anthracene	1.2E-06	1.3E-11	5.6E-11
Dichlorobenzene	1.2E-03	1.3E-08	5.6E-08
Fluoranthene	3.0E-06	3.2E-11	1.4E-10
Fluorene	2.8E-06	3.0E-11	1.3E-10
Formaldehyde	7.5E-02	8.0E-07	3.5E-06
Hexane	1.8E+00	1.9E-05	8.4E-05
Indo(1,2,3-cd)pyrene	1.8E-06	1.9E-11	8.4E-11
Naphthalene	6.1E-04	6.5E-09	2.8E-08
Phenanthrene	1.7E-05	1.8E-10	7.9E-10
Pyrene	5.0E-06	5.3E-11	2.3E-10
Toluene	3.4E-03	3.6E-08	1.6E-07
Arsenic	2.0E-04	2.1E-09	9.3E-09
Beryllium	1.2E-05	1.3E-10	5.6E-10
Cadmium	1.1E-03	1.2E-08	5.1E-08
Chromium	1.4E-03	1.5E-08	6.5E-08
Cobalt	8.4E-05	8.9E-10	3.9E-09
Manganese	3.8E-04	4.0E-09	1.8E-08
Mercury	2.6E-04	2.8E-09	1.2E-08
Nickel	2.1E-03	2.2E-08	9.8E-08
Selenium	2.4E-05	2.6E-10	1.1E-09
Total HAP		2.0E-05	8.8E-05

¹ Emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, 1.4-3, & 1.4-4.

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: WEU 51 Wellpad
 Project Description: G70A Modification Application

Fugitive Components

Component Counts

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 Emissions from Component Leaks

Equipment Type	Service	Emission Factors ¹ (kg/hr/source)	Facility Equipment Count ² (units)	TOC Total Fugitive Emissions (lb/hr)	TOC Annual Fugitive Emissions (tpy)
Valves	Gas	5.97E-03	342	4.50	19.72
Pump Seals	Light Liquid	1.99E-02	1	0.04	0.19
Pressure Relief Valves	Gas	1.04E-01	39	8.94	39.17
Connectors	All	1.83E-03	1,444	5.83	25.52
Open-Ended Lines	All	1.70E-03	18	0.07	0.30
Emission Totals:				19.38	84.88

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). SOCMF factors were used as it was representative of natural gas liquids extraction.

² Assumes one pump for liquid loading, no compressors, and one meter per wellhead. Pressure relief valves count includes an Enardo valve and Emergency Pressure Relief valve for each storage tank.

VOC and HAP Weight Fractions¹

Service	Weight Fraction VOC	Weight Fraction Hexane	Weight Fraction Benzene	Weight Fraction Toluene	Weight Fraction Ethylbenzene	Weight Fraction 2,2,4-trimethylpentane	Weight Fraction Xylene
Gas	0.139	2.4E-03	7.8E-05	2.3E-04	<0.001	3.0E-03	2.7E-04
Light Liquid	1.000	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
All	0.139	2.4E-03	7.8E-05	2.3E-04	<0.001	3.0E-03	2.7E-04

Company Name: EQT Production, LLC
 Facility Name: WEU 51 Wellpad
 Project Description: G70A Modification Application

Liquid Loading

Liquid Loading Losses:

Uncontrolled Loading Losses: L_L (lb/10³ gal) = 12.46 (SPM)/T

Controlled Loading Losses: L_L (lb/10³ gal) = 12.46 (SPM)/T * (1 - collection efficiency * control efficiency)

Parameter	Value	Description
S	1.45	saturation factor for splash loading (AP-42 Table 5.2-1)
Collection Efficiency	70%	collection efficiency for non-NSPS/MACT annual leak tested trucks
Control Efficiency	95%	control efficiency of combustor
P	0.38	max true vapor pressure of liquid loaded (psia) - EPA TANKS Data
M	25.48	molecular weight of vapors (lb/lb-mol) - EPA TANKS Data
T	511.0	temperature of liquids loaded (deg R) - EPA TANKS Data

Description	Loading Losses (lb/10 ³ gal)	Maximum Throughput ¹ (gal)	VOC Emissions		
			Total Uncontrolled (tpy)	Uncontrolled Uncaptured (tpy)	Controlled ² Captured (tpy)
Liquids Hauling	0.3	30,000,000	5.16	1.55	0.18

¹ Sum of the annual throughput from each well at the pad.

Speciated HAP Emission Potential:

Constituent	mol% ¹	True Vapor Pressure of Organic Compounds in liquid (psia) ²	Partial Vapor Pressure (psia)	Mole Fraction	Molecular Weight	VOC Vapor Weight	Speciated Weight Fraction	Controlled Speciated Liquid Loading Emissions (tpy) ³
Methane	0.095	---	---	---	---	---	---	---
Ethane	0.602	---	---	---	---	---	---	---
Propane	1.646	127.310	2.1E+00	3.2E-01	4.4E+01	1.4E+01	2.0E-01	3.5E-02
Isobutane	0.867	46.110	4.0E-01	6.1E-02	5.8E+01	3.6E+00	4.9E-02	8.9E-03
n-Butane	2.986	32.045	9.6E-01	1.5E-01	5.8E+01	8.5E+00	1.2E-01	2.1E-02
Isopentane	3.103	12.530	3.9E-01	5.9E-02	7.2E+01	4.3E+00	5.9E-02	1.1E-02
n-Pentane	3.943	8.433	3.3E-01	5.1E-02	7.2E+01	3.7E+00	5.1E-02	9.2E-03
n-Hexane	4.692	2.436	1.1E-01	1.7E-02	8.6E+01	1.5E+00	2.1E-02	3.8E-03
Other Hexanes	4.939	2.436	1.2E-01	1.8E-02	8.6E+01	1.6E+00	2.2E-02	4.0E-03
Heptanes	14.686	0.735	1.1E-01	1.7E-02	9.8E+01	1.6E+00	2.2E-02	4.0E-03
Benzene	0.200	1.508	3.0E-03	4.6E-04	7.8E+01	3.6E-02	5.0E-04	9.0E-05
Toluene	1.138	0.425	4.8E-03	7.4E-04	9.2E+01	6.8E-02	9.4E-04	1.7E-04
Ethylbenzene	0.155	0.151	2.3E-04	3.6E-05	1.1E+02	3.8E-03	5.3E-05	9.6E-06
Xylenes	1.763	0.180	3.2E-03	4.8E-04	1.1E+02	5.1E-02	7.1E-04	1.3E-04
2,2,4-Trimethylpentane	0.031	0.596	1.8E-04	2.8E-05	1.1E+02	3.2E-03	4.5E-05	8.1E-06
C8+ Heavies	59.154	3.400	2.0E+00	3.1E-01	1.1E+02	3.3E+01	4.6E-01	8.3E-02
	100.0		6.54			72.15	1.00	
Total Emissions:								0.18
Total HAP Emissions:								0.004

¹ An atmospheric analysis of a representative condensate sample (from wellpad OXF-131, Well #512441) is utilized to estimate the composition.

² Emission factors from AP-42 Section 7.1 "Liquid Storage Tanks" Tables 7.1-2, 7.1-3 and 7.1-5 (at 70 deg F or ~21 deg C) and Handbook of Chemistry and Physics: 84th Edition (at 295 K)

³ Speciated emissions (tpy) = Speciated Weight Fraction x Calculated Controlled Liquid Loading Emissions (tpy). As methane and ethane will flash off prior to loading, the emissions from these constituents are not included in the speciation.

Company Name: EOT Production, LLC
Facility Name: WEU 51 Wellpad
Project Description: G70A Modification Application

Haul Roads

Estimated Potential Road Fugitive Emissions

Unpaved Road Emissions

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

	PM	PM₁₀	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/trip)	Trips Per Year	Mileage Per Year	Control (%)	Emissions (tpy)		
								PM	PM₁₀	PM_{2.5}
Liquids Hauling	20	40	30	0.34	7,500	2,557	0	5.48	1.40	0.140
Employee Vehicles	3	3	3	0.34	200	68	0	0.05	0.01	0.001
Total Potential Emissions								5.53	1.41	0.14

Company Name: EQT Production, LLC
 Facility Name: WEU 51 Wellpad
 Project Description: G70A Modification Application

Combustor Flow Rate Calculations

TANK GAS STREAM (FROM E&P TANK v2.0) ¹					
Component	lb/hr	lb-mol/hr	mol%	MW lb/lb-mol	MW in Mixture
Carbon Dioxide	3.184	0.072	0.016	44.01	0.72
Nitrogen	0.648	0.023	0.005	28.00	0.15
Methane	31.952	1.992	0.451	16.04	7.24
Ethane	38.008	1.264	0.286	30.07	8.61
Propane	30.104	0.683	0.155	44.10	6.82
Isobutane	5.704	0.098	0.022	58.12	1.29
n-Butane	11.192	0.193	0.044	58.12	2.54
Isopentane	3.120	0.043	0.010	72.15	0.71
n-Pentane	0.344	0.005	0.001	72.15	0.08
n-Hexane	1.728	0.020	0.005	85.67	0.39
Cyclohexane	<0.001	<0.001	<0.001	84.16	<0.001
Other Hexanes	<0.001	<0.001	<0.001	86.18	<0.001
Heptanes	1.536	0.016	0.004	97.88	0.35
2,2,4-Trimethylpentane	<0.001	<0.001	<0.001	114.23	<0.001
Benzene	0.024	<0.001	<0.001	78.11	0.01
Toluene	0.024	<0.001	<0.001	92.14	0.01
Ethylbenzene	<0.001	<0.001	<0.001	106.17	<0.001
Xylenes	0.032	<0.001	<0.001	106.17	0.01
C8 + Heavies	0.560	0.005	0.001	107.73	0.127

Total	128.16	4.41		29.03	lb/lbmole
-------	--------	------	--	-------	-----------

1. Representative gas stream from the produced water storage tanks flowing to the combustor

C001

Combustor Rating	11.66 MMBtu/hr	Max. input from Leed Enclosed Combustor Operations Manual
Pilot Rating	0.03 MMBtu/hr	Max. pilot fuel usage for Leed Enclosed Combustor
Pilot Rating	26,335 btu/hr	
Pilot Fuel Usage	22 scf/hr	
Combustor Flow Capacity	188.38 MSCFD	Max. flowrate from LEED Combustor Operations Manual
	7,849 scf/hr	
	131 scf/min	

Enclosed Combustor Mass Flow Rate (C001)

$$\frac{7,849 \text{ scf}}{\text{hr}} * \frac{1 \text{ lbmole}}{379 \text{ scf}} * \frac{29.03 \text{ lb}}{\text{lbmole}} = \frac{601 \text{ lb}}{\text{hr}}$$

Mass flow rate (lb/hr) = Maximum Rated total flow capacity (scf/hr) * Vapor Molecular Weight (lb/lbmole) / Molar Gas Volume (scf/lbmole)

Company Name:
 Facility Name:
 Project Description:

EQT Production, LLC
WEU 51 Wellpad
G70A Modification Application

Gas Analysis

Sample Location: WEU-1 Gas Analysis
 Sample Date: 5/20/2013
 HHV (Btu/scf): 1,217

Constituent	Natural Gas Stream Speciation (Mole %)	Molecular Weight	Molar Weight	Average Weight Fraction	Natural Gas Stream Speciation (Wt. %)
Carbon Dioxide	0.240	44.01	1.1E-01	5.3E-03	5.3E-01
Nitrogen	0.428	28.01	1.2E-01	6.0E-03	6.0E-01
Methane	80.616	16.04	1.3E+01	6.5E-01	6.5E+01
Ethane	13.296	30.07	4.0E+00	2.0E-01	2.0E+01
Propane	3.541	44.10	1.6E+00	7.8E-02	7.8E+00
Isobutane	0.426	58.12	2.5E-01	1.2E-02	1.2E+00
n-Butane	0.746	58.12	4.3E-01	2.2E-02	2.2E+00
Isopentane	0.191	72.15	1.4E-01	6.9E-03	6.9E-01
n-Pentane	0.164	72.15	1.2E-01	5.9E-03	5.9E-01
n-Hexane	0.055	86.18	4.7E-02	2.4E-03	2.4E-01
Cyclohexane	0.009	84.16	7.6E-03	3.8E-04	3.8E-02
Other Hexanes	0.091	86.18	7.8E-02	3.9E-03	3.9E-01
Heptanes	0.029	100.21	2.9E-02	1.4E-03	1.4E-01
2,2,4-Trimethylpentane	0.052	114.23	5.9E-02	3.0E-03	3.0E-01
Benzene*	0.002	78.11	1.6E-03	7.8E-05	7.8E-03
Toluene*	0.005	92.14	4.6E-03	2.3E-04	2.3E-02
Ethylbenzene*	<0.001	106.17	<0.001	<0.001	<0.001
Xylenes*	0.005	106.16	5.3E-03	2.7E-04	2.7E-02
C8 + Heavies	0.043	114.23	4.9E-02	2.5E-03	2.5E-01
Totals	100		19.94	1.00	100

TOC (Total)	99.27	98.87
VOC (Total)	5.36	13.95
HAP (Total)	0.12	0.59

* Project Setup Information

*

Project File : \\tsclient\Z\client\EQT Corporation\West Virginia\WV
Production Wells\153901.0056 WV Wellpads 2015\WEU 51\Draft\20150819 Draft
Application - Throughput Increase_v2.0\Attach 1 - Emission
Calcs\2015-0818_WEU-51_v2.0.ept
Flowsheet Selection : Oil Tank with Separator
Calculation Method : RVP Distillation
Control Efficiency : 93.0%
Known Separator Stream : High Pressure Oil
Entering Air Composition : No

Filed Name : WEU-51
Date : 2015.08.12

* Data Input

*

Separator Pressure : 717.00[psi g]
Separator Temperature : 60.00[F]
Ambient Pressure : 14.70[psi a]
Ambient Temperature : 55.00[F]
C10+ SG : 0.7741
C10+ MW : 152.78

-- High 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	1.0777
21	n-C6	4.3368
22	2,2,4-Tri methyl p	0.0000

-- Sales Oil

Production Rate : 26.8 [bbl/day]
 Days of Annual Operation : 365 [days/year]
 API Gravity : 56.11
 Reid Vapor Pressure : 10.60 [psi a]

 * Calculation Results
 *

-- Emission Summary

Item	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]	Controlled [ton/yr]	Controlled [lb/hr]
Total HAPs	0.990	0.226	0.069	0.016
Total HC	69.391	15.843	4.857	1.109
Page 1	E&P TANK			
VOCs, C2+	51.896	11.848	3.633	0.829
VOCs, C3+	31.087	7.097	2.176	0.497

Uncontrolled Recovery Info.

Vapor	5.0600	[MSCFD]
HC Vapor	4.9500	[MSCFD]
GOR	188.81	[SCF/bbl]

-- Emission Composition

No	Component	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]	Controlled [ton/yr]	Controlled [lb/hr]
1	H2S	0.000	0.000	0.000	0.000
2	O2	0.000	0.000	0.000	0.000
3	CO2	1.744	0.398	1.744	0.398
4	N2	0.356	0.081	0.356	0.081
5	C1	17.495	3.994	1.225	0.280
6	C2	20.809	4.751	1.457	0.333
7	C3	16.483	3.763	1.154	0.263
8	i-C4	3.125	0.713	0.219	0.050
9	n-C4	6.127	1.399	0.429	0.098
10	i-C5	1.707	0.390	0.119	0.027
11	n-C5	1.508	0.344	0.106	0.024
12	C6	0.000	0.000	0.000	0.000
13	C7	0.839	0.192	0.059	0.013
14	C8	0.152	0.035	0.011	0.002
15	C9	0.060	0.014	0.004	0.001
16	C10+	0.093	0.021	0.007	0.001
17	Benzene	0.013	0.003	0.001	0.000
18	Toluene	0.015	0.003	0.001	0.000
19	E-Benzene	0.000	0.000	0.000	0.000
20	Xylenes	0.017	0.004	0.001	0.000
21	n-C6	0.948	0.216	0.066	0.015
22	2,2,4-Tri methyl p	0.000	0.000	0.000	0.000
	Total	71.491	16.322	5.004	1.143

-- Stream Data

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

2015-0818_WEU-51_v2.0.txt

mol %							
1 H2S	34.80	0.0000	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
0.0000							
3 CO2	44.01	0.3400	0.0318	0.0315	1.6278	1.6278	
1.6278							
4 N2	28.01	0.1015	0.0008	0.0007	0.5220	0.5225	
0.5220							
5 C1	16.04	8.8507	0.2508	0.2421	44.7849	44.7886	
44.7849							
6 C2	30.07	6.3150	1.0249	1.0195	28.4195	28.4162	
28.4195							
7 C3	44.10	4.6738	2.1187	2.1161	15.3502	15.3486	
15.3502							
8 i-C4	58.12	1.1114	0.8490	0.8487	2.2081	2.2078	
2.2081							
9 n-C4	58.12	2.8317	2.4733	2.4730	4.3290	4.3288	
4.3290							
10 i-C5	72.15	1.4757	1.5963	1.5964	0.9717	0.9716	
0.9717							
11 n-C5	72.15	1.7664	1.9837	1.9839	0.8583	0.8583	
0.8583							
12 C6	86.16	0.0000	0.0000	0.0000	0.0000	0.0000	
0.0000							
13 C7	100.20	8.4992	10.4483	10.4502	0.3551	0.3550	
0.3551							
14 C8	114.23	4.7297	5.8482	5.8493	0.0564	0.0564	
0.0564							
15 C9	128.28	5.3642	6.6431	6.6444	0.0200	0.0214	
0.0200							
16 C10+	152.78	48.1421	59.6577	59.6693	0.0251	0.0251	
0.0251							
17 Benzene	78.11	0.0764	0.0930	0.0931	0.0071	0.0071	
0.0071							
18 Toluene	92.13	0.2824	0.3484	0.3484	0.0066	0.0066	
0.0066							
19 E-Benzene	106.17	0.0012	0.0015	0.0015	0.0000	0.0000	
0.0000							
20 Xylenes	106.17	1.0825	1.3400	1.3403	0.0064	0.0065	
0.0064							
21 n-C6	86.18	4.3562	5.2906	5.2915	0.4518	0.4518	
0.4518							
22 2,2,4-Trimethyl p	114.24	0.0000	0.0000	0.0000	0.0000	0.0000	
0.0000							
MW		109.16	128.26	128.28	29.36	29.36	
29.36							
Stream Mole Ratio		1.0000	0.8069	0.8067	0.1931	0.0002	
0.1933							
Heating Value	[BTU/SCF]				1676.97	1676.98	
1676.97							
Gas Gravity	[Gas/Air]				1.01	1.01	
1.01							
Bubble Pt. @ 100F	[psi a]	378.40	23.63	23.29			
RVP @ 100F	[psi a]	82.30	11.05	11.02			
Spec. Gravity @ 100F		0.707	0.729	0.729			

2015-0818_WEU-51_v2.0.txt

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification

User Identification: WEU-51 Liquid Loading
City:
State:
Company:
Type of Tank: Vertical Fixed Roof Tank
Description: Liquid Loading parameters for WEU-51 wellpad using OXF-131 atmospheric condensate analysis.

Tank Dimensions

Shell Height (ft):	20.00
Diameter (ft):	12.00
Liquid Height (ft) :	20.00
Avg. Liquid Height (ft):	10.00
Volume (gallons):	16,800.00
Turnovers:	1,785.71
Net Throughput(gal/yr):	30,000,000.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	Gray/Light
Shell Condition:	Good
Roof Color/Shade:	Gray/Light
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	0.00
Slope (ft/ft) (Cone Roof)	0.00

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.70

Meteorological Data used in Emissions Calculations: Elkins, West Virginia (Avg Atmospheric Pressure = 13.73 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

WEU-51 Liquid Loading - Vertical Fixed Roof Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Produced Fluid	All	55.41	46.54	64.27	51.30	0.2992	0.2333	0.3822	25.4776			18.16	
Benzene						1.0267	0.7943	1.3132	78.1100	0.0000	0.0000	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Butane (-n)						0.4614	0.3889	0.5438	58.1200	0.0004	0.0004	58.12	Option 2: A=5.09536, B=935.86, C=238.73
Decane (-n)						0.0301	0.0245	0.0369	142.2900	0.0048	0.0003	142.29	Option 1: VP50 = .026411 VP60 = .033211
Ethylbenzene						0.0923	0.0669	0.1257	106.1700	0.0000	0.0000	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Heptane (-n)						0.5323	0.4043	0.6943	100.2000	0.0008	0.0011	100.20	Option 3: A=37358, B=8.2585
Hexane (-n)						1.6957	1.3330	2.1360	86.1700	0.0004	0.0017	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Isopentane						9.0329	7.1932	11.0836	72.1500	0.0001	0.0032	72.15	Option 1: VP50 = 7.889 VP60 = 10.005
methane						100.7917	87.8791	115.0985	44.0956	0.0009	0.2113	44.10	Option 2: A=7.3408624923, B=1104.2267744, C=291.70993941
Nonane (-n)						0.0588	0.0475	0.0729	128.2600	0.0005	0.0001	128.26	Option 1: VP50 = .051285 VP60 = .065278
Octane (-n)						0.1303	0.1035	0.1637	114.2300	0.0005	0.0001	114.23	Option 1: VP50 = .112388 VP60 = .145444
Pentane (-n)						6.1673	5.0301	7.5097	72.1500	0.0002	0.0026	72.15	Option 3: A=27691, B=7.558
Propane (-n)						100.7917	87.8791	115.0985	44.0956	0.0011	0.2713	44.10	Option 2: A=7.340862493, B=1104.2267744, C=291.70993941
Toluene						0.2857	0.2141	0.3766	92.1300	0.0000	0.0000	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Water						0.2153	0.1602	0.2863	18.0150	0.9900	0.5077	18.02	Option 1: VP50 = .178 VP60 = .247
Xylene (-o)						0.0601	0.0431	0.0827	106.1700	0.0001	0.0000	106.17	Option 2: A=6.998, B=1474.679, C=213.69

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

WEU-51 Liquid Loading - Vertical Fixed Roof Tank

Annual Emission Calculations	
Standing Losses (lb):	12.5727
Vapor Space Volume (cu ft):	1,130.9734
Vapor Density (lb/cu ft):	0.0014
Vapor Space Expansion Factor:	0.0256
Vented Vapor Saturation Factor:	0.8631
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	1,130.9734
Tank Diameter (ft):	12.0000
Vapor Space Outage (ft):	10.0000
Tank Shell Height (ft):	20.0000
Average Liquid Height (ft):	10.0000
Roof Outage (ft):	0.0000
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.0000
Roof Height (ft):	0.0000
Roof Slope (ft/ft):	0.0000
Shell Radius (ft):	6.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0014
Vapor Molecular Weight (lb/lb-mole):	25.4776
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.2992
Daily Avg. Liquid Surface Temp. (deg. R):	515.0759
Daily Average Ambient Temp. (deg. F):	49.0583
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	510.9683
Tank Paint Solar Absorptance (Shell):	0.5400
Tank Paint Solar Absorptance (Roof):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,193.8870
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0256
Daily Vapor Temperature Range (deg. R):	35.4636
Daily Vapor Pressure Range (psia):	0.1488
Breather Vent Press. Setting Range (psia):	0.7300
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.2992
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.2333
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.3822
Daily Avg. Liquid Surface Temp. (deg R):	515.0759
Daily Min. Liquid Surface Temp. (deg R):	506.2100
Daily Max. Liquid Surface Temp. (deg R):	523.9417
Daily Ambient Temp. Range (deg. R):	24.1833
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.8631
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.2992
Vapor Space Outage (ft):	10.0000
Working Losses (lb):	
Working Losses (lb):	999.0754
Vapor Molecular Weight (lb/lb-mole):	25.4776
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.2992
Annual Net Throughput (gal/yr.):	30,000,000.0000
Annual Turnovers:	1,785.7143
Turnover Factor:	0.1835
Maximum Liquid Volume (gal):	16,800.0000
Maximum Liquid Height (ft):	20.0000
Tank Diameter (ft):	12.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	1,011.6481

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

WEU-51 Liquid Loading - Vertical Fixed Roof Tank

Components	Losses(lbs)		
	Working Loss	Breathing Loss	Total Emissions
Produced Fluid	999.08	12.57	1,011.65
Propane (-n)	271.04	3.41	274.45
Butane (-n)	0.43	0.01	0.43
Isopentane	3.22	0.04	3.26
Pentane (-n)	2.64	0.03	2.68
Hexane (-n)	1.74	0.02	1.76
Benzene	0.02	0.00	0.02
Heptane (-n)	1.08	0.01	1.09
Toluene	0.02	0.00	0.02
Octane (-n)	0.15	0.00	0.15
Ethylbenzene	0.00	0.00	0.00
Xylene (-o)	0.02	0.00	0.02
Nonane (-n)	0.07	0.00	0.08
Decane (-n)	0.34	0.00	0.35
Water	507.23	6.38	513.62
methane	211.07	2.66	213.73

ATTACHMENT J

Class I Legal Advertisement

AIR QUALITY PERMIT NOTICE Notice of Application

Notice is given that EQT Production has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Class II General Permit (G70-A) for an existing natural gas production wellpad (WEU-51). The facility is located along Maxwell Ridge Road in Doddridge County approximately 2.9 miles Southeast of West Union, WV at 39.25592°, -80.76326°.

The applicant estimates that the potential increase or decrease to discharge the following Regulated Air Pollutants will be:

Pollutant	Emissions (tons per year)
NO _x	-0.212
CO	-1.78
VOC	18.51
SO ₂	-0.02
PM	-4.42
Total HAPs	0.39
Carbon Dioxide Equivalents (CO ₂ e)	-1,390

Specifically, this application seeks to increase the liquid throughput currently permitted at the Wellpad. 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 XX day of August, 2015.

By: EQT Production
Kenneth Kirk, Executive Vice President
625 Liberty Ave Suite 1700
Pittsburgh, PA 15222

ATTACHMENT K

Electronic Submittal

ATTACHMENT L

General Permit Registration Application Fee

ATTACHMENT M

Siting Criteria Waiver (*not applicable*)

ATTACHMENT N

Material Safety Data Sheet (*not applicable*)

ATTACHMENT O

Emission Summary Sheet

G70-A EMISSIONS SUMMARY SHEET

Emission Point ID No.	Emission Point Type ¹	Emission Unit Vented Through This Point		Air Pollution Control Device		All Regulated Pollutants - Chemical Name/CAS ² (Speciate VOCs & HAPS)	Maximum Potential Uncontrolled Emissions ³		Maximum Potential Controlled Emissions ⁴		Emission Form or Phase (At exit conditions, Solid, Liquid or Gas/Vapor)	Est. Method Used ⁵
		ID No.	Source	ID No.	Device Type		lb/hr	ton/yr	lb/hr	ton/yr		
E017 – E018 (Total-All Tanks)	Upward vertical stack	S008 – S015	Produced Fluid Storage Tanks	None	---	VOC HAPs	56.78 1.81	248.70 7.92	3.98 0.13	17.41 0.55	Gas/Vapor	E&P Tank v2.0
E001 – E007 (Total – All units)	Upward vertical stack	S001– S007	Line Heaters	None	---	NO _x CO PM/PM ₁₀ /PM _{2.5} SO ₂ VOC CO _{2e} HAPs	0.89 0.74 0.07 <0.01 0.05 1,263 0.02	3.88 3.26 0.29 0.02 0.21 5,530 0.07	0.89 0.74 0.07 <0.01 0.05 1,263 0.02	3.88 3.26 0.29 0.02 0.21 5,530 0.07	Gas/Vapor	AP-42
E019– E020 (Total – All units)	Upward vertical stack	S019 – S020	Thermoelectric Generators	None	---	NO _x CO PM/PM ₁₀ /PM _{2.5} SO ₂ VOC CO _{2e} HAPs	<0.01 <0.01 <0.01 <0.01 <0.01 3 <0.01	0.01 <0.01 <0.01 <0.01 <0.01 13 <0.01	<0.01 <0.01 <0.01 <0.01 <0.01 3 <0.01	0.01 <0.01 <0.01 <0.01 <0.01 13 <0.01	Gas/Vapor	AP-42
E016 (Uncaptured – Uncontrolled)	Upward vertical stack	Fugitive	Condensate Liquid Loading	None	---	VOC HAPs	1.18 0.03	5.16 0.12	0.35 0.01	1.55 0.04	Gas/Vapor	AP-42
E017 – E018 (Controlled)	Upward vertical stack	S008-S015	Condensate Liquid Loading	E017-E018	Combustor	VOC HAPs	1.18 0.03	5.16 0.12	0.04 <0.01	0.18 <0.01	Gas/Vapor	AP-42
E017-E018 (Total –All units)	Upward vertical stack	C001- C002	Combustor	NA	---	NO _x CO PM/PM ₁₀ /PM _{2.5} SO ₂ CO _{2e}	1.92 1.61 0.15 0.01 2,793	8.42 7.07 0.64 0.05 12,235	1.92 1.61 0.15 0.01 2,793	8.42 7.07 0.64 0.05 12,235	Gas/Vapor	AP-42

The EMISSION SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSIONS SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

¹ Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

² List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS₂, VOCs, H₂S, Inorganics, Lead, Organics, O₃, NO, NO₂, SO₂, SO₃, all applicable Greenhouse Gases (including CO₂ and methane), etc. **DO NOT LIST** H₂, H₂O, N₂, O₂, and Noble Gases

³ Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

⁴ Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

⁵ Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; M = modeling; O = other (specify).