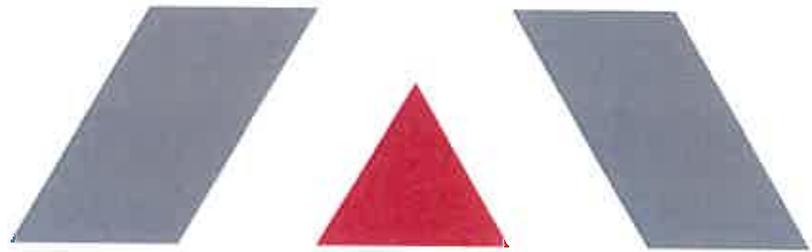


Roy  
670-A133  
017-00044



## PROJECT REPORT

**EQT Production  
OXF-45 Pad**

### G70-A Permit Application



**Where energy meets innovation.**

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

December 2014



*Environmental solutions delivered uncommonly well*

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# 1. INTRODUCTION

EQT Production Company (EQT) is submitting this Class II General Permit (G70-A) application to the West Virginia Department of Environmental Protection (WVDEP) for the OXF-45 facility, a natural gas production well pad, located in Doddridge County, West Virginia.

## 1.1. FACILITY AND PROJECT DESCRIPTION

The OXF-45 Pad is an existing natural gas production facility consisting of one (1) natural gas well. OXF-45 is currently permitted and operating under West Virginia permit R13-3022. Natural gas and liquids (including water and condensate) are extracted from deposits underneath the surface. Natural gas is transported from the well to a gas line for additional processing and compression, as necessary. The liquids produced are stored in storage vessels.

This application seeks to increase the current permit liquid throughput limits of the produced fluids tanks and liquid loading at the facility. A process flow diagram is included as Attachment D.

**The following equipment is already permitted and installed at the OXF-45 Pad:**

- > Three (3) 210 barrel (bbl) storage tanks for condensate/water (produced fluids); and
- > One (1) thermoelectric generator (TEG), rated at 0.013 MMBtu/hr (heat input).

## 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 OXF-45 Pad for air permitting purposes if, and only if, all three elements of the "stationary source" definition above are fulfilled.

There are no Marcellus facilities within a quarter-mile radius of the OXF-45 Pad. The closest wellpad to OXF-45 is the OXF-44 wellpad, which is located approximately 0.4 miles away. Therefore, the OXF-45 Pad should 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 (*not applicable*);
- > Attachment I: Emission Calculations;
- > Attachment J: Class I Legal Advertisement;
- > Attachment K: Electronic Submittal (*not applicable*);
- > Attachment L: General Permit Registration Application Fee;
- > 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 storage of organic liquids in storage tanks and loading of organic liquids into tank trucks. The methods by which emissions from each of these source types, as well as the existing source types, are calculated are summarized below.

- > **Thermoelectric Generator:** Emissions of criteria pollutants and HAPs from the TEG are calculated using U.S. EPA's AP-42 factors for natural gas external combustion.<sup>1</sup> These calculations assume a site-specific heat content of natural gas. Greenhouse gas emissions are calculated according to 40 CFR 98 Subpart C.<sup>2</sup>
- > **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.<sup>3</sup>
- > **Storage Tanks:** Working, breathing and flashing emissions of VOC and HAPs from the condensate/water 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.<sup>4</sup>
- > **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.<sup>5</sup>

---

<sup>1</sup> U.S. EPA, AP 42, Fifth Edition, Volume I, Chapter 1.4, Natural Gas Combustion, Supplement D, July 1998.

<sup>2</sup> 40 CFR 98 Subpart C, *General Stationary Fuel combustion Sources*, Tables C-1 and C-2.

<sup>3</sup> 40 CFR 98 Subpart W, *Petroleum and Natural Gas Systems*, Section 98.233(r), *Population Count and Emission Factors*.

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

<sup>5</sup> U.S. EPA, AP 42, Fifth Edition, Volume I, Section 13.2.2, *Unpaved Roads*, November 2006.

## 3. REGULATORY DISCUSSION

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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, 100,000 tpy of greenhouse gas pollutants (on a carbon dioxide equivalent [CO<sub>2e</sub>] basis), and 100 tpy of all other regulated pollutants.<sup>6</sup> 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.

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<sup>6</sup> 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.

### 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 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 m<sup>3</sup> (~19,813 gallons). All of the tanks at the wellpad have a capacity of 19,813 gallons or less. As such, Subparts K, Ka, and Kb do not apply to the storage tanks at the wellpad.

#### 3.3.3. NSPS Subpart 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 amended in the Federal Register on September 23, 2013<sup>7</sup>. 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 three (3) existing produced fluids storage vessels at the wellpad. As part of this application, EQT is proposing to increase the liquid throughputs for the existing storage vessels. 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

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<sup>7</sup> 78 FR 54816 (<http://www.gpo.gov/fdsys/pkg/FR-2013-09-23/pdf/2013-22010.pdf>)

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 before August 23, 2011 and are therefore are not subject to NSPS 0000.

### **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 JJJJJ - Industrial, Commercial, and Institutional Boilers

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

### **3.4.1. 40 CFR 63 Subpart HH - Oil and Natural Gas Production Facilities**

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

### **3.4.2. 40 CFR 63 Subpart JJJJJ - 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 wellpad does not include any boilers, or gas fired heaters; 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 TEG is a fuel burning unit 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 unit 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 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.

### **3.5.4. 45 CSR 17: To Prevent and Control Particulate Matter Air Pollution from Materials Handling, Preparation, Storage and Other Sources of Fugitive Particulate Matter**

According to 45 CSR 17-3.1:

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

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

### **3.5.5. 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.

### **3.5.6. 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 57<sup>th</sup> 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"/> <b>G10-D</b> – Coal Preparation and Handling                                   | <input type="checkbox"/> <b>G40-C</b> – Nonmetallic Minerals Processing                             |
| <input type="checkbox"/> <b>G20-B</b> – Hot Mix Asphalt   | <input type="checkbox"/> <b>G50-B</b> – Concrete Batch  |
| <input type="checkbox"/> <b>G30-D</b> – Natural Gas Compressor Stations                                 | <input type="checkbox"/> <b>G60-C</b> - Class II Emergency Generator                                |
| <input type="checkbox"/> <b>G33-A</b> – Spark Ignition Internal Combustion Engines                      | <input type="checkbox"/> <b>G65-C</b> – Class I Emergency Generator                                 |
| <input type="checkbox"/> <b>G35-A</b> – Natural Gas Compressor Stations (Flare/Glycol Dehydration Unit) | <input checked="" type="checkbox"/> <b>G70-A</b> – 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:	
5. If applicant is a subsidiary corporation, please provide the name of parent corporation:			
6. <b>WV BUSINESS REGISTRATION.</b> 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):  017-00044	10. List all current 45CSR13 and other General Permit numbers associated with this process (for existing facilities only):  R13-3022		

**A: PRIMARY OPERATING SITE INFORMATION**

11A. Facility name of primary operating site:  OXF-45 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? <span style="float:right"><input checked="" type="checkbox"/> YES <input type="checkbox"/> NO</span> - 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 <b>Modifications or Administrative Updates</b> at an existing facility, please provide directions to the present location of the facility from the nearest state road; - For <b>Construction or Relocation</b> permits, please provide directions to the proposed new site location from the nearest state road. Include a <b>MAP as Attachment F</b> .  Take Interstate 79 to the Clarksburg Exit 119. Turn onto State Route 50 West and go 31.5 miles to Sunnyside Road. Turn left onto Sunnyside Road and go 1.7 miles to Oxford Road (Rt. 21). Turn left and go 5.3 miles and turn left on Straight Fork Rd. Go 1.5 miles to the lease road on the left. Go 3/10 mile to the first lease road on the left. The wellpad is approximately 1500 ft. up the hill.		
15A. Nearest city or town:  New Milton	16A. County:  Doddridge	17A. UTM Coordinates:  Northing (KM): 4,332.241 Easting (KM): 515.944 Zone: 17
18A. Briefly describe the proposed new operation or change (s) to the facility: Increase produced water/condensate throughput at the existing OXF-45 pad.		19A. Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits):  Latitude: <u>39.13921°</u> Longitude: <u>-80.81551°</u>

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

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

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: 2<sup>ND</sup> ALTERNATE OPERATING SITE INFORMATION (only available for G20, G40, & G50 General Permits):**

11C. Name of 2 <sup>nd</sup> alternate operating site:  _N/A_	12C. Address of 2 <sup>nd</sup> 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: _____
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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:  ___/___/___ ASAP  <input type="checkbox"/> If this is an <b>After-The-Fact</b> permit application, provide the date upon which the proposed change did happen: :  ___/___/___	21. Date of anticipated Start-up if registration is granted:  ___/___/___ ASAP
--	--

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 (*Not Applicable*)
- ATTACHMENT I: EMISSIONS CALCULATIONS
- ATTACHMENT J: CLASS I LEGAL ADVERTISEMENT
- ATTACHMENT K: ELECTRONIC SUBMITTAL (*Not Applicable*)
- 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)

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

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) Responsible Official Date

Name & Title Kenneth Kirk, Executive Vice President  
(please print or type)

Signature  \_\_\_\_\_  
(please use blue ink) Authorized Representative (if applicable) Date 12/22/2014

Applicant's Name Alex Bosiljevac – Environmental Coordinator

Phone & Fax 412-395-3699 412-395-7027  
Phone Fax

Email abosiljevac@egt.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**

This project involves the increase in produced water/condensate throughput at an existing natural gas production wellpad operation (OXF-45).

The OXF-45 wellpad consists of one well. The incoming gas stream from the underground wells will pass 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. Once the tanks are filled, the contents are loaded into trucks for transport. At the wellpad, electricity is provided by a thermoelectric generator.

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 <sup>1</sup>	Maximum Potential Uncontrolled Emissions <sup>2</sup>		Maximum Potential Controlled Emissions <sup>3</sup>		Est. Method Used <sup>4</sup>
		lb/hr	ton/yr	lb/hr	ton/yr	
Haul Road/Road Dust Emissions Paved Haul Roads	N/A	---	---	---	---	---
Unpaved Haul Roads	PM	0.14	0.62	0.14	0.62	O <sup>A</sup>
	PM <sub>10</sub>	0.04	0.16	0.04	0.16	
	PM <sub>2.5</sub>	<0.01	0.02	<0.01	0.02	
Loading/Unloading Operations	VOC	0.04	0.16	0.04	0.16	O <sup>B</sup>
	HAP	<0.01	<0.01	<0.01	<0.01	
Equipment Leaks	VOC	Does not apply	2.44	Does not apply	2.44	O <sup>C</sup>
	CO <sub>2e</sub>	Does not apply	116	Does not apply	116	
	HAP	Does not apply	0.13	Does not apply	0.13	
Blowdown Emissions	N/A	---	---	---	---	---
Other	N/A	---	---	---	---	---

<sup>A</sup> AP-42, Section 13.2.2.

<sup>B</sup> AP-42 Section 5.2.

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

<sup>1</sup> List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS<sub>2</sub>, VOCs, H<sub>2</sub>S, Inorganics, Lead, Organics, O<sub>3</sub>, NO, NO<sub>2</sub>, SO<sub>2</sub>, SO<sub>3</sub>, all applicable Greenhouse Gases (including CO<sub>2</sub> and methane), etc. DO NOT LIST H<sub>2</sub>, H<sub>2</sub>O, N<sub>2</sub>, O<sub>2</sub>, and Noble Gases.

<sup>2</sup> 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).

<sup>3</sup> 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).

<sup>4</sup> 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).

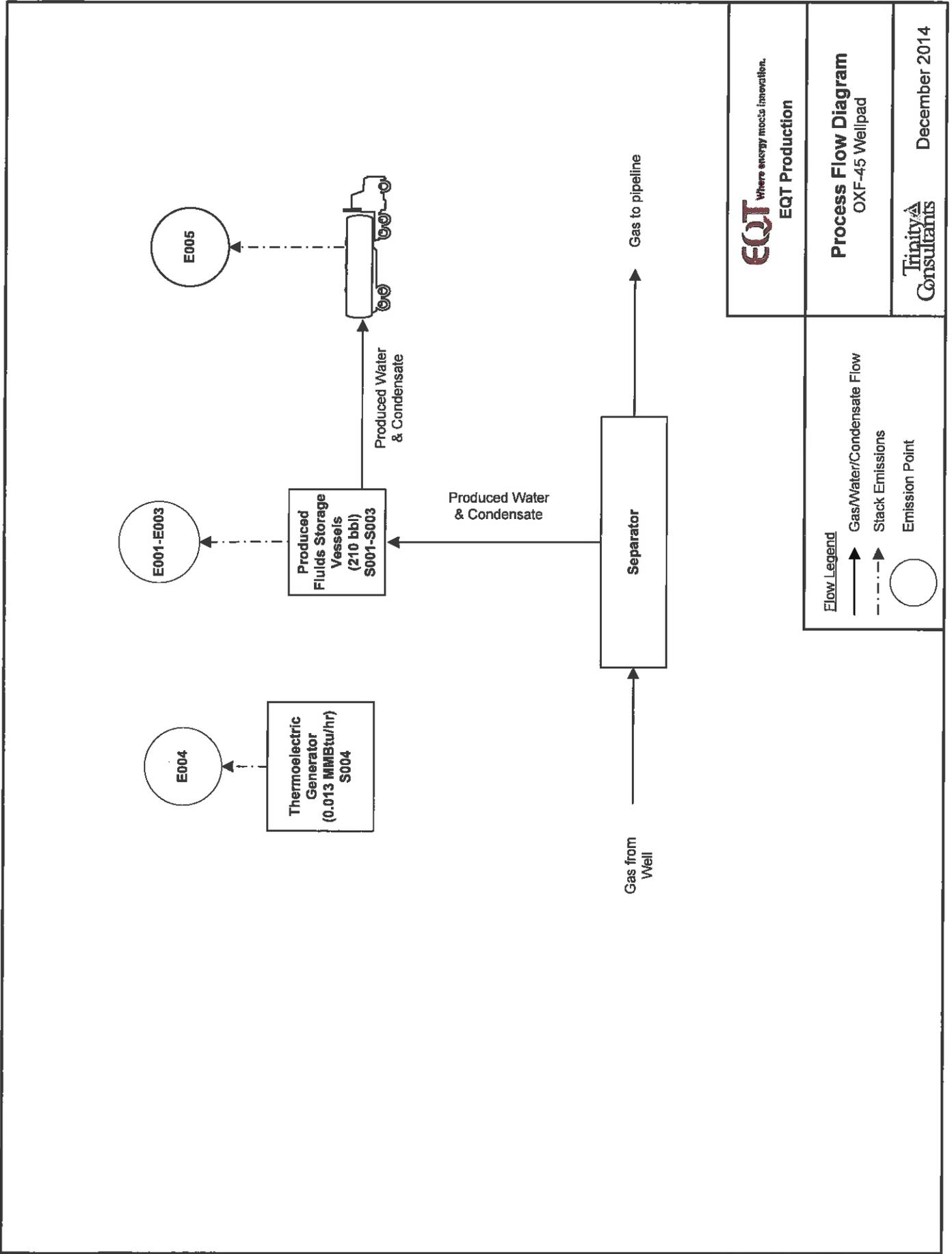
**LEAK SOURCE DATA SHEET**

Source Category	Pollutant	Number of Source Components	Number of Components Monitored by Frequency	Average Time to Repair (days)	Estimated Annual Emission Rate (lb/yr) <sup>1</sup>
Pumps	light liquid VOC	1	TBD	TBD	384
	heavy liquid VOC	---	TBD	TBD	---
	Non-VOC	---	TBD	TBD	---
Valves	Gas VOC	59	TBD	TBD	1,360
	Light Liquid VOC	---	TBD	TBD	---
	Heavy Liquid VOC	---	TBD	TBD	---
	Non-VOC	---	TBD	TBD	---
	Gas VOC	6	TBD	TBD	2,410
Safety Relief Valves	Non VOC	---	TBD	TBD	---
	VOC	1	TBD	TBD	7
Open-ended Lines	Non-VOC	---	TBD	TBD	---
	VOC	---	TBD	TBD	---
Sampling Connections	Non-VOC	---	TBD	TBD	---
	VOC	---	TBD	TBD	---
Compressors	Non-VOC	---	TBD	TBD	---
	VOC	---	TBD	TBD	---
Flanges	Non-VOC	101	TBD	TBD	714
	VOC	---	TBD	TBD	---
	Non-VOC	---	TBD	TBD	---
Other	VOC	---	TBD	TBD	---
	Non-VOC	---	TBD	TBD	---

<sup>1</sup> U.S. EPA. Office of Air Quality Planning and Standards. Protocol for Equipment Leak Emission Estimates. Table 2-1. (Research Triangle Park, NC: U.S. EPA EPA-453/R-95-017, 1995). SOCMI factors were used as it was representative of natural gas liquids extraction

## ATTACHMENT D

### Process Flow Diagram



**EQT** *Where energy meets innovation.*  
**EQT Production**

**Process Flow Diagram**  
 OXF-45 Wellpad

Trinity  
 Consultants

December 2014

**Flow Legend**

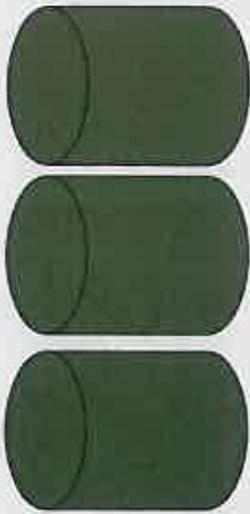
- ↑ Gas/Water/Condensate Flow
- Stack Emissions
- Emission Point

**ATTACHMENT E**

**Plot Plan**

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

Entrance to OXF-45 pad



**Tanks  
210 bbl each  
(3)**



**Wellhead  
(1)**



**Thermoelectric  
Generator (24V)  
(1)**

**ATTACHMENT F**

**Area Map**

## ATTACHMENT F: AREA MAP



**Figure 1 - Map of OXF-45 Location**

UTM Northing (KM): 515.944  
UTM Easting (KM): 4332.241  
Elevation: 1,065 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 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 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.*

<b>Emission Units Table</b> (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 <sup>1</sup>	Emission Point ID <sup>2</sup>	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type <sup>3</sup> and Date of Change	Control Device <sup>4</sup>
S001	E001	Produced Fluids Storage Tank	2008/2014	210 bbl	Modification: Increase throughput	None
S002	E002	Produced Fluids Storage Tank	2008/2014	210 bbl	Modification: Increase throughput	None
S003	E003	Produced Fluids Storage Tank	2008/2014	210 bbl	Modification: Increase throughput	None
S004	E004	Thermoelectric Generator	2008	0.013 MMbtu/hr	Existing, No change	None
S005	E005	Liquid Loading	2008/2014	NA	Modification: Increase throughput	None

<sup>1</sup> For Emission Units (or Sources) use the following numbering system: 1S, 2S, 3S,... or other appropriate designation.  
<sup>2</sup> For Emission Points use the following numbering system: 1E, 2E, 3E, ... or other appropriate designation.  
<sup>3</sup> New, modification, removal  
<sup>4</sup> 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:	
047-017-05644	

*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 OXF-45 Wellpad	2. Tank Name Produced Fluids Tanks
3. Emission Unit ID number S001 through S003	4. Emission Point ID number E001 through E003
5. Date Installed or Modified ( <i>for existing tanks</i> ) Installed 2008; Modified 2014	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 in produced fluids throughput	
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. 210 bbl	
9A. Tank Internal Diameter (ft.) 10	9B. Tank Internal Height (ft.) 14
10A. Maximum Liquid Height (ft.) 15	10B. Average Liquid Height (ft.) 7
11A. Maximum Vapor Space Height (ft.)	11B. Average Vapor Space Height (ft.)
12. Nominal Capacity ( <i>specify barrels or gallons</i> ). This is also known as "working volume. 210 bbl	
13A. Maximum annual throughput (gal/yr) ~548,688 per tank	13B. Maximum daily throughput (gal/day) ~1,503 per tank
14. Number of tank turnovers per year ~63 per tank	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 <input type="checkbox"/> horizontal <input checked="" type="checkbox"/> flat roof <input type="checkbox"/> cone roof <input type="checkbox"/> dome roof <input type="checkbox"/> other (describe)  <input type="checkbox"/> External Floating Roof <input type="checkbox"/> pontoon roof <input type="checkbox"/> double deck roof <input type="checkbox"/> Domed External (or Covered) Floating Roof <input type="checkbox"/> Internal Floating Roof <input type="checkbox"/> vertical column support <input type="checkbox"/> self-supporting <input type="checkbox"/> Variable Vapor Space <input type="checkbox"/> lifter roof <input type="checkbox"/> diaphragm <input type="checkbox"/> Pressurized <input type="checkbox"/> spherical <input type="checkbox"/> 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 checked="" type="checkbox"/> Refer to enclosed TANKS Summary Sheets
--



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

25C. Is the Floating Roof equipped with a secondary seal? <input type="checkbox"/> Yes <input type="checkbox"/> No			
25D. If yes, how is the secondary seal mounted? (check one) <input type="checkbox"/> Shoe <input type="checkbox"/> Rim <input type="checkbox"/> Other (describe):			
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 <b>Internal Floating Roof Tanks</b> <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 <sup>2</sup> ):	26F. For column supported tanks, # of columns:	26G. For column supported tanks, diameter of column:
<b>SITE INFORMATION:</b>			
27. Provide the city and state on which the data in this section are based: Elkins, West Virginia			
28. Daily Avg. Ambient Temperature (°F): 49.06		29. Annual Avg. Maximum Temperature (°F): 61.15	
30. Annual Avg. Minimum Temperature (°F): 36.97		31. Avg. Wind Speed (mph): 6.17	
32. Annual Avg. Solar Insulation Factor (BTU/ft <sup>2</sup> -day): 1,193.89		33. Atmospheric Pressure (psia): 13.73	
<b>LIQUID INFORMATION:</b>			
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): 0.2217	35A. Minimum (psig): 0.1657	35B. Maximum (psig): 0.2937	
36A. Minimum liquid surface temperature (°F): 46.54	36B. Corresponding vapor pressure (psia): 0.1657		
37A. Avg. liquid surface temperature (°F): 55.41	37B. Corresponding vapor pressure (psia): 0.2217		
38A. Maximum liquid surface temperature (°F): 64.27	38B. Corresponding vapor pressure (psia): 0.2937		
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 Water/Condensate		
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):	19.13		
39F. Maximum true vapor pressure (psia):	TBD		
39G. Maxim Reid vapor pressure (psia):	TBD		
39H. Months Storage per year. From:	12 (All year)		
To:			



## 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: S005	2. Emission Point ID: E005	3. Year Installed/ Modified: Installed 2008; Proposed modification -2014 (Increase in produced fluids throughput)		
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 Water and Condensate		
Max. daily throughput (1000 gal/day)	Variable		
Max. annual throughput (gal/yr)	1,646,064		
Loading Method <sup>1</sup>	SP		
Max. Fill Rate (gal/min)			
Average Fill Time (min/loading)			
Max. Bulk Liquid Temperature (°F)	51.30		
True Vapor Pressure <sup>2</sup>	0.2937		
Cargo Vessel Condition <sup>3</sup>	Unknown		
Control Equipment or Method <sup>4</sup>	N/A		
Minimum collection efficiency (%)	0		
Minimum control efficiency (%)	N/A		
<i>* Continued on next page</i>			

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

Maximum Emission Rate	Loading (lb/hr)	VOC: 0.04 HAP: <0.01		
	Annual (ton/yr)	VOC: 0.16 HAP: <0.01		
Estimation Method <sup>5</sup>		EPA		
Notes:				
<sup>1</sup> BF = Bottom Fill    SP = Splash Fill    SUB = Submerged Fill				
<sup>2</sup> At maximum bulk liquid temperature				
<sup>3</sup> B = Ballasted Vessel, C = Cleaned, U = Uncleaned (dedicated service), O = other (describe)				
<sup>4</sup> 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				
<sup>5</sup> EPA = EPA Emission Factor as stated in AP-42 MB = Material Balance TM = Test Measurement based upon test data submittal O = other (describe)				

<b>10. Proposed Monitoring, Recordkeeping, Reporting, and Testing</b>	
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.	
<b>MONITORING</b> <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>  None	<b>RECORDKEEPING</b> <i>Please describe the proposed recordkeeping that will accompany the monitoring.</i>  None
<b>REPORTING</b> <i>Please describe the proposed frequency of reporting of the recordkeeping.</i>  None	<b>TESTING</b> <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 *(not applicable)***

# ATTACHMENT I

## Emission Calculations

Company Name: EOT Production, LLC  
 Facility Name: OXF-45 Pad  
 Project Description: G-70A Permit Application

**Site Wide Summary**

Emission Source	Value	Units	Emission Unit ID(s)	Emission Point ID(s)	Control Device
Well(s)	1	per pad	---	---	---
Storage Tank(s)	3	per pad	S001 - S003	E001 - E003	None
Line Heater(s)	0	per pad	---	---	---
Thermoelectric Generator(s) (TEGs)	1	per pad	S004	E004	None
Dehydrator(s)	0	per pad	---	---	---
Reboiler(s)	0	per pad	---	---	---
Tank Combustor(s)	0	per pad	---	---	---
Dehy Combustor(s)	0	per pad	---	---	---
Length of lease road	1,584	feet	---	---	---

Constituent	Produced Fluids Storage Tanks	TEGs (tpy)	Fugitive Components (tpy)	Liquid Loading (tpy)	Haul Roads (tpy)	Total Emissions (tpy)
	(tpy)					
<b>Criteria Pollutants</b>						
NO <sub>x</sub>	---	4.76E-03	---	---	---	4.76E-03
CO	---	4.00E-03	---	---	---	4.00E-03
PM Total	---	3.62E-04	---	---	0.62	0.62
PM <sub>10</sub> Total	---	3.62E-04	---	---	0.16	0.16
PM <sub>2.5</sub> Total	---	3.62E-04	---	---	0.02	0.02
SO <sub>2</sub>	---	2.85E-05	---	---	---	2.85E-05
VOC	15.41	2.62E-04	2.44	0.16	---	18.02
<b>Greenhouse Gases</b>						
CO <sub>2</sub>	---	6.64	0.03	---	---	7
CH <sub>4</sub>	4.98	1.25E-04	4.63	---	---	9.61
N <sub>2</sub> O	---	1.25E-05	---	---	---	1.25E-05
CO <sub>2</sub> e	124.50	6.65	115.67	---	---	247
<b>Hazardous Air Pollutants</b>						
Methylnaphthalene (2-)	---	1.14E-09	---	---	---	1.14E-09
Methylchloranthrene (3-)	---	8.56E-11	---	---	---	8.56E-11
Dimethylbenz(a)anthracene (7,12-)	---	7.61E-10	---	---	---	7.61E-10
Acenaphthene	---	8.56E-11	---	---	---	8.56E-11
Acenaphthylene	---	8.56E-11	---	---	---	8.56E-11
Anthracene	---	1.14E-10	---	---	---	1.14E-10
Benz(a)anthracene	---	8.56E-11	---	---	---	8.56E-11
Benzene	6E-03	9.99E-08	1.95E-03	8.17E-05	---	8.03E-03
Benzo(a)pyrene	---	5.71E-11	---	---	---	5.71E-11
Benzo(b)fluoranthene	---	8.56E-11	---	---	---	8.56E-11
Benzo(g,h,i)perylene	---	5.71E-11	---	---	---	5.71E-11
Benzo(k)fluoranthene	---	8.56E-11	---	---	---	8.56E-11
Chrysene	---	8.56E-11	---	---	---	8.56E-11
Dibenzo(a,h)anthracene	---	5.71E-11	---	---	---	5.71E-11
Dichlorobenzene	---	5.71E-08	---	---	---	5.71E-08
Fluoranthene	---	1.43E-10	---	---	---	1.43E-10
Fluorene	---	1.33E-10	---	---	---	1.33E-10
Formaldehyde	---	3.57E-06	---	---	---	3.57E-06
Hexane, n-	2E-01	8.56E-05	0.08	3.40E-03	---	2.59E-01
Indeno(1,2,3-cd)pyrene	---	8.56E-11	---	---	---	8.56E-11
Naphthalene	---	2.90E-08	---	---	---	2.90E-08
Phenanthrene	---	8.09E-10	---	---	---	8.09E-10
Pyrene	---	2.38E-10	---	---	---	2.38E-10
Toluene	9E-03	1.62E-07	4.61E-03	1.55E-04	---	1.38E-02
Arsenic	---	9.52E-09	---	---	---	9.52E-09
Beryllium	---	5.71E-10	---	---	---	5.71E-10
Cadmium	---	5.23E-08	---	---	---	5.23E-08
Chromium	---	6.66E-08	---	---	---	6.66E-08
Cobalt	---	4.00E-09	---	---	---	4.00E-09
Manganese	---	1.81E-08	---	---	---	1.81E-08
Mercury	---	1.24E-08	---	---	---	1.24E-08
Nickel	---	9.99E-08	---	---	---	9.99E-08
Selenium	---	1.14E-09	---	---	---	1.14E-09
Ethylbenzene	<0.001	---	---	8.64E-06	---	8.64E-06
Trimethylpentane (2,2,4-)	<0.001	---	0.04	7.32E-06	---	4.43E-02
Xylene	3E-03	---	2.65E-03	1.17E-04	---	5.77E-03
<b>Total HAP</b>	<b>0.18</b>	<b>8.98E-05</b>	<b>0.13</b>	<b>3.76E-03</b>	<b>---</b>	<b>0.32</b>

**Company Name:** EQT Production, LLC  
**Facility Name:** OXF-45 Pad  
**Project Description:** G-70A Permit Application

**Produced Fluids Storage Tanks**

Throughput Parameter	Value	Units
Operational Hours	8,760	hrs/yr
Total Condensate Throughput	49	bbbl/month
Total Produced Water Throughput	3,217	bbbl/month

Description	Potential Throughput <sup>1</sup> (gal/yr)
Produced Water and Condensate	1,646,064

<sup>1</sup> Based on maximum produced water and condensate production for the OXF-45 wellpad.

**Storage Tanks (210 bbl, each) - Uncontrolled (Per tank)**

Constituent	Total Emissions <sup>1</sup>	
	lb/hr	tpy
Methane	0.379	1.660
Ethane	0.601	2.632
Propane	0.615	2.694
Isobutane	0.121	0.528
n-Butane	0.247	1.082
Isopentane	0.073	0.319
n-Pentane	0.062	0.271
n-Hexane	0.013	0.059
Other Hexanes	0.018	0.080
Heptanes	0.016	0.072
Benzene	<0.001	0.002
Toluene	0.001	0.003
Ethylbenzene	<0.001	<0.001
Xylenes	<0.001	0.001
2,2,4-Trimethylpentane	<0.001	0.000
C8+ Heavies	0.006	0.028
<b>Total Emissions:</b>	2.161	9.467
<b>Total VOC Emissions:</b>	1.173	5.138
<b>Total HAP Emissions:</b>	0.014	0.060

<sup>1</sup> E&P TANK v2.0 calculates working, breathing and flashing losses and reports the sum as one total.

<sup>2</sup> E&P TANK v2.0 emission calculations are based on 5/14/2013 condensate sample from the nearby OXF-44 Wellpad.

**Company Name:** EQT Production, LLC  
**Facility Name:** OXF-45 Pad  
**Project Description:** G-70A Permit Application

**Thermoelectric Generators (TEGs)**

Parameter	Value	Units
Manufacturer	Global Thermoelectric	
Fuel Used	Natural Gas	
Higher Heating Value (HHV)	1,193	BTU/scf
Heat Input	0.013	MMBtu/hr (each)
Fuel Consumption <sup>1</sup>	1.09E-05	MMscf/hr (each)
Potential Annual Hours of Operation	8,760	hr/yr

<sup>1</sup> Global Thermoelectric specification sheet states 311 f<sup>3</sup>/day at 1000 BTU/ft<sup>3</sup>.

**Criteria and Manufacturer Specific Pollutant Emission Rates:**

Pollutant	Emission Factor (lb/MMscf) <sup>1</sup>	Potential Emissions	
		(lb/hr) <sup>2</sup>	(tons/yr) <sup>3</sup>
NO <sub>x</sub>	100	0.001	0.005
CO	84	0.001	0.004
SO <sub>2</sub>	0.6	6.52E-06	2.85E-05
PM Total	7.6	8.26E-05	3.62E-04
PM Condensable	5.7	6.19E-05	2.71E-04
PM <sub>10</sub> (Filterable)	1.9	2.06E-05	9.04E-05
PM <sub>2.5</sub> (Filterable)	1.9	2.06E-05	9.04E-05
VOC	5.5	5.97E-05	2.62E-04
Lead	5.00E-04	5.43E-09	2.38E-08
CO <sub>2</sub> (Natural Gas Firing) <sup>4</sup>	139,558	2	7
CH <sub>4</sub> (Natural Gas Firing) <sup>4</sup>	2.6	2.86E-05	1.25E-04
N <sub>2</sub> O (Natural Gas Firing) <sup>4</sup>	0.26	2.86E-06	1.25E-05

Company Name: EQT Production, LLC  
 Facility Name: OXF-45 Pad  
 Project Description: G-70A Permit Application

**Thermoelectric Generators (TEGs)**

**Hazardous Air Pollutant (HAP) Potential Emissions:**

Pollutant	Emission Factor (lb/MMscf) <sup>1</sup>	Potential Emissions	
		(lb/hr) <sup>2</sup>	(tons/yr) <sup>3</sup>
<b><u>HAPs:</u></b>			
Methylnaphthalene (2-)	2.40E-05	2.61E-10	1.14E-09
3-Methylchloranthrene	1.80E-06	1.96E-11	8.56E-11
7,12-Dimethylbenz(a)anthracene	1.60E-05	1.74E-10	7.61E-10
Acenaphthene	1.80E-06	1.96E-11	8.56E-11
Acenaphthylene	1.80E-06	1.96E-11	8.56E-11
Anthracene	2.40E-06	2.61E-11	1.14E-10
Benz(a)anthracene	1.80E-06	1.96E-11	8.56E-11
Benzene	2.10E-03	2.28E-08	9.99E-08
Benzo(a)pyrene	1.20E-06	1.30E-11	5.71E-11
Benzo(b)fluoranthene	1.80E-06	1.96E-11	8.56E-11
Benzo(g,h,i)perylene	1.20E-06	1.30E-11	5.71E-11
Benzo(k)fluoranthene	1.80E-06	1.96E-11	8.56E-11
Chrysene	1.80E-06	1.96E-11	8.56E-11
Dibenzo(a,h) anthracene	1.20E-06	1.30E-11	5.71E-11
Dichlorobenzene	1.20E-03	1.30E-08	5.71E-08
Fluoranthene	3.00E-06	3.26E-11	1.43E-10
Fluorene	2.80E-06	3.04E-11	1.33E-10
Formaldehyde	7.50E-02	8.15E-07	3.57E-06
Hexane	1.80E+00	1.96E-05	8.56E-05
Indo(1,2,3-cd)pyrene	1.80E-06	1.96E-11	8.56E-11
Naphthalene	6.10E-04	6.63E-09	2.90E-08
Phenanthrene	1.70E-05	1.85E-10	8.09E-10
Pyrene	5.00E-06	5.43E-11	2.38E-10
Toluene	3.40E-03	3.69E-08	1.62E-07
Arsenic	2.00E-04	2.17E-09	9.52E-09
Beryllium	1.20E-05	1.30E-10	5.71E-10
Cadmium	1.10E-03	1.19E-08	5.23E-08
Chromium	1.40E-03	1.52E-08	6.66E-08
Cobalt	8.40E-05	9.13E-10	4.00E-09
Manganese	3.80E-04	4.13E-09	1.81E-08
Mercury	2.60E-04	2.82E-09	1.24E-08
Nickel	2.10E-03	2.28E-08	9.99E-08
Selenium	2.40E-05	2.61E-10	1.14E-09
<b>Total HAP</b>		<b>2.05E-05</b>	<b>8.98E-05</b>

<sup>1</sup> Emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, & 1.4-3

<sup>2</sup> Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf)

<sup>3</sup> Annual Emissions (tons/yr)<sub>Potential</sub> = (lb/hr)<sub>Emissions</sub> × (Maximum Allowable Operating Hours, 8760 hr/yr) × (1 ton/2000 lb).

<sup>4</sup> GHG Emission factors from Tables C-1 and C-2, 40 CFR 98, Subpart C.

Company Name: EOT Production, LLC  
 Facility Name: OXF-45 Pad  
 Project Description: G-70A Permit Application

**Fugitive Components**

Component Counts	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

<sup>1</sup> 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 <sup>1</sup> (kg/hr/source)	Facility Equipment Count <sup>2</sup> (units)	TOC Total Fugitive Emissions (lb/hr)	TOC Annual Fugitive Emissions (tpy)
Valves	Gas	0.005970	59	0.78	3.40
Pump Seals	Light Liquid	0.019900	1	0.04	0.19
Pressure Relief Valves	Gas	0.104000	6	1.38	6.03
Connectors	All	0.001830	101	0.41	1.78
Open-Ended Lines	All	0.001700	1	0.00	0.02
<b>Emission Totals:</b>				<b>2.61</b>	<b>11.42</b>

<sup>1</sup> U.S. EPA. Office of Air Quality Planning and Standards. *Protocol for Equipment Leak Emission Estimates*. Table 2-1. (Research Triangle Park, NC: U.S. EPA EPA-453/R-95-017, 1995). SOCMI factors were used as it was representative of natural gas liquids extraction.

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

**VOC and HAP Weight Fractions<sup>1</sup>**

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	0.2000	0.0070	0.0002	0.0004	0.0000	0.0039	0.0002
Light Liquid	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
All	0.2000	0.0070	0.0002	0.0004	0.0000	0.0039	0.0002

<sup>1</sup> All weight fractions from the same representative gas analyses used for other emission calculation

Company Name: EOI Production, LLC  
 Facility Name: OXE-45 Pad  
 Project Description: G-70A Permit Application

**Fugitive Components**

**VOC and HAP Fugitive Emissions**

Pollutant	Hourly Fugitive Emissions (lb/hr)	Annual Fugitive Emissions (tpy)
VOC	0.557	2.44
Hexane	0.018	0.079
Benzene	0.000	0.002
Toluene	0.001	0.005
Ethylbenzene	0.000	0.000
2,2,4-trimethylpentane	0.010	0.044
Xylene	0.001	0.003
Total HAP	0.03	0.13

**GHG Fugitive Emissions from Component Leaks**

Component	Component Count	GHG Emission Factor <sup>2</sup> (scf/hr/component)	CH <sub>4</sub> Emissions <sup>3,4</sup> (tpy)	CO <sub>2</sub> Emissions <sup>3,4</sup> (tpy)	CO <sub>2</sub> e Emissions <sup>5</sup> (tpy)
Connectors	101	3.00E-03	4.35E-02	3.23E-04	1.09E+00
Open-Ended Lines	1	6.10E-02	8.76E-03	6.51E-05	2.19E-01
Pressure Relief Devices	6	4.00E-02	3.45E-02	2.56E-04	8.62E-01
Pneumatic Devices	5	6.00E+00	4.31E+00	3.20E-02	1.08E+02
Valves	59	2.70E-02	2.29E-01	1.70E-03	5.72E+00
<b>Total</b>			<b>4.6</b>	<b>0.034</b>	<b>116</b>

<sup>1</sup> The component count for pneumatics assumes 5 pneumatics per well

<sup>2</sup> Population emission factors for gas service in the Eastern U.S. from Table W-1A of Subpart W - Default Whole Gas Emission Factors for Onshore Production, 40 CFR 98, Subpart W, except for pneumatics, which are set at NSPS OOOO limits.

<sup>3</sup> Calculated in accordance with Equations W-31, W-35 and W-36 in Subpart W of 40 CFR 98.

<sup>4</sup> Mole fractions of CH<sub>4</sub> and CO<sub>2</sub> based on gas analysis:

CH <sub>4</sub>	77.49%	CO <sub>2</sub>	0.21%
Carbon Dioxide (CO <sub>2</sub> )	1	Methane (CH <sub>4</sub> )	25

<sup>5</sup> Carbon equivalent emissions (CO<sub>2</sub>e) are based on the following Global Warming Potentials (GWP) from 40 CFR Part 98, Table A-1:

Company Name: **EOT Production, LLC**  
 Facility Name: **OXF-45 Pad**  
 Project Description: **G-70A Permit Application**

**Liquid Loading**

**Liquid Loading Losses:**

Uncontrolled Loading Losses:  $L_L$  (lb/10<sup>3</sup> gal) = 12.46 (SPM)/T

Controlled Loading Losses:  $L_L$  (lb/10<sup>3</sup> 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	0%	No collection
Control Efficiency	0%	No control
P	0.29	max true vapor pressure of liquid loaded (psia) - TANKS Data
M	19.14	molecular weight of vapors (lb/lb-mol) - TANKS Data
T	511.0	temperature of liquids loaded (deg R) - TANKS Data

Description	Loading Losses (lb/10 <sup>3</sup> gal)	Maximum Throughput <sup>1</sup> (gal)	VOC Emissions	
			Uncontrolled (tpy)	Controlled (tpy)
Liquids Hauling	0.2	1,646,064	0.16	0.16

<sup>1</sup> Sum of the annual throughput from each well at the pad.

**Speciated HAP Emission Potential:**

Constituent	mol% <sup>1</sup>	True Vapor Pressure of Organic Compounds in liquid (psia) <sup>2</sup>	Partial Vapor Pressure (psia)	Mole Fraction	Molecular Weight	VOC Vapor Weight	Speciated Weight Fraction	Speciated Liquid Loading Emissions (tpy) <sup>3</sup>
Methane	0.095	---	---	---	---	---	---	---
Ethane	0.602	---	---	---	---	---	---	---
Propane	1.646	127.310	2.10	0.32	44.10	14.13	0.20	0.03
Isobutane	0.867	46.110	0.40	0.06	58.12	3.55	0.05	0.01
n-Butane	2.986	32.045	0.96	0.15	58.12	8.51	0.12	0.02
Isopentane	3.103	12.530	0.39	0.06	72.15	4.29	0.06	0.01
n-Pentane	3.943	8.433	0.33	0.05	72.15	3.67	0.05	0.01
n-Hexane	4.692	2.436	0.11	0.02	85.67	1.50	0.02	3.40E-03
Other Hexanes	4.939	2.436	0.12	0.02	86.18	1.59	0.02	3.59E-03
Heptanes	14.686	0.735	0.11	0.02	97.88	1.62	0.02	3.66E-03
Benzene	0.200	1.508	3.02E-03	4.61E-04	78.11	0.04	4.99E-04	8.17E-05
Toluene	1.138	0.425	4.84E-03	7.40E-04	92.14	0.07	9.45E-04	1.55E-04
Ethylbenzene	0.155	0.151	2.35E-04	3.59E-05	106.17	0.00	5.28E-05	8.64E-06
Xylenes	1.763	0.180	3.17E-03	4.85E-04	106.17	0.05	7.13E-04	1.17E-04
2,2,4-Trimethylpentane	0.031	0.596	1.85E-04	2.83E-05	114.23	0.00	4.47E-05	7.32E-06
C8+ Heavies	59.154	3.4	2.01	0.31	107.73	33.14	0.46	0.08
	100.0		6.54			72.15	1.00	
<b>Total Emissions:</b>								0.16
<b>Total HAP Emissions:</b>								0.004

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

<sup>2</sup> 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)

<sup>3</sup> 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: OXF-45 Pad  
 Project Description: G-70A Permit Application

**Haul Roads**

Estimated Potential Road Fugitive Emissions

**Unpaved Road Emissions**

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

	PM	PM <sub>10</sub>	PM <sub>2.5</sub>	
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	PM <sub>10</sub>	PM <sub>2.5</sub>
Liquids Hauling	20	40	30	0.60	412	247	0	0.53	0.13	0.013
Employee Vehicles	3	3	3	0.60	200	120	0	0.09	0.02	0.002
<b>Total Potential Emissions</b>								<b>0.62</b>	<b>0.16</b>	<b>0.02</b>

20141210\_EQT\_OXF-45\_Produced Fluids Tanks.txt

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\* Project Setup Information

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Project File : \\tsclient\Z\Client\EQT Corporation\West Virginia\WV  
Production Wells\143901.0023\OXF 45\02 Draft\2014-1209\_Draft\_OXF-45\_G70  
Application\Attach I - Emission Calcs\E&P Tank\20141210\_EQT\_OXF-45\_Produced Fluids  
Tanks.ept  
Flowsheet Selection : Oil Tank with Separator  
Calculation Method : RVP Distillation  
Control Efficiency : 100.0%  
Known Separator Stream : Low Pressure Oil  
Entering Air Composition : No

Filed Name : Produced Fluids Tanks  
Well Name : OXF-45  
Date : 2014.12.10

\*\*\*\*\*  
\*\*\*\*\*

\* Data Input

\*\*\*\*\*  
\*\*\*\*\*

Separator Pressure : 415.00[psig]  
Separator Temperature : 60.00[F]  
Ambient Pressure : 14.70[psia]  
Ambient Temperature : 55.00[F]  
C10+ SG : 0.8059  
C10+ MW : 164.943

-- Low Pressure Oil

No.	Component	mol %
1	H2S	0.0000
2	O2	0.0000
3	CO2	0.0860
4	N2	0.0000
5	C1	10.7540
6	C2	9.1140
7	C3	8.0330
8	i-C4	2.1420
9	n-C4	5.8590
10	i-C5	3.3660
11	n-C5	3.9850
12	C6	3.4760
13	C7	9.3440
14	C8	9.6700
15	C9	5.5240
16	C10+	23.5290
17	Benzene	0.1590
18	Toluene	0.6780
19	E-Benzene	0.0870
20	Xylenes	0.8530
21	n-C6	3.3190
22	2,2,4-Trimethylp	0.0220

-- Sales Oil

20141210\_EQT\_OXF-45\_Produced Fluids Tanks.txt

-----  
 Production Rate : 1.7[bb1/day]  
 Days of Annual Operation : 365 [days/year]  
 API Gravity : 59.11  
 Reid Vapor Pressure : 10.60[psia]

\*\*\*\*\*  
 \*\*\*\*\*  
 \* Calculation Results  
 \*  
 \*\*\*\*\*  
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-- Emission Summary

Item	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]
Total HAPs	0.060	0.014
----- E&P TANK		
Total HC	9.431	2.153
VOCs, C2+	7.771	1.774
VOCs, C3+	5.138	1.173

Uncontrolled Recovery Info.

Vapor	605.4000	x1E-3	[MSCFD]
HC Vapor	603.6800	x1E-3	[MSCFD]
GOR	356.12		[SCF/bbl]

-- Emission Composition

No	Component	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]
1	H2S	0.000	0.000
2	O2	0.000	0.000
3	CO2	0.036	0.008
4	N2	0.000	0.000
5	C1	1.660	0.379
6	C2	2.632	0.601
7	C3	2.694	0.615
8	i-C4	0.528	0.121
9	n-C4	1.082	0.247
10	i-C5	0.319	0.073
11	n-C5	0.271	0.062
12	C6	0.080	0.018
13	C7	0.072	0.016
14	C8	0.023	0.005
15	C9	0.004	0.001
16	C10+	0.001	0.000
17	Benzene	0.002	0.000
18	Toluene	0.003	0.001
19	E-Benzene	0.000	0.000
20	Xylenes	0.001	0.000
21	n-C6	0.059	0.013
22	224Trimethylp	0.000	0.000
	Total	9.467	2.161

-- Stream Data

No. Component	MW	LP Oil	Flash Oil	sale Oil	Flash Gas	w&S Gas
Total Emissions						

20141210\_EQT\_OXF-45\_Produced Fluids Tanks.txt

	mol %	mol %	mol %	mol %	mol %
1 H2S	34.80	0.0000	0.0000	0.0000	0.0000
0.0000					
2 O2	32.00	0.0000	0.0000	0.0000	0.0000
0.0000					
3 CO2	44.01	0.0860	0.0067	0.0000	0.2945
0.2839					
4 N2	28.01	0.0000	0.0000	0.0000	0.0000
0.0000					
5 C1	16.04	10.7540	0.2446	0.0000	38.3793
35.5008					
6 C2	30.07	9.1140	1.3993	0.0247	29.3931
30.0300					
7 C3	44.10	8.0330	3.8600	2.4161	19.0022
20.9588					
8 i-C4	58.12	2.1420	1.8061	1.7185	3.0249
3.1166					
9 n-C4	58.12	5.8590	5.7117	5.6304	6.2462
6.3851					
10 i-C5	72.15	3.3660	4.0792	4.1700	1.4913
1.5158					
11 n-C5	72.15	3.9850	5.0194	5.1573	1.2660
1.2873					
12 C6	86.16	3.4760	4.6757	4.8437	0.3224
0.3286					
13 C7	100.20	9.3440	12.8046	13.2946	0.2473
0.2529					
14 C8	114.23	9.6700	13.3229	13.8419	0.0679
0.0697					
15 C9	128.28	5.5240	7.6212	7.9194	0.0113
0.0118					
16 C10+	164.94	23.5290	32.4794	33.7530	0.0018
0.0019					
17 Benzene	78.11	0.1590	0.2158	0.2238	0.0097
0.0100					
18 Toluene	92.13	0.6780	0.9322	0.9683	0.0097
0.0100					
19 E-Benzene	106.17	0.0870	0.1200	0.1247	0.0003
0.0004					
20 xylenes	106.17	0.8530	1.1764	1.2224	0.0029
0.0030					
21 n-C6	86.18	3.3190	4.4946	4.6599	0.2287
0.2333					
22 224Trimethylp	114.24	0.0220	0.0302	0.0314	0.0005
0.0005					
MW	90.97	113.51	116.39	31.70	40.27
32.48					
Stream Mole Ratio	1.0000	0.7244	0.6971	0.2756	0.0273
0.3029					
Heating Value [BTU/SCF]				1844.52	2307.85
1886.33					
Gas Gravity [Gas/Air]				1.09	1.39
1.12					
Bubble Pt. @ 100F [psia]	444.51	31.48	12.29		
RVP @ 100F [psia]	116.27	18.47	10.68		

Page 2-----E&P TANK

Spec. Gravity @ 100F 0.678 0.714 0.718

20141210\_EQT\_OXF-45\_Produced Fluids Tanks.txt





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

**Certificate of Analysis : 13050161-003A**

<b>Company:</b>	Gas Analytical Services	<b>For:</b>	Gas Analytical Services
<b>Well:</b>	OXF 44 Pad		Alan Ball
<b>Field:</b>	EQT Production		PO Box 1028
<b>Sample of:</b>	Condensate-Spot		
<b>Conditions:</b>	415 @ N.G.		Bridgeport, WV, 26330
<b>Sampled by:</b>	GR-GAS		
<b>Sample date:</b>	5/14/2013	<b>Report Date:</b>	5/29/2013
<b>Remarks:</b>	Cylinder No.: GAS		
<b>Remarks:</b>			

<u>Analysis: ( GPA 2186M )</u>	<u>Mol. %</u>	<u>MW</u>	<u>Wt. %</u>	<u>Sp. Gravity</u>	<u>L.V. %</u>
Nitrogen	0.000	28.013	0.000	0.8094	0.000
Methane	10.754	16.043	1.896	0.3000	4.345
Carbon Dioxide	0.086	44.010	0.042	0.8180	0.035
Ethane	9.114	30.070	3.011	0.3562	5.807
Propane	8.033	44.097	3.892	0.5070	5.273
Iso-butane	2.142	58.123	1.368	0.5629	1.670
N-butane	5.859	58.123	3.742	0.5840	4.403
Iso-pentane	3.366	72.150	2.668	0.6244	2.936
N-pentane	3.985	72.150	3.159	0.6311	3.440
i-Hexanes	3.476	86.177	3.248	0.6795	3.363
n-Hexane	3.319	85.651	3.146	0.6640	3.241
2,2,4 trimethylpentane	0.022	114.231	0.027	0.6967	0.027
Benzene	0.159	78.114	0.120	0.8846	0.107
Heptanes	9.344	97.403	10.046	0.7049	9.805
Toluene	0.678	92.141	0.605	0.8719	0.543
Octanes	9.670	107.823	11.654	0.7475	10.728
E-benzene	0.087	106.167	0.041	0.8718	0.080
M-,O-,P-xylene	0.853	106.167	0.995	0.8731	0.790
Nonanes	5.524	123.026	7.701	0.7595	7.037
Decanes Plus	23.529	164.943	42.639	0.8059	36.370
	-----		-----		-----
	100.000		100.000		100.000

<b>Calculated Values</b>	<b>Total Sample</b>	<b>Decanes Plus</b>
Specific Gravity at 60 °F	0.6873	0.8059
Api Gravity at 60 °F	74.375	44.087
Molecular Weight	91.017	164.943
Pounds per Gallon (In Vacuum)	5.730	6.719
Pounds per Gallon (in Air)	5.724	6.711
Cu. Ft. Vapor per Gallon @ 14.73 psia	23.947	15.422

**Southern Petroleum Laboratories, Inc.**



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

**Certificate of Analysis : 13050161-003A**

<b>Company:</b>	Gas Analytical Services	<b>For:</b>	Gas Analytical Services
<b>Well:</b>	OXF 44 Pad		Alan Ball
<b>Field:</b>	EQT Production		PO Box 1028
<b>Sample of:</b>	Condensate-Spot		
<b>Conditions:</b>	415 @ N.G.		Bridgeport, WV, 26330
<b>Sampled by:</b>	GR-GAS	<b>Report Date:</b>	5/29/2013
<b>Sample date:</b>	5/14/2013		
<b>Remarks:</b>	Cylinder No.: GAS		
<b>Remarks:</b>			

<u>Analysis: ( GPA 2103M )</u>	<u>Mol. %</u>	<u>MW</u>	<u>Wt. %</u>	<u>Sp. Gravity</u>	<u>L.V. %</u>
Nitrogen	0.000	28.013	0.000	0.8094	0.000
Methane	10.754	16.043	1.896	0.3000	4.345
Carbon Dioxide	0.086	44.010	0.042	0.8180	0.035
Ethane	9.114	30.070	3.011	0.3562	5.807
Propane	8.033	44.097	3.892	0.5070	5.273
Iso-butane	2.142	58.123	1.368	0.5629	1.670
N-butane	5.859	58.123	3.742	0.5840	4.403
Iso-pentane	3.366	72.150	2.668	0.6244	2.936
N-pentane	3.985	72.150	3.159	0.6311	3.440
Hexanes	6.795	85.651	6.394	0.6655	6.604
Heptanes Plus	49.866	97.403	73.828	0.7049	65.487
	100.000		100.000		100.000

<b>Calculated Values</b>	<b>Total Sample</b>	<b>Heptanes Plus</b>
Specific Gravity at 60 °F	0.6873	0.7768
Api Gravity at 60 °F	74.375	50.667
Molecular Weight	91.017	134.755
Pounds per Gallon (in Vacuum)	5.730	6.476
Pounds per Gallon (in Air)	5.724	6.469
Cu. Ft. Vapor per Gallon @ 14.73 psia	23.947	18.280
Standing-Katz Density (lb. / ft <sup>3</sup> )		

**Southern Petroleum Laboratories, Inc.**



# Certificate of Analysis

Number: 2030-13050161-003A

Carencro Laboratory  
4790 NE Evangeline Thruway  
Carencro, LA 70520

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

May 22, 2013

Station Name: OXF 44 Pad  
Station Number: 512419  
Station Location: EQT Production  
Sample Point: Wellhead

Sampled By: GR-GAS  
Sample Of: Condensate  
Sample Date: 05/14/2013 15:30  
Sample Conditions: 415 psig  
Cylinder No: GAS

## Analytical Data

Test	Method	Result	Units	Detection Limit	Lab Tech.	Analysis Date
Color-Visual	Proprietary	STRAW			AR	05/22/2013
API Gravity @ 60° F	ASTM D-5002	60.41			AR	05/22/2013
Specific Gravity @ 60/60° F	ASTM D-5002	0.7373			AR	05/22/2013
Density @ 60° F	ASTM D-5002	0.7366	g/ml		AR	05/22/2013
Shrinkage Factor	Proprietary	0.8448			AR	05/22/2013
Flash Factor	Proprietary	304.2372	Cu. Ft./S.T. Bbl		AR	05/22/2013

Hydrocarbon Laboratory Manager

**Quality Assurance:**

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

130 Sollel

Gas Analytical Services, Inc.



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

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

Date: 5/15/2013

Testing Requested

\*\* SCF Base Conditions: P<sub>b</sub> 14.73 psia / T<sub>b</sub>: 60 Df

Client	Location	Date of Collection	Sulfur Speciation (GPA-2199)	Extended		Gas Temperature
				Total Sulfur (GPA-2199)	C1..C10 (GPA-2286)	
1	EQT Production	5/14/2013			X	
2	OXF 152 Pad (512496)	5/14/2013			X	
3	131 Pad (512441)	5/14/2013			X	
4	EQT Production	5/14/2013			X	
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						

*Alan Ball*

Please email results to:  
lab@gasana.com

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

*[Signature]*  
Received by: *Spoll*

**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 the existing natural gas production wellpad OXF-45. The facility is located in Doddridge County, West Virginia near Straight Fork Road, Cox Mills, WV at 39.13921, -80.81551.

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

Pollutant	Emissions (tons per year)
NO <sub>x</sub>	<0.01
CO	<0.01
VOC	18.02
SO <sub>2</sub>	<0.01
PM	0.62
Total HAPs	0.32
Carbon Dioxide Equivalents (CO <sub>2</sub> e)	247

Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57<sup>th</sup> Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

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

Dated this the 22 day of December, 2014.

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

**ATTACHMENT K**

**Electronic Submittal (*not applicable*)**

**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 <sup>1</sup>	Emission Unit Vented Through This Point		Air Pollution Control Device		All Regulated Pollutants - Chemical Name/CAS <sup>2</sup> (Speciate VOCs & HAPs)	Maximum Potential Uncontrolled Emissions <sup>3</sup>		Maximum Potential Controlled Emissions <sup>4</sup>		Emission Form or Phase <i>(At exit conditions, Solid, Liquid or Gas/Vapor)</i>	Est. Method Used <sup>5</sup>
		ID No.	Source	ID No.	Device Type		lb/hr	ton/yr	lb/hr	ton/yr		
E001 - E003 (Total-All Tanks)	Rain Cap	S001 - S003	Produced Fluids Tanks	None	---	VOC HAPs	3.52	15.41	3.52	15.41	Gas/Vapor	E&P Tank v2.0
							0.04	0.18	0.04	0.18		
E004	Upward vertical stack	S004	TEG	None	---	NOx CO PM/PM <sub>10</sub> /PM <sub>2.5</sub> SO <sub>2</sub> VOC CO <sub>2s</sub>	0.001	0.005	0.001	0.005	Gas/Vapor	AP-42
							0.001	0.004	0.001	0.004		
E005	Upward vertical stack	S005	Liquid Loading	None	---	VOC HAPs	0.04	0.16	0.04	0.16	Gas/Vapor	AP-42
							<0.01	<0.01	<0.01	<0.01		

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.

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

<sup>2</sup> List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS<sub>2</sub>, VOCs, H<sub>2</sub>S, Inorganics, Lead, Organics, O<sub>3</sub>, NO, NO<sub>2</sub>, SO<sub>2</sub>, SO<sub>x</sub>, all applicable Greenhouse Gases (including CO<sub>2</sub> and methane), etc. DO NOT LIST H<sub>2</sub>, H<sub>2</sub>O, N<sub>2</sub>, O<sub>2</sub>, and Noble Gases

<sup>3</sup> 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)

<sup>4</sup> 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)

<sup>5</sup> 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).