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Pittsburgh PA 15222
www.eqt.com

TEL: (412) 395-3699
FAX: (412) 395-2156

Alex Bosiljevac
Environmental Coordinator

November 4, 2015

CERTIFIED MAIL # 7015 0640 0000 9694 3796

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 Application
EQT Production Company
GLO-76 Natural Gas Production Site

Dear Mr. Durham,

Enclosed are two electronic copies and one original hard copy of a proposed G70-A General Air Permit for the GLO-76 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,

KAB

Alex Bosiljevac
EQT Corporation

Enclosures

PROJECT REPORT

EQT Production
GLO-76 Pad

G70-A Permit Application

Where energy meets innovation.

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

October 2015

Trinity Consultants

Environmental solutions delivered uncommonly well

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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 construction and operation of a new natural gas production well pad, GLO-76, to be located in Marion County, West Virginia.

1.1. FACILITY AND PROJECT DESCRIPTION

The GLO-76 pad is a natural gas production facility that will consist of nine (9) 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 facility is not expected to produce condensate.

This application seeks to permit the following equipment at the GLO-76 pad:

- Ten (10) 400 barrel (bbl) storage tanks for produced fluids,
- One (1) 140 bbl storage tank for sand and produced fluids from the sand separator;
- Nine (9) line heaters, each rated at 1.54 MMBtu/hr (heat input),
- Three (3) thermoelectric generators (TEG), each rated at 0.013 MMBtu/hr,
- One (1) 65 million standard cubic feet per day (MMscfd) triethylene glycol dehydration unit with associate reboiler (rated at 0.75 MMBtu/hr heat input). Emissions from the dehy will be control by an enclosed combustor rated at 8.33 MMBtu/hr (The dehy will also be equipped with a BTEX condenser; however, no emission reduction credit is being claimed for the condenser),
- One (1) 100 bbl dehy drip fluids tank,
- Produced fluid truck loading, and
- Associated piping and components.

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 GLO-76 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 one-mile radius of the GLO-76 Pad. The nearest wellpad, BIG-182, is located approximately 1.7 miles west of GLO-76. Therefore, the GLO-75 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;
- 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 Waver (*not applicable*);
- Attachment N: Material Safety Data Sheet (*not applicable*); and
- Attachment O: Emissions Summary Sheet.

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 natural gas combustion in the line heaters, TEGs, and reboiler, dehydration enclosed combustor. In addition, emissions will also result from the storage of organic liquids in storage tanks and loading of organic liquids into tank trucks. Fugitive emissions will result from component leaks from the operation of the station. The methods by which emissions from each of these source types, as well as the existing source types, are calculated are summarized below.

- **Reboiler, 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, SO_2 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. The site is not expected to produce condensate, so the estimate condensate throughput is zero. The site's maximum expected produced water throughput is 9,831,213 gallons per year (which is approximately 8 times the maximum monthly throughput at the BIG-192 wellpad, annualized). The E&P Tank throughput takes into account that produced water is conservatively assumed to contain 1% condensate in accordance with guidance from the Texas Commission on Environmental Quality on estimating emissions from produced water.[4,5] This results in a total of 98,312 gallons/year of condensate for all tanks, and approximately 1 bbl/day per tank. This throughput is used in E&P Tank calculations. Below is an example calculation for the total throughput used as an input to E&P Tank on a bbl/day per tank basis.

[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] ENVIRON International Corporation, "Emission Factor Determination for Produced Water Storage Tanks", August 2010, https://www.tceq.texas.gov/assets/public/implementation/air/am/contracts/reports/ei/5820784005FY1024-20100830-environ-%20EmissionFactorDeterminationForProducedWaterStorageTanks.pdf.

[5] https://www.tceq.texas.gov/assets/public/permitting/air/NewSourceReview/oilgas/produced-water.pdf

$$Throughput\ per\ Tank\ \left(\frac{bbl}{day}\right) = \frac{\left(Condensate\ Throughput\ \left(\frac{bbl}{month}\right) + \left(Produced\ Water\ Throughput\ \left(\frac{bbl}{month}\right) * 1\%\ (Condensate\ in\ Produced\ Water)\right) * \frac{12\left(\frac{months}{year}\right)}{365\left(\frac{days}{year}\right)}\right)}{Number\ of\ tanks\ at\ wellpad}$$

- **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.[6]

- **Haul Roads:** Fugitive dust emitted from facility roadways has been estimated using projected vehicle miles traveled along with U.S. EPA's AP-42 factors for unpaved haul roads.[7]

- **Triethylene Glycol Dehydration Unit:** Potential emissions of HAPs, VOC, and methane from the dehy are calculated using GRI-GLYCalc. Controlled emissions assume a total control efficiency of 93% (95% capture, 98% destruction) from the combustor.

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

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

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

- Prevention of Significant Deterioration (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.[8] The potential emissions of all regulated pollutants are below the corresponding threshold(s) at this facility after the proposed project. Therefore, the wellpad is not a major source for Title V purposes.

3.3. NEW SOURCE PERFORMANCE STANDARDS

New Source Performance Standards (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

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

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^3 (~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 will be ten (10) produced fluid storage vessels, one (1) sand separator storage vessel, and one (1) dehydrator drip fluid storage vessel at the wellpad. The storage vessels at the facility will each have uncontrolled 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 OOOO) and associated equipment (Subparts D-Dc and K-Kb), the applicability of a particular NSPS to the wellpad can be readily ascertained based on the industrial source category covered. All other NSPS are categorically not applicable to the proposed project.

3.4. NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (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 GLO-76 wellpad will be an area source of HAP emissions. Even though the dehydration unit at the wellpad is considered an affected area source, it is exempt from the requirements of § 63.764(d)(2) since the actual average benzene emissions from the glycol dehydration unit process vent to the atmosphere is less than 0.90 Mg (1.0 TPY), as determined by the procedures specified in § 63.772(b)(2). However, the facility must maintain records as required in §63.774(d)(1).

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. All proposed units 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 reboiler, TEGs, and line heaters are fuel burning units and therefore must comply with this regulation. Per 45 CSR 2-3, opacity of emissions from units shall not exceed 10 percent. 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 combustor is an incinerator and therefore must comply with this regulation. Per 45 CSR 6-4.3, opacity of emissions from this unit shall not exceed 20 percent, except as provided by 4.4. PM emissions from this unit will not exceed the levels calculated in accordance with 6-4.1

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

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

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

According to 45 CSR 17-3.1:

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

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

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

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

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

45 CSR 34-1 incorporates the federal Clean Air Act (CAA) national emissions standards for hazardous air pollutants (NESHAPs) as set forth in 40 CPR Parts 61 and 63 by reference. As such, by complying with all applicable

requirements of 40 CFR Parts 61 and 63 at the wellpad, EQT will be complying with 45 CSR 34. Note that there are no applicable requirements under 40 CFR Parts 61 and 63 for the wellpad.

3.5.8. Non-Applicability of Other SIP Rules

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

4. G70-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:

☐ **G10-D –** Coal Preparation and Handling
☐ **G20-B –** Hot Mix Asphalt
☐ **G30-D –** Natural Gas Compressor Stations
☐ **G33-A –** Spark Ignition Internal Combustion Engines
☐ **G35-A –** Natural Gas Compressor Stations (Flare/Glycol Dehydration Unit)
☐ **G40-C –** Nonmetallic Minerals Processing
☐ **G50-B –** Concrete Batch
☐ **G60-C** - Class II Emergency Generator
☐ **G65-C –** Class I Emergency Generator
☒ **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:
Mannington, Marion County, WV

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? ☒ **YES** ☐ **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 (SIC) code: 1311

AND

8b. North American Industry System (NAICS) code: 211111

9. DAQ Plant ID No. (for existing facilities only):

10. List all current 45CSR13 and other General Permit numbers associated with this process (for existing facilities only):

_____

_____

A: PRIMARY OPERATING SITE INFORMATION

11A. Facility name of primary operating site:	12A. Address of primary operating site:
GLO-76 Pad	Mailing: 625 Liberty Avenue, Suite 1700, Pittsburgh, PA 15222 Physical: Mannington, WV

13A. Does the applicant own, lease, have an option to buy, or otherwise have control of the proposed site? ☒ **YES** ☐ **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**.

Head North on I-79 to exit 136. At the bottom of the ramp make a left onto Fairmont Gateway Connector, then go 1.2 miles going straight through two traffic circles. Continue straight onto Jefferson St. crossing the bridge, for 0.4 miles. Turn left onto Jackson St. and continue 0.1 miles to U.S. Rt. 250 North. Turn right and go 13.4 miles to Market Street, then turn left. Travel 0.1 miles, continue on Buffalo St. Continue 5.9 miles, then turn left onto Brink Road (Co Rt. 1). Travel 4.5 miles to access road on right.

15A. Nearest city or town:	16A. County:	17A. UTM Coordinates:
Mannington	Marion	Northing (KM): 4,379.489 Easting (KM): 543.845 Zone: 17

18A. Briefly describe the proposed new operation or change (s) to the facility:	19A. Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits):
Construction and operation of nine (9) natural gas wellheads, ten (10) 400-bbl produced fluid storage vessels, nine (9) in-line heaters, three (3) thermoelectric generators, one (1) 140-bbl sand separator storage vessel, one (1) triethylene glycol dehydration unit with associated reboiler and enclosed combustor, and one(1) dehy drip tank,	Latitude: 39.56398° Longitude: -80.48958°

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

11B. Name of 1st alternate operating site:	12B. Address of 1st alternate operating site:
_N/A_	Mailing:_____ Physical:_____

13B. 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.

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 2nd alternate operating site:	12C. Address of 2nd alternate operating site:
_N/A_____	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: _____/_____/__2015___ ☐ If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen: : _____/_____/_____	21. Date of anticipated Start-up if registration is granted: _____/_____/___2015___

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.)

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

G *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 _____ Nov 4, 15

(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

Applicant's Name Alex Bosilevac - Environmental Coordinator

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

Phone 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.

atL006 v.3
L0553297664

ATTACHMENT B

Process Description

ATTACHMENT B: PROCESS DESCRIPTION

This project involves the construction and operation of ten (10) produced fluid storage tanks, one (1) sand separator storage tank, nine (9) line heaters, three (3) thermoelectric generators, one (1) triethylene glycol (TEG) dehydration unit rated at 65 million standard cubic feet per day (MMSCFD) with associated reboiler and enclosed combustor, and one (1) dehy drip fluid tank at a new natural gas production wellpad operation (GLO-76).

The GLO-76 wellpad will consist of nine (9) wells, each with the same basic operation. The incoming gas stream from the underground wells will pass through a sand separator, where sand, water, and residual solids are displaced and transferred to the sand separator tank. The gas will then flow into a separator which separates produced fluids from the gas stream. The produced fluid will be transferred to the storage tanks. Once the tanks are filled, the contents will be loaded into trucks for transport. The wet gas stream from the separator will pass through the TEG dehydration unit to remove excess water from the gas stream. Emissions from the dehydrator will be controlled by an enclosed combustor. Excess produced fluids separated from the dehydrator will be stored at the dehydrator drip tank. At the wellpad, heat will be provided by line heaters and electricity will be 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} $PM_{2.5}$	0.47 0.12 0.01	2.08 0.53 0.05	0.47 0.12 0.01	2.08 0.53 0.05	O[A]
Loading/Unloading Operations	VOC HAP	0.22 0.01	0.96 0.02	0.22 0.01	0.96 0.02	O[B]
Equipment Leaks	VOC CO_2e HAP	Does not apply	5.59 1,218 0.05	Does not apply	5.59 1,218 0.05	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, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. DO NOT LIST H_2, H_2O, N_2, O_2, 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).

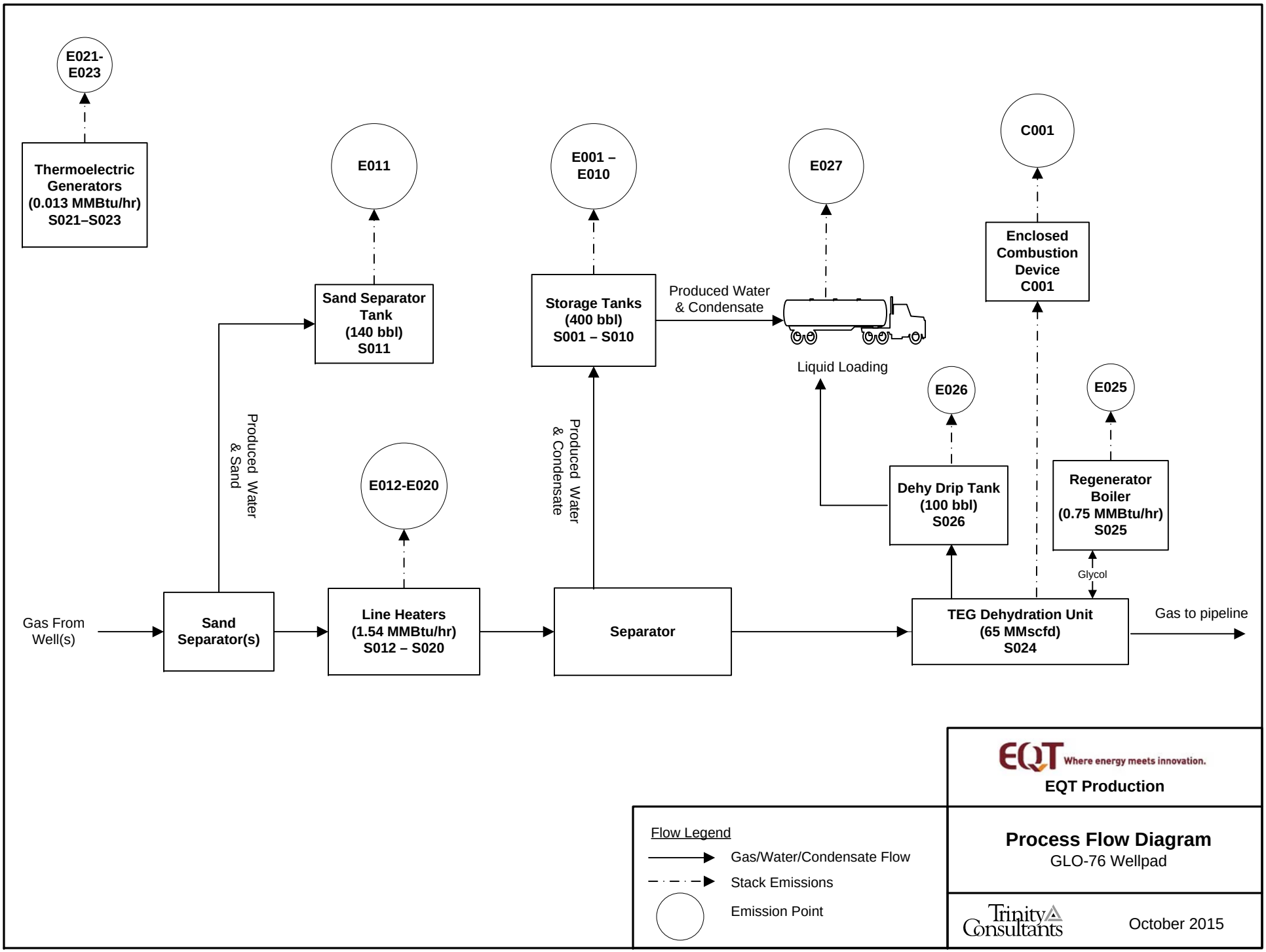
LEAK SOURCE DATA SHEET

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	485	TBD	TBD	2,616
	Light Liquid VOC	---	TBD	TBD	---
	Heavy Liquid VOC	---	TBD	TBD	---
	Non-VOC	---	TBD	TBD	---
Safety Relief Valves	Gas VOC	51	TBD	TBD	4,792
	Non VOC	---	TBD	TBD	---
Open-ended Lines	VOC	25	TBD	TBD	38
	Non-VOC	---	TBD	TBD	---
Sampling Connections	VOC	---	TBD	TBD	---
	Non-VOC	---	TBD	TBD	---
Compressors	VOC	---	TBD	TBD	---
	Non-VOC	---	TBD	TBD	---
Flanges	VOC	2,028	TBD	TBD	3,353
	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). SOCMI factors were used as it was representative of natural gas liquids extraction

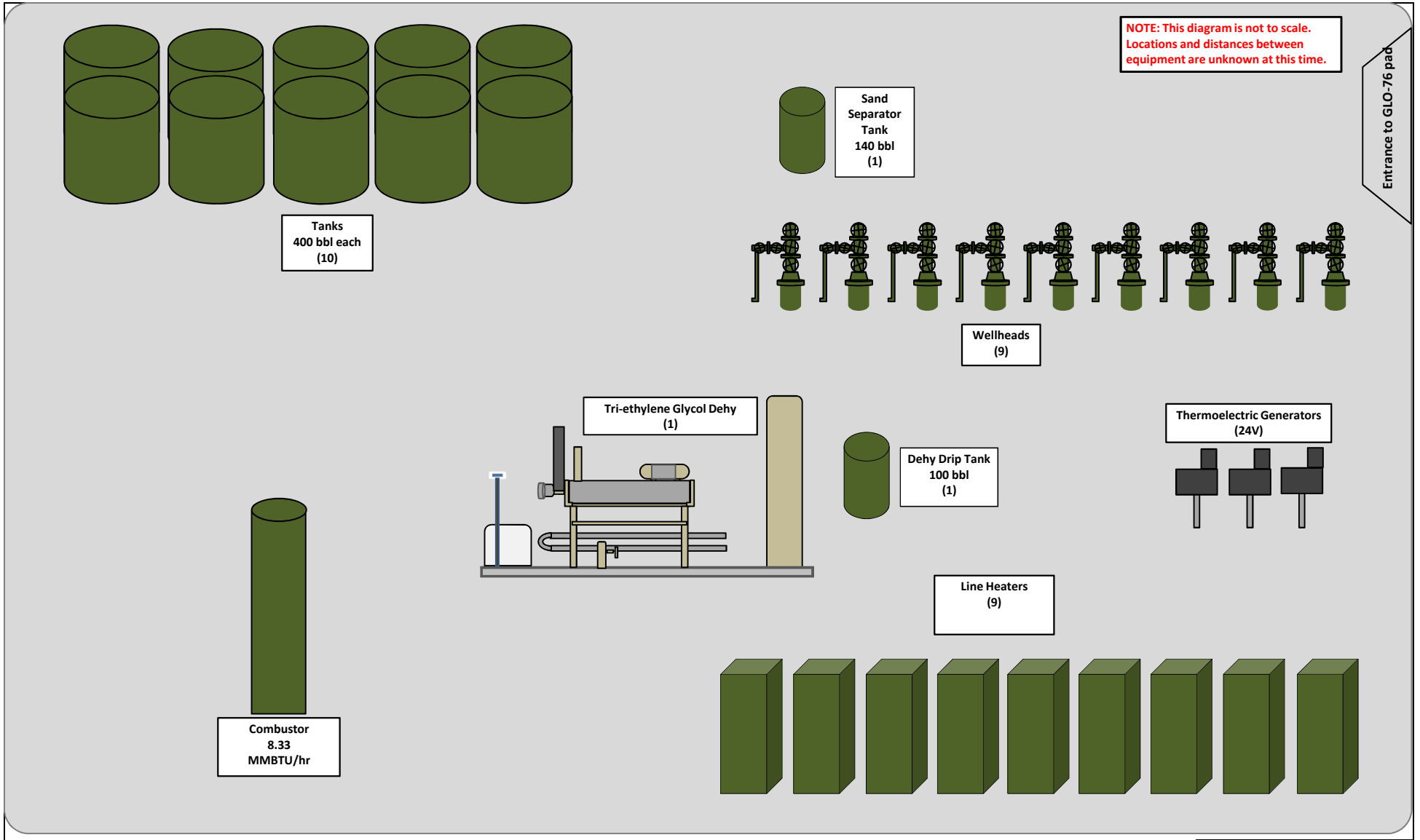
ATTACHMENT D

Process Flow Diagram


E021-E023
Thermoelectric Generators (0.013 MMBtu/hr) S021–S023
E011
Sand Separator Tank (140 bbl) S011
E001 – E010
Storage Tanks (400 bbl) S001 – S010
Produced Water & Condensate
E027
C001
Enclosed Combustion Device C001
Liquid Loading
E026
E025
Dehy Drip Tank (100 bbl) S026
Regenerator Boiler (0.75 MMBtu/hr) S025
Glycol
Produced Water & Sand
E012-E020
Produced Water & Condensate
Gas From Well(s)
Sand Separator(s)
Line Heaters (1.54 MMBtu/hr) S012 – S020
Separator
TEG Dehydration Unit (65 MMscfd) S024
Gas to pipeline
Flow Legend
Gas/Water/Condensate Flow
Stack Emissions
Emission Point
EQT Where energy meets innovation.
EQT Production
Process Flow Diagram
GLO-76 Wellpad
Trinity Consultants
October 2015

ATTACHMENT E

Plot Plan



ATTACHMENT E

GLO-76 Well Pad Plot Plan

ATTACHMENT F

Area Map

ATTACHMENT F: AREA MAP

Figure 1 - Map of GLO-76 Location

UTM Northing (KM):	4,379.489
UTM Easting (KM):	543.845
Elevation:	~1,450 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	☒
Section 6	Storage Vessels*	☒
Section 7	Gas Producing Units, In-Line Heaters, Heater Treaters, and Glycol Dehydration Reboilers	☒
Section 8	Pneumatic Controllers Affected Facility (NSPS, Subpart OOOO)	☐
Section 9	*Reserved*	☐
Section 10	Natural gas-fired Compressor Engine(s) (RICE) **	☐
Section 11	Tank Truck Loading Facility ***	☒
Section 12	Standards of Performance for Storage Vessel Affected Facilities (NSPS, Subpart OOOO)	☐
Section 13	Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (NSPS, Subpart JJJJ)	☐
Section 14	Control Devices not subject to NSPS, Subpart OOOO	☒
Section 15	National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (40CFR63, Subpart ZZZZ)	☐
Section 16	Glycol Dehydration Units	☒
Section 17	Dehydration Units With Exemption from NESHAP Standard, Subpart HH § 63.764(d) (40CFR63, Subpart HH)	☒
Section 18	Dehydration Units Subject to NESHAP Standard, Subpart HH and Not Located Within an UA/UC (40CFR63, Subpart HH)	☐
Section 19	Dehydration Units Subject to NESHAP Standard, Subpart HH and Located Within an UA/UC (40CFR63, Subpart HH)	☐

***** *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]
S001	E001	Produced Fluid Storage Tank	2015	400 bbl	New	None
S002	E002	Produced Fluid Storage Tank	2015	400 bbl	New	None
S003	E003	Produced Fluid Storage Tank	2015	400 bbl	New	None
S004	E004	Produced Fluid Storage Tank	2015	400 bbl	New	None
S005	E005	Produced Fluid Storage Tank	2015	400 bbl	New	None
S006	E006	Produced Fluid Storage Tank	2015	400 bbl	New	None
S007	E007	Produced Fluid Storage Tank	2015	400 bbl	New	None
S008	E008	Produced Fluid Storage Tank	2015	400 bbl	New	None
S009	E009	Produced Fluid Storage Tank	2015	400 bbl	New	None
S010	E010	Produced Fluid Storage Tank	2015	400 bbl	New	None
S011	E011	Sand Separator Tank	2015	140 bbl	New	None
S012	E012	Line Heater	2015	1.54 MMBtu/hr	New	None
S013	E013	Line Heater	2015	1.54 MMBtu/hr	New	None
S014	E014	Line Heater	2015	1.54 MMBtu/hr	New	None
S015	E015	Line Heater	2015	1.54 MMBtu/hr	New	None
S016	E016	Line Heater	2015	1.54 MMBtu/hr	New	None
S017	E017	Line Heater	2015	1.54 MMBtu/hr	New	None
S018	E018	Line Heater	2015	1.54 MMBtu/hr	New	None
S019	E019	Line Heater	2015	1.54 MMBtu/hr	New	None
S020	E020	Line Heater	2015	1.54 MMBtu/hr	New	None
S021	E021	Thermoelectric Generator	2015	0.013 MMBtu/hr	New	None
S022	E022	Thermoelectric Generator	2015	0.013 MMBtu/hr	New	None

S023	E023	Thermoelectric Generator	2015	0.013 MMBtu/hr	New	None
S024	C001	Dehydration Unit	2015	65 MMSCFD	New	C001
S025	E025	Reboiler	2015	0.75 MMBtu/hr	New	None
S026	E026	Dehy Drip Tank	2015	100 bbl	New	None
S027	E027	Liquid Loading	2015	9,972,333 Gal	New	None
C001	C001	Combustor	2015	8.33 MMBTU/hr	New	NA

[1] For Emission Units (or Sources) use the following numbering system:1S, 2S, 3S,... or other appropriate designation.
[2] For Emission Points use the following numbering system:1E, 2E, 3E, ... or other appropriate designation.
[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:	
47-049-02346	TBD
47-049-02347	TBD
TBD	
TBD	
TBD	
TBD	
TBD	

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 GLO-76 Wellpad	2. Tank Name Produced Fluid Storage Tanks
3. Emission Unit ID number S001 – S010	4. Emission Point ID number E001 – E010
5. Date Installed or Modified *(for existing tanks)* TBD	6. Type of change: ☒ New construction ☐ New stored material ☐ Other
7A. Description of Tank Modification *(if applicable)* NA	
7B. Will more than one material be stored in this tank? *If so, a separate form must be completed for each material.* ☐ Yes ☒ No	
7C. Provide any limitations on source operation affecting emissions. (production variation, etc.) None	

II. TANK INFORMATION (required)

8. Design Capacity *(specify barrels or gallons).* Use the internal cross-sectional area multiplied by internal height. 400 bbl	
9A. Tank Internal Diameter (ft.) ~12	9B. Tank Internal Height (ft.) ~20
10A. Maximum Liquid Height (ft.) ~20	10B. Average Liquid Height (ft.) ~10
11A. Maximum Vapor Space Height (ft.) ~20	11B. Average Vapor Space Height (ft.) ~10
12. Nominal Capacity *(specify barrels or gallons).* This is also known as "working volume. 400 bbl	
13A. Maximum annual throughput (gal/yr) ~9,831,213 (All tanks: S001-S010, S026)	13B. Maximum daily throughput (gal/day) ~26,935 (All tanks: S001-S010, S026)
14. Number of tank turnovers per year ~586 All tanks)	15. Maximum tank fill rate (gal/min) TBD
16. Tank fill method ☐ Submerged ☒ Splash ☐ Bottom Loading	
17. Is the tank system a variable vapor space system? ☐ Yes ☒ No If yes, (A) What is the volume expansion capacity of the system (gal)? (B) What are the number of transfers into the system per year?	
18. Type of tank (check all that apply): ☒ Fixed Roof _X__ vertical ___ horizontal ___ flat roof _X_ cone roof ___ dome roof ___ other (describe) ☐ External Floating Roof ___ pontoon roof ___ double deck roof ☐ Domed External (or Covered) Floating Roof ☐ Internal Floating Roof ___ vertical column support ___ self-supporting ☐ Variable Vapor Space ___ lifter roof ___ diaphragm ☐ Pressurized ___ spherical ___ cylindrical ☐ Underground ☐ Other (describe)	

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

☐ Refer to enclosed TANKS Summary Sheets
☒ Refer to the responses to items 19 – 26 in section VII

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

☐ Refer to enclosed TANKS Summary Sheets
☒ Refer to the responses to items 27 – 33 in section VII

V. LIQUID INFORMATION *(check which one applies)*

☐ Refer to enclosed TANKS Summary Sheets
☒ Refer to the responses to items 34 – 39 in section VII

VI. EMISSIONS AND CONTROL DEVICE DATA (required)

40. Emission Control Devices (check as many as apply):

☒ Does Not Apply
☐ Carbon Adsorption[1]
☐ Vent to Vapor Combustion Device[1] (vapor combustors, flares, thermal oxidizers)
☐ Condenser[1]
☐ Other[1] (describe)
☐ Rupture Disc (psig)
☐ Inert Gas Blanket of _____
☒ Conservation Vent (psig) – Enardo Valve
Vacuum Setting Pressure Setting
☒ Emergency Relief Valve (psig)

[1] Complete appropriate Air Pollution Control Device Sheet

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

Material Name and CAS No.	Flashing Loss		Breathing Loss		Working Loss		Total Emissions Loss		Estimation Method[1]
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	
See Attached Emission Calculations									

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

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

SECTION VII (required if did not provide TANKS Summary Sheets)

TANK CONSTRUCTION AND OPERATION INFORMATION

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

20A. Shell Color: Gray	20B. Roof Color: Gray	20C. Year Last Painted: New

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

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

23. Operating Pressure Range (psig): -0.03 to 0.70 psig

24. Is the tank a **Vertical Fixed Roof Tank**? ☒ Yes ☐ No	24A. If yes, for dome roof provide radius (ft):	24B. If yes, for cone roof, provide slop (ft/ft): 0.06

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

25A. Year Internal Floaters Installed:

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

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

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

25E. Is the floating roof equipped with a weather shield? ☐ Yes ☐ No			
25F. Describe deck fittings:			
26. Complete the following section for **Internal Floating Roof Tanks** ☒ Does not apply			
26A. Deck Type: ☐ Bolted ☐ Welded		26B. For bolted decks, provide deck construction:	
26C. Deck seam. Continuous sheet construction: ☐ 5 ft. wide ☐ 6 ft. wide ☐ 7 ft. wide ☐ 5 x 7.5 ft. wide ☐ 5 x 12 ft. wide ☐ other (describe)			
26D. Deck seam length (ft.):	26E. Area of deck (ft^2):	26F. For column supported tanks, # of columns:	26G. For column supported tanks, diameter of column:
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): 0.1638	
37A. Avg. liquid surface temperature (°F): 55.41		37B. Corresponding vapor pressure (psia): 0.2195	
38A. Maximum liquid surface temperature (°F): 64.27		38B. Corresponding vapor pressure (psia): 0.2912	
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):	18.7659		
39F. Maximum true vapor pressure (psia):	TBD		
39G. Maxim Reid vapor pressure (psia):	TBD		
39H. Months Storage per year. From: To:	12 (All year)		

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 GLO-76 Wellpad	2. Tank Name Sand Separator Tank
3. Emission Unit ID number S011	4. Emission Point ID number E011
5. Date Installed or Modified *(for existing tanks)* TBD	6. Type of change: ☒ New construction ☐ New stored material ☐ Other
7A. Description of Tank Modification *(if applicable)*	
7B. Will more than one material be stored in this tank? *If so, a separate form must be completed for each material.* ☐ Yes ☒ No	
7C. Provide any limitations on source operation affecting emissions. (production variation, etc.) None	

II. TANK INFORMATION (required)

8. Design Capacity *(specify barrels or gallons).* Use the internal cross-sectional area multiplied by internal height. 140 bbl	
9A. Tank Internal Diameter (ft.) ~10	9B. Tank Internal Height (ft.) ~10
10A. Maximum Liquid Height (ft.) ~10	10B. Average Liquid Height (ft.) ~5
11A. Maximum Vapor Space Height (ft.) ~10	11B. Average Vapor Space Height (ft.) ~5
12. Nominal Capacity *(specify barrels or gallons).* This is also known as "working volume. 140 bbl	
13A. Maximum annual throughput (gal/yr) ~141,120	13B. Maximum daily throughput (gal/day) ~387
14. Number of tank turnovers per year ~24 per tank	15. Maximum tank fill rate (gal/min) TBD
16. Tank fill method ☐ Submerged ☒ Splash ☐ Bottom Loading	
17. Is the tank system a variable vapor space system? ☐ Yes ☒ No If yes, (A) What is the volume expansion capacity of the system (gal)? (B) What are the number of transfers into the system per year?	
18. Type of tank (check all that apply): ☒ Fixed Roof ___ vertical _X__ horizontal ___ flat roof ___ cone roof ___ dome roof ___ other (describe) ☐ External Floating Roof ___ pontoon roof ___ double deck roof ☐ Domed External (or Covered) Floating Roof ☐ Internal Floating Roof ___ vertical column support ___ self-supporting ☐ Variable Vapor Space ___ lifter roof ___ diaphragm ☐ Pressurized ___ spherical ___ cylindrical ☐ Underground ☐ Other (describe)	

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

☐ Refer to enclosed TANKS Summary Sheets
☒ Refer to the responses to items 19 – 26 in section VII

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

☐ Refer to enclosed TANKS Summary Sheets
☒ Refer to the responses to items 27 – 33 in section VII

V. LIQUID INFORMATION *(check which one applies)*

☐ Refer to enclosed TANKS Summary Sheets
☒ Refer to the responses to items 34 – 39 in section VII

VI. EMISSIONS AND CONTROL DEVICE DATA (required)

40. Emission Control Devices (check as many as apply):

☒ Does Not Apply
☐ Carbon Adsorption[1]
☐ Vent to Vapor Combustion Device[1] (vapor combustors, flares, thermal oxidizers)
☐ Condenser[1]
☐ Other[1] (describe)
☐ Rupture Disc (psig)
☐ Inert Gas Blanket of _____
☐ Conservation Vent (psig)
Vacuum Setting Pressure Setting
☐ Emergency Relief Valve (psig)

[1] Complete appropriate Air Pollution Control Device Sheet

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

Material Name and CAS No.	Flashing Loss		Breathing Loss		Working Loss		Total Emissions Loss		Estimation Method[1]
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	
See Attached Emission Calculations									

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

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

SECTION VII (required if did not provide TANKS Summary Sheets)

TANK CONSTRUCTION AND OPERATION INFORMATION

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

20A. Shell Color: Gray	20B. Roof Color: Gray	20C. Year Last Painted: New

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

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

23. Operating Pressure Range (psig): -0.03 to 0.70 psig

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

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

25A. Year Internal Floaters Installed:

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

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

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

25E. Is the floating roof equipped with a weather shield? ☐ Yes ☐ No			
25F. Describe deck fittings:			
26. Complete the following section for **Internal Floating Roof Tanks** ☒ Does not apply			
26A. Deck Type: ☐ Bolted ☐ Welded		26B. For bolted decks, provide deck construction:	
26C. Deck seam. Continuous sheet construction: ☐ 5 ft. wide ☐ 6 ft. wide ☐ 7 ft. wide ☐ 5 x 7.5 ft. wide ☐ 5 x 12 ft. wide ☐ other (describe)			
26D. Deck seam length (ft.):	26E. Area of deck (ft^2):	26F. For column supported tanks, # of columns:	26G. For column supported tanks, diameter of column:
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): 0.1638	
37A. Avg. liquid surface temperature (°F): 55.41		37B. Corresponding vapor pressure (psia): 0.2195	
38A. Maximum liquid surface temperature (°F): 64.27		38B. Corresponding vapor pressure (psia): 0.2912	
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):	18.7659		
39F. Maximum true vapor pressure (psia):	TBD		
39G. Maxim Reid vapor pressure (psia):	TBD		
39H. Months Storage per year. From: To:	12 (All year)		

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 GLO-76 Wellpad	2. Tank Name Dehy Drip Fluid Tank
3. Emission Unit ID number S026	4. Emission Point ID number E026
5. Date Installed or Modified *(for existing tanks)* TBD	6. Type of change: ☒ New construction ☐ New stored material ☐ Other
7A. Description of Tank Modification *(if applicable)* NA	
7B. Will more than one material be stored in this tank? *If so, a separate form must be completed for each material.* ☐ Yes ☒ No	
7C. Provide any limitations on source operation affecting emissions. (production variation, etc.) None	

II. TANK INFORMATION (required)

8. Design Capacity *(specify barrels or gallons).* Use the internal cross-sectional area multiplied by internal height. 100 bbl	
9A. Tank Internal Diameter (ft.) ~8	9B. Tank Internal Height (ft.) ~11
10A. Maximum Liquid Height (ft.) ~11	10B. Average Liquid Height (ft.) ~5.5
11A. Maximum Vapor Space Height (ft.) ~11	11B. Average Vapor Space Height (ft.) ~5.5
12. Nominal Capacity *(specify barrels or gallons).* This is also known as "working volume. 100 bbl	
13A. Maximum annual throughput (gal/yr) ~9,831,213 (All tanks: S001-S010, S026)	13B. Maximum daily throughput (gal/day) ~26,935 (All tanks: S001-S010, S026)
14. Number of tank turnovers per year ~586 (All tank)	15. Maximum tank fill rate (gal/min) TBD
16. Tank fill method ☐ Submerged ☒ Splash ☐ Bottom Loading	
17. Is the tank system a variable vapor space system? ☐ Yes ☒ No If yes, (A) What is the volume expansion capacity of the system (gal)? (B) What are the number of transfers into the system per year?	
18. Type of tank (check all that apply): ☒ Fixed Roof _X__ vertical ___ horizontal _X__ flat roof __ cone roof ___ dome roof ___ other (describe) ☐ External Floating Roof ___ pontoon roof ___ double deck roof ☐ Domed External (or Covered) Floating Roof ☐ Internal Floating Roof ___ vertical column support ___ self-supporting ☐ Variable Vapor Space ___ lifter roof ___ diaphragm ☐ Pressurized ___ spherical ___ cylindrical ☐ Underground ☐ Other (describe)	

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

☐ Refer to enclosed TANKS Summary Sheets
☒ Refer to the responses to items 19 – 26 in section VII

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

☐ Refer to enclosed TANKS Summary Sheets
☒ Refer to the responses to items 27 – 33 in section VII

V. LIQUID INFORMATION *(check which one applies)*

☐ Refer to enclosed TANKS Summary Sheets
☒ Refer to the responses to items 34 – 39 in section VII

VI. EMISSIONS AND CONTROL DEVICE DATA (required)

40. Emission Control Devices (check as many as apply):

☒ Does Not Apply
☐ Carbon Adsorption[1]
☐ Vent to Vapor Combustion Device[1] (vapor combustors, flares, thermal oxidizers)
☐ Condenser[1]
☐ Other[1] (describe)
☐ Rupture Disc (psig)
☐ Inert Gas Blanket of _____
☐ Conservation Vent (psig) – Enardo Valve
Vacuum Setting Pressure Setting
☐ Emergency Relief Valve (psig)

[1] Complete appropriate Air Pollution Control Device Sheet

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

Material Name and CAS No.	**Flashing Loss**		**Breathing Loss**		**Working Loss**		**Total Emissions Loss**		**Estimation Method[1]**
	lb/hr	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	
See Attached Emission Calculations									

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

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

SECTION VII (required if did not provide TANKS Summary Sheets)

TANK CONSTRUCTION AND OPERATION INFORMATION		
19. Tank Shell Construction: ☐ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☒ Other (describe) Welded		
20A. Shell Color: Gray	20B. Roof Color: Gray	20C. Year Last Painted: New
21. Shell Condition (if metal and unlined): ☒ No Rust ☐ Light Rust ☐ Dense Rust ☐ Not applicable		
22A. Is the tank heated? ☐ Yes ☒ No	22B. If yes, operating temperature:	22C. If yes, how is heat provided to tank?
23. Operating Pressure Range (psig): -0.03 to 0.70 psig		
24. Is the tank a **Vertical Fixed Roof Tank**? ☒ Yes ☐No	24A. If yes, for dome roof provide radius (ft): NA	24B. If yes, for cone roof, provide slop (ft/ft): NA
25. Complete item 25 for **Floating Roof Tanks** ☐ Does not apply ☒		
25A. Year Internal Floaters Installed:		
25B. Primary Seal Type *(check one):* ☐ Metallic (mechanical) shoe seal ☐ Liquid mounted resilient seal ☐ Vapor mounted resilient seal ☐ Other (describe):		
25C. Is the Floating Roof equipped with a secondary seal? ☐ Yes ☐No		
25D. If yes, how is the secondary seal mounted? *(check one)* ☐ Shoe ☐ Rim ☐ Other (describe):		

25E. Is the floating roof equipped with a weather shield? ☐ Yes ☐ No			
25F. Describe deck fittings:			
26. Complete the following section for **Internal Floating Roof Tanks** ☒ Does not apply			
26A. Deck Type: ☐ Bolted ☐ Welded		26B. For bolted decks, provide deck construction:	
26C. Deck seam. Continuous sheet construction: ☐ 5 ft. wide ☐ 6 ft. wide ☐ 7 ft. wide ☐ 5 x 7.5 ft. wide ☐ 5 x 12 ft. wide ☐ other (describe)			
26D. Deck seam length (ft.):	26E. Area of deck (ft^2):	26F. For column supported tanks, # of columns:	26G. For column supported tanks, diameter of column:
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): 0.1638	
37A. Avg. liquid surface temperature (°F): 55.41		37B. Corresponding vapor pressure (psia): 0.2195	
38A. Maximum liquid surface temperature (°F): 64.27		38B. Corresponding vapor pressure (psia): 0.2912	
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):	18.7659		
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]
S012	E012	Line Heater	2015	New	None	1.54	~1,102
S013	E013	Line Heater	2015	New	None	1.54	~1,102
S014	E014	Line Heater	2015	New	None	1.54	~1,102
S015	E015	Line Heater	2015	New	None	1.54	~1,102
S016	E016	Line Heater	2015	New	None	1.54	~1,102
S017	E017	Line Heater	2015	New	None	1.54	~1,102
S018	E018	Line Heater	2015	New	None	1.54	~1,102
S019	E019	Line Heater	2015	New	None	1.54	~1,102
S020	E020	Line Heater	2015	New	None	1.54	~1,102
S021	E021	Thermoelectric Generator	2015	New	None	0.013	~1,102
S022	E022	Thermoelectric Generator	2015	New	None	0.013	~1,102
S023	E023	Thermoelectric Generator	2015	New	None	0.013	~1,102

[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.

GLYCOL DEHYDRATION EMISSION UNIT DATA SHEET

General Glycol Dehydration Unit Data		Manufacturer and Model		Valerus (or similar)	
		Max Dry Gas Flow Rate (mmscf/day)		65	
		Design Heat Input (mmBtu/hr)		0.75	
		Design Type (DEG or TEG)		TEG	
		Source Status[2]		NS	
		Date Installed/Modified/Removed[3]		2015	
		Regenerator Still Vent APCD[4]		FL (Enclosed)	
		Control Device ID[4]		C001	
		Fuel HV (Btu/scf)		~1,102	
		H_2S Content (gr/100 scf)		0	
		Operation (hrs/yr)		8760	
Emission Unit ID/ Emission Point ID[1]	Vent	Reference[5]	Potential Emissions[6]	lbs/hr	tons/yr
S025 / E025	Reboiler Vent	AP	NO_X	0.07	0.30
		AP	CO	0.06	0.25
		AP	VOC	<0.01	0.02
		AP	SO_2	<0.01	<0.01
		AP	PM_{10}	0.01	0.02
S024 / C001	Glycol Regenerator Still Vent	GRI-GLYCalc™	VOC	0.85	3.75
		GRI-GLYCalc™	Benzene	0.02	0.08
		GRI-GLYCalc™	Ethylbenzene	0.05	0.20
		GRI-GLYCalc™	Toluene	0.06	0.26
		GRI-GLYCalc™	Xylenes	0.06	0.28
		GRI-GLYCalc™	n-Hexane	0.01	0.03

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

2. Enter the Source Status using the following codes:

NS	Construction of New Source	ES	Existing Source
MS	Modification of Existing Source	RS	Removal of Source

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

4. Enter the Air Pollution Control Device (APCD) type designation using the following codes and the control device ID number:

NA	None	CD	Condenser
FL	Flare	CC	Condenser/Combustion Combination
TO	Thermal Oxidizer		

5. Enter the Potential Emissions Data Reference designation using the following codes:

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

6. Enter the Reboiler Vent and Glycol Regenerator Still Vent Potential to Emit (PTE) for the listed regulated pollutants in lbs per hour and tons per year. The Glycol Regenerator Still Vent potential emissions may be determined using the most recent version of the thermodynamic software model GRI-GLYCalc™ (Radian International LLC & Gas Research Institute). Attach all referenced Potential Emissions Data (or calculations) and the GRI-GLYCalc *Aggregate Calculations Report* to this *Glycol Dehydration Emission Unit Data Sheet(s)*. This PTE data shall be incorporated in the *Emissions Summary Sheet*.

Include a copy of the GRI-GLYCalc™ analysis. This includes a printout of the aggregate calculations report, which shall include emissions reports, equipment reports, and stream reports.

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: S027	2. Emission Point ID: E027	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? ☐ Yes ☒ 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 *(add pages as necessary):*

Liquid Name	Produced Fluids		
Max. daily throughput (1000 gal/day)	Variable		
Max. annual throughput (gal/yr)	9,972,333		
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]	0.2912		
Cargo Vessel Condition[3]	Unknown		
Control Equipment or Method [4]	SP		
Minimum collection efficiency (%)	0		
Minimum control efficiency (%)	0		

** Continued on next page*

Maximum Emission Rate	Loading (lb/hr)	VOC: 0.22 HAP: 0.01		
	Annual (ton/yr)	VOC: 0.96 HAP: 0.02		
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 *Air Pollution Control Device Sheets as Attachment "H"*):
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 *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.* None	RECORDKEEPING *Please describe the proposed recordkeeping that will accompany the monitoring.* None
REPORTING *Please describe the proposed frequency of reporting of the recordkeeping.* None	TESTING *Please describe any proposed emissions testing for this process equipment/air pollution control device.* 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#: C001	2. Installation Date: 2015 ☒ New	
3. Maximum Rated Total Flow Capacity: ~93 scf/min ~134.56 Mscfd	4. Maximum Design Heat Input: 8.33 MMBtu/hr	5. Design Heat Content: 1,500 BTU/scf

Control Device Information

6. Select the type of vapor combustion control device being used: ☒ Enclosed Combustion Device

☐ Elevated Flare ☐ Ground Flare ☐ Thermal Oxidizer ☐ Completion Combustion Device

7. Manufacturer: LEED Fabrication Model No.: Enclosed Combustor 36”	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#: C001)

10. Emission Unit ID#	Emission Source Description:	Emission Unit ID#	Emission Source Description:
S024	Dehydration Unit		

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

11. Assist Type	12. Flare Height	13. Tip Diameter	14. Was the design per §60.18?
☐ Steam - ☐ Air - ☐ Pressure - ☒ Non -	~25 ft	~3 ft	☐Yes ☐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)
~93	Variable	~70	

19. Provide an attachment with the characteristics of the waste gas stream to be burned. ***See attached emission calculations.***

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	24	26,335	☐ Yes ☒ 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? ☒ Yes ☐ No	28. If yes, what type? ☒ Thermocouple ☐ Infra-Red ☐ Ultra Violet ☐ Camera with monitoring control room ☐ 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? ☒ **YES** ☐ **NO**

Please attach a copy of manufacturer's data sheet.
Please attach a copy of manufacturer's drawing.
Please attach a copy of the manufacturer's performance testing.

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

ATTACHMENT I

Emission Calculations

Company Name: EQT Production, LLC
Facility Name: GLO 76 Wellpad
Project Description: G70 Application

Site Wide Summary

Emission Source	Value	Units	Emission Unit ID(s)	Emission Point ID(s)	Control Device
Well(s)	9	per pad	---	---	---
Storage Tank(s) (400 bbl)	10	per pad	S001 - S010	E001 - E010	None
Sand Separator Tank	1	per pad	S011	E011	None
Line Heater(s) (1.54 MMBtu/hr)	9	per pad	S012 - S020	E012 - E020	None
Thermoelectric Generator(s) (TEGs)	3	per pad	S021 - S023	E021 - E023	None
Dehydrator(s)	1	per pad	S024	C001	C001
Reboiler(s)	1	per pad	S025	E025	---
Dehy Drip Tank	1	per pad	S026	E026	---
Tank Combustor(s)	0	per pad	---	---	---
Dehy Combustor(s)	1	per pad	C001	C001	N/A
Length of lease road	1,000	feet	---	---	---

Emission Point ID:	E001 - E010, E026	E011	C001	E025	E012 - E020	E021 - E023	---	E027	---	---
Constituent	**Produced Fluid Storage Tanks & Dehy Drip Tank (tpy)**	**Sand Separator Tank (tpy)**	**Dehydration Unit with Combustor (tpy)**	**Reboiler (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	<0.001	---	3.32	0.30	5.50	0.02	---	---	---	**9.14**
CO	<0.001	---	2.79	0.25	4.62	0.01	---	---	---	**7.68**
PM Total	<0.001	---	0.25	0.02	0.42	1.2E-03	---	---	2.08	**2.77**
PM_{10} Total	<0.001	---	0.25	0.02	0.42	1.2E-03	---	---	0.53	**1.22**
$PM_{2.5}$ Total	<0.001	---	0.25	0.02	0.42	1.2E-03	---	---	0.05	**0.75**
SO_2	<0.001	---	0.02	0.00	0.03	9.3E-05	---	---	---	**0.05**
VOC	2.00	0.02	3.93	0.02	0.30	8.5E-04	5.59	0.96	---	**12.82**
Greenhouse Gases										
CO_2	<0.001	---	4,289.25	384.34	7,095.44	19.92	0.25	---	---	**11,789**
CH_4	0.21	0.00	27.98	0.01	0.13	3.8E-04	48.71	---	---	**77.04**
N_2O	<0.001	---	0.01	0.00	0.01	3.8E-05	---	---	---	**0.02**
CO_2e	5.25	0.05	4,991.13	384.73	7,102.76	19.94	1,217.88	---	---	**13,722**
Hazardous Air Pollutants										
Methylnaphthalene (2-)	---	---	---	7.2E-08	1.3E-06	3.7E-09	---	---	---	1.4E-06
Methylchloranthrene (3-)	---	---	---	5.4E-09	9.9E-08	2.8E-10	---	---	---	1.0E-07
Dimethybenz(a)anthracene (7,12-)	---	---	---	4.8E-08	8.8E-07	2.5E-09	---	---	---	9.3E-07
Acenaphthene	---	---	---	5.4E-09	9.9E-08	2.8E-10	---	---	---	1.0E-07
Acenaphthylene	---	---	---	5.4E-09	9.9E-08	2.8E-10	---	---	---	1.0E-07
Anthracene	---	---	---	7.2E-09	1.3E-07	3.7E-10	---	---	---	1.4E-07
Benz(a)anthracene	---	---	---	5.4E-09	9.9E-08	2.8E-10	---	---	---	1.0E-07
Benzene	<0.001	<0.001	0.08	6.3E-06	1.2E-04	3.2E-07	<0.001	4.8E-04	---	7.8E-02
Benzo(a)pyrene	---	---	---	3.6E-09	6.6E-08	1.9E-10	---	---	---	7.0E-08
Benzo(b)fluoranthene	---	---	---	5.4E-09	9.9E-08	2.8E-10	---	---	---	1.0E-07
Benzo(g,h,i)perylene	---	---	---	3.6E-09	6.6E-08	1.9E-10	---	---	---	7.0E-08
Benzo(k)fluoranthene	---	---	---	5.4E-09	9.9E-08	2.8E-10	---	---	---	1.0E-07
Chrysene	---	---	---	5.4E-09	9.9E-08	2.8E-10	---	---	---	1.0E-07
Dibenzo(a,h)anthracene	---	---	---	3.6E-09	6.6E-08	1.9E-10	---	---	---	7.0E-08
Dichlorobenzene	---	---	---	3.6E-06	6.6E-05	1.9E-07	---	---	---	7.0E-05
Fluoranthene	---	---	---	8.9E-09	1.7E-07	4.6E-10	---	---	---	1.7E-07
Fluorene	---	---	---	8.3E-09	1.5E-07	4.3E-10	---	---	---	1.6E-07
Formaldehyde	---	---	---	2.2E-04	4.1E-03	1.2E-05	---	---	---	4.4E-03
Hexane, n-	<0.001	<0.001	0.03	5.4E-03	9.9E-02	2.8E-04	3.35E-02	2.0E-02	---	1.9E-01
Indeno(1,2,3-cd)pyrene	---	---	---	5.4E-09	9.9E-08	2.8E-10	---	---	---	1.0E-07
Naphthalene	---	---	---	1.8E-06	3.4E-05	9.4E-08	---	---	---	3.5E-05
Phenanthrene	---	---	---	5.1E-08	9.4E-07	2.6E-09	---	---	---	9.9E-07
Pyrene	---	---	---	1.5E-08	2.8E-07	7.7E-10	---	---	---	2.9E-07
Toluene	<0.001	<0.001	0.27	1.0E-05	1.9E-04	5.3E-07	5.97E-03	9.1E-04	---	2.7E-01
Arsenic	---	---	---	6.0E-07	1.1E-05	3.1E-08	---	---	---	1.2E-05
Beryllium	---	---	---	3.6E-08	6.6E-07	1.9E-09	---	---	---	7.0E-07
Cadmium	---	---	---	3.3E-06	6.1E-05	1.7E-07	---	---	---	6.4E-05
Chromium	---	---	---	4.2E-06	7.7E-05	2.2E-07	---	---	---	8.1E-05
Cobalt	---	---	---	2.5E-07	4.6E-06	1.3E-08	---	---	---	4.9E-06
Manganese	---	---	---	1.1E-06	2.1E-05	5.9E-08	---	---	---	2.2E-05
Mercury	---	---	---	7.8E-07	1.4E-05	4.0E-08	---	---	---	1.5E-05
Nickel	---	---	---	6.3E-06	1.2E-04	3.2E-07	---	---	---	1.2E-04
Selenium	---	---	---	7.2E-08	1.3E-06	3.7E-09	---	---	---	1.4E-06
Ethylbenzene	<0.001	<0.001	0.20	---	---	---	<0.001	5.1E-05	---	2.0E-01
Trimethylpentane (2,2,4-)	<0.001	<0.001	3.2E-03	---	---	---	1.48E-02	4.3E-05	---	1.8E-02
Xylene	<0.001	<0.001	0.28	---	---	---	<0.001	6.9E-04	---	2.8E-01
Total HAP	<0.001	<0.001	0.86	0.01	0.10	2.9E-04	0.05	0.02	---	**1.05**

Company Name: **EQT Production, LLC**
Facility Name: **GLO 76 Wellpad**
Project Description: **G70 Application**

Produced Fluid Storage Tanks and Dehy Drip Tank

Throughput Parameter	Value	Units
Operational Hours	8,760	hrs/yr
Total Produced Fluid Throughput for E&P [1]	1.00	bbl/day (per tank)
Total Condensate Throughput	0	bbl/month
Total Produced Water Throughput	19,506	bbl/month

Description	Potential Throughput [2, 3] (gal/yr)
Produced Water and Condensate	9,831,213

[1] This pad is not expected to produce condensate. 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 BIG-182 wellpad.

[3] Potential liquid throughput is representative of liquid produced from each well, and liquid accumulated in the dehydrator drip tank.

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

Constituent	Total Emissions [1] lb/hr	tpy
Methane	0.005	0.021
Ethane	0.007	0.031
Propane	0.015	0.065
Isobutane	0.009	0.039
n-Butane	0.016	0.068
Isopentane	0.003	0.011
n-Pentane	0.001	0.005
n-Hexane	<0.001	0.001
Cyclohexane	<0.001	<0.001
Other Hexanes	<0.001	0.002
Heptanes	0.001	0.004
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	0.001	0.004
Total Emissions:	0.058	0.253
Total VOC Emissions:	0.046	0.200
Total HAP Emissions:	<0.001	<0.001

[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 9/12/2014 condensate sample from BIG 192 wellpad (located within 5 miles of GLO-76 and best estimate for condensate composition as none is expected).

Company Name: EQT Production, LLC
Facility Name: GLO 76 Wellpad
Project Description: G70 Application

Produced Fluid Storage Tanks and Dehy Drip Tank

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

Constituent	Total Emissions lb/hr	Total Emissions tpy
Methane	0.005	0.021
Ethane	0.007	0.031
Propane	0.015	0.065
Isobutane	0.009	0.039
n-Butane	0.016	0.068
Isopentane	0.003	0.011
n-Pentane	0.001	0.005
n-Hexane	<0.001	0.001
Cyclohexane	<0.001	<0.001
Other Hexanes	<0.001	0.002
Heptanes	0.001	0.004
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	0.001	0.004
Total Emissions:	0.058	0.253
Total VOC Emissions:	0.046	0.200
Total HAP Emissions:	<0.001	<0.001

Company Name: **EQT Production, LLC**
Facility Name: **GLO 76 Wellpad**
Project Description: **G70 Application**

Sand Separator Tank

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

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

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

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

Constituent	Total Emissions [1] lb/hr	tpy
Methane	<0.001	0.002
Ethane	0.001	0.003
Propane	0.002	0.007
Isobutane	0.001	0.004
n-Butane	0.002	0.007
Isopentane	<0.001	0.001
n-Pentane	<0.001	0.001
n-Hexane	<0.001	<0.001
Cyclohexane	<0.001	<0.001
Other Hexanes	<0.001	<0.001
Heptanes	<0.001	<0.001
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	<0.001	<0.001
Total Emissions:	0.006	0.025
Total VOC Emissions:	0.005	0.020
Total HAP Emissions:	<0.001	<0.001

[1] E&P TANK 2.0 calculates working, breathing and flashing losses and reports the sum as one total.
[2] E&P TANK v2.0 emission calculations are based on 9/12/2014 condensate sample from BIG 192 wellpad.

Company Name: **EQT Production, LLC**
Facility Name: **GLO 76 Wellpad**
Project Description: **G70 Application**

Sand Separator Tank

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

Constituent	Total Emissions lb/hr	Total Emissions tpy
Methane	<0.001	0.002
Ethane	0.001	0.003
Propane	0.002	0.007
Isobutane	0.001	0.004
n-Butane	0.002	0.007
Isopentane	<0.001	0.001
n-Pentane	<0.001	0.001
n-Hexane	<0.001	<0.001
Cyclohexane	<0.001	<0.001
Other Hexanes	<0.001	<0.001
Heptanes	<0.001	<0.001
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	<0.001	<0.001
Total Emissions:	0.006	0.025
Total VOC Emissions:	0.005	0.020
Total HAP Emissions:	0.000	0.000

Company Name: **EQT Production, LLC**
Facility Name: **GLO 76 Wellpad**
Project Description: **G70 Application**

Line Heaters

Parameter	Value	Units
Fuel Used	Natural Gas	
Higher Heating Value (HHV)	1,102	BTU/scf
Heat Input	1.54	MMBtu/hr (each)
Fuel Consumption	1.40E-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]	Potential Emissions (tons/yr)[3]
NO_x	100	1.4E-01	6.1E-01
CO	84	1.2E-01	5.1E-01
SO_2	0.6	8.4E-04	3.7E-03
PM Total	7.6	1.1E-02	4.6E-02
PM Condensable	5.7	8.0E-03	3.5E-02
PM_{10} (Filterable)	1.9	2.7E-03	1.2E-02
$PM_{2.5}$ (Filterable)	1.9	2.7E-03	1.2E-02
VOC	5.5	7.7E-03	3.4E-02
Lead	5.0E-04	7.0E-07	3.1E-06
CO_2 (Natural Gas Firing)[4]	128,931	180	788
CH_4 (Natural Gas Firing)[4]	2.4	3.4E-03	1.5E-02
N_2O (Natural Gas Firing)[4]	0.24	3.4E-04	1.5E-03

Company Name: **EQT Production, LLC**
Facility Name: **GLO 76 Wellpad**
Project Description: **G70 Application**

Line Heaters

Hazardous Air Pollutant (HAP) Potential Emissions:

Pollutant	Emission Factor (lb/MMscf)[1]	Potential Emissions (lb/hr)[2]	Potential Emissions (tons/yr)[3]
HAPs:			
Methylnaphthalene (2-)	2.4E-05	3.4E-08	1.5E-07
3-Methylchloranthrene	1.8E-06	2.5E-09	1.1E-08
7,12-Dimethylbenz(a)anthracene	1.6E-05	2.2E-08	9.8E-08
Acenaphthene	1.8E-06	2.5E-09	1.1E-08
Acenaphthylene	1.8E-06	2.5E-09	1.1E-08
Anthracene	2.4E-06	3.4E-09	1.5E-08
Benz(a)anthracene	1.8E-06	2.5E-09	1.1E-08
Benzene	2.1E-03	2.9E-06	1.3E-05
Benzo(a)pyrene	1.2E-06	1.7E-09	7.3E-09
Benzo(b)fluoranthene	1.8E-06	2.5E-09	1.1E-08
Benzo(g,h,i)perylene	1.2E-06	1.7E-09	7.3E-09
Benzo(k)fluoranthene	1.8E-06	2.5E-09	1.1E-08
Chrysene	1.8E-06	2.5E-09	1.1E-08
Dibenzo(a,h) anthracene	1.2E-06	1.7E-09	7.3E-09
Dichlorobenzene	1.2E-03	1.7E-06	7.3E-06
Fluoranthene	3.0E-06	4.2E-09	1.8E-08
Fluorene	2.8E-06	3.9E-09	1.7E-08
Formaldehyde	7.5E-02	1.0E-04	4.6E-04
Hexane	1.8E+00	2.5E-03	1.1E-02
Indo(1,2,3-cd)pyrene	1.8E-06	2.5E-09	1.1E-08
Naphthalene	6.1E-04	8.5E-07	3.7E-06
Phenanthrene	1.7E-05	2.4E-08	1.0E-07
Pyrene	5.0E-06	7.0E-09	3.1E-08
Toluene	3.4E-03	4.7E-06	2.1E-05
Arsenic	2.0E-04	2.8E-07	1.2E-06
Beryllium	1.2E-05	1.7E-08	7.3E-08
Cadmium	1.1E-03	1.5E-06	6.7E-06
Chromium	1.4E-03	2.0E-06	8.6E-06
Cobalt	8.4E-05	1.2E-07	5.1E-07
Manganese	3.8E-04	5.3E-07	2.3E-06
Mercury	2.6E-04	3.6E-07	1.6E-06
Nickel	2.1E-03	2.9E-06	1.3E-05
Selenium	2.4E-05	3.4E-08	1.5E-07
Total HAP		**2.6E-03**	**1.2E-02**

[1] Emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, 1.4-3, & 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: **GLO 76 Wellpad**
Project Description: **G70 Application**

Thermoelectric Generators (TEGs)

Parameter	Value	Units
Manufacturer	Global Thermoelectric	
Fuel Used	Natural Gas	
Higher Heating Value (HHV)	1,102	BTU/scf
Heat Input	0.013	MMBtu/hr (each)
Fuel Consumption [1]	1.18E-05	MMscf/hr (each)
Potential Annual Hours of Operation	8,760	hr/yr

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

Criteria and Manufacturer Specific Pollutant Emission Rates:

Pollutant	Emission Factor (lb/MMscf)[1]	Potential Emissions (lb/hr)[2]	Potential Emissions (tons/yr)[3]
NO_x	100	1.2E-03	5.2E-03
CO	84	9.9E-04	4.3E-03
SO_2	0.6	7.1E-06	3.1E-05
PM Total	7.6	8.9E-05	3.9E-04
PM Condensable	5.7	6.7E-05	2.9E-04
PM_{10} (Filterable)	1.9	2.2E-05	9.8E-05
$PM_{2.5}$ (Filterable)	1.9	2.2E-05	9.8E-05
VOC	5.5	6.5E-05	2.8E-04
Lead	5.00E-04	5.9E-09	2.6E-08
CO_2 (Natural Gas Firing)[4]	128,931	2	7
CH_4 (Natural Gas Firing)[4]	2.4	2.9E-05	1.3E-04
N_2O (Natural Gas Firing)[4]	0.24	2.9E-06	1.3E-05

Company Name: **EQT Production, LLC**
Facility Name: **GLO 76 Wellpad**
Project Description: **G70 Application**

Thermoelectric Generators (TEGs)

Hazardous Air Pollutant (HAP) Potential Emissions:

Pollutant	Emission Factor (lb/MMscf)[1]	Potential Emissions (lb/hr)[2]	Potential Emissions (tons/yr)[3]
HAPs:			
Methylnaphthalene (2-)	2.4E-05	2.8E-10	1.2E-09
3-Methylchloranthrene	1.8E-06	2.1E-11	9.3E-11
7,12-Dimethylbenz(a)anthracene	1.6E-05	1.9E-10	8.2E-10
Acenaphthene	1.8E-06	2.1E-11	9.3E-11
Acenaphthylene	1.8E-06	2.1E-11	9.3E-11
Anthracene	2.4E-06	2.8E-11	1.2E-10
Benz(a)anthracene	1.8E-06	2.1E-11	9.3E-11
Benzene	2.1E-03	2.5E-08	1.1E-07
Benzo(a)pyrene	1.2E-06	1.4E-11	6.2E-11
Benzo(b)fluoranthene	1.8E-06	2.1E-11	9.3E-11
Benzo(g,h,i)perylene	1.2E-06	1.4E-11	6.2E-11
Benzo(k)fluoranthene	1.8E-06	2.1E-11	9.3E-11
Chrysene	1.8E-06	2.1E-11	9.3E-11
Dibenzo(a,h) anthracene	1.2E-06	1.4E-11	6.2E-11
Dichlorobenzene	1.2E-03	1.4E-08	6.2E-08
Fluoranthene	3.0E-06	3.5E-11	1.5E-10
Fluorene	2.8E-06	3.3E-11	1.4E-10
Formaldehyde	7.5E-02	8.8E-07	3.9E-06
Hexane	1.8E+00	2.1E-05	9.3E-05
Indo(1,2,3-cd)pyrene	1.8E-06	2.1E-11	9.3E-11
Naphthalene	6.1E-04	7.2E-09	3.1E-08
Phenanthrene	1.7E-05	2.0E-10	8.8E-10
Pyrene	5.0E-06	5.9E-11	2.6E-10
Toluene	3.4E-03	4.0E-08	1.8E-07
Arsenic	2.0E-04	2.4E-09	1.0E-08
Beryllium	1.2E-05	1.4E-10	6.2E-10
Cadmium	1.1E-03	1.3E-08	5.7E-08
Chromium	1.4E-03	1.6E-08	7.2E-08
Cobalt	8.4E-05	9.9E-10	4.3E-09
Manganese	3.8E-04	4.5E-09	2.0E-08
Mercury	2.6E-04	3.1E-09	1.3E-08
Nickel	2.1E-03	2.5E-08	1.1E-07
Selenium	2.4E-05	2.8E-10	1.2E-09
Total HAP		**2.2E-05**	**9.7E-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 $(tons/yr)_{Potential} = (lb/hr)_{Emissions} \times$ (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: **GLO 76 Wellpad**
Project Description: **G70 Application**

Triethylene Glycol Dehydrator

GRI-GLYCalc Version 4.0 - EMISSIONS SUMMARY[1]

Uncontrolled Regenerator Emissions

Pollutant	(lbs/hr)	(lbs/day)	(tons/yr)
Carbon Dioxide	0.22	5.30	0.97
Methane	1.1264	27.0340	4.9336
Ethane	0.9511	22.8260	4.1658
Propane	0.6191	14.8590	2.7118
Isobutane	0.1933	4.6390	0.8465
n-Butane	0.3154	7.5700	1.3815
Isopentane	0.1261	3.0270	0.5525
n-Pentane	0.0876	2.1010	0.3835
Cyclopentane	0.0216	0.5190	0.0948
n-Hexane*	0.0584	1.4020	0.2558
Cyclohexane	0.0521	1.2500	0.2281
Other Hexanes	0.1347	3.2340	0.5902
Heptanes	0.2286	5.4870	1.0014
Methylcyclohexane	0.0708	1.7000	0.3103
2,2,4-Trimethylpentane*	0.0056	0.1340	0.0245
Benzene*	0.2478	5.9460	1.0852
Toluene*	0.8560	20.5430	3.7491
Ethylbenzene*	0.6544	15.7050	2.8661
Xylenes*	0.9003	21.6080	3.9434
C8 + Heavier Hydrocarbons	0.3203	7.6870	1.4029
Total Emissions	6.9696	167.2710	30.5270
Total Hydrocarbon Emissions	6.9696	167.271	30.5270
Total VOC Emissions	4.8921	117.412	21.4276
Total HAP Emissions	2.7224	65.338	11.9241

GRI-GLYCalc Version 4.0 - EMISSIONS SUMMARY[1]

Uncontrolled Flash Gas Emissions

Pollutant	(lbs/hr)	(lbs/day)	(tons/yr)
Carbon Dioxide	0.96	23.09	4.21
Methane	89.8666	2156.7980	393.6156
Ethane	18.3011	439.2260	80.1588
Propane	4.6333	111.2000	20.2940
Isobutane	0.8396	20.1520	3.6777
n-Butane	0.9808	23.5400	4.2960
Isopentane	0.3135	7.5240	1.3730
n-Pentane	0.1642	3.9420	0.7194
Cyclopentane	0.0107	0.2570	0.0470
n-Hexane*	0.0528	1.2670	0.2312
Cyclohexane	0.0120	0.2880	0.0526
Other Hexanes	0.1700	4.0810	0.7447
Heptanes	0.0878	2.1070	0.3845
Methylcyclohexane	0.0114	0.2730	0.0498
2,2,4-Trimethylpentane*	0.0047	0.1130	0.0206
Benzene*	0.0056	0.1340	0.0245
Toluene*	0.0109	0.2600	0.0475
Ethylbenzene*	0.0042	0.1020	0.0185
Xylenes*	0.0038	0.0900	0.0165
C8 + Heavier Hydrocarbons	0.0187	0.4480	0.0817
Total Emissions	115.4917	2771.8010	505.8537
Total Hydrocarbon Emissions	115.4917	2771.8010	505.8537
Total VOC Emissions	7.3240	175.7770	32.0793
Total HAP Emissions	0.0819	1.9670	0.3589

GRI-GLYCalc Version 4.0 - EMISSIONS SUMMARY[1]

Controlled Combined Regenerator and Flash Tank Off Gas Emissions

Pollutant	(lbs/hr)	(lbs/day)	(tons/yr)
Carbon Dioxide	307	28.39	5.18
Methane	6.3695	152.8680	27.8984
Ethane	1.3477	32.3440	5.9027
Propane	0.3677	8.8240	1.6104
Isobutane	0.0723	1.7350	0.3167
n-Butane	0.0907	2.1780	0.3974
Isopentane	0.0308	0.7390	0.1348
n-Pentane	0.0176	0.4230	0.0772
Cyclopentane	0.0023	0.0540	0.0099
n-Hexane*	0.0078	0.1870	0.0341
Cyclohexane	0.0045	0.1080	0.0197
Other Hexanes	0.0213	0.5120	0.0934
Heptanes	0.0221	0.5320	0.0970
Methylcyclohexane	0.0058	0.1380	0.0252
2,2,4-Trimethylpentane*	0.0007	0.0170	0.0032
Benzene*	0.0177	0.4260	0.0777
Toluene*	0.0607	1.4560	0.2658
Ethylbenzene*	0.0461	1.1060	0.2019
Xylenes*	0.0633	1.5190	0.2772
C8 + Heavier Hydrocarbons	0.0237	0.5690	0.1039
Total Emissions	8.5723	205.7350	37.5466
Total Hydrocarbon Emissions	8.5723	205.7350	37.5466
Total VOC Emissions	0.8551	20.5230	3.7455
Total HAP Emissions	0.1963	4.7110	0.8598

Enclosed Combustor Emissions

Pollutant	Emission Factors (lb/MMBtu)	Combustor Potential Emissions (lb/hr)	Combustor Potential Emissions (tpy)	Pilot Potential Emissions (lb/hr)	Pilot Potential Emissions (tpy)
NO_x	9.1E-02	0.76	3.31	<0.01	0.01
CO	7.6E-02	0.63	2.78	<0.01	0.01
PM/PM_{10}	6.9E-03	0.06	0.25	<0.01	<0.01
SO_2	5.4E-04	<0.01	0.02	<0.01	<0.01
VOC	5.0E-03	0.04	0.18	<0.01	<0.01
CO_2 (Natural Gas Firing)	116.997	974.59	4268.69	3.51	15.37
CH_4 (Natural Gas Firing)	2.2E-03	0.02	0.08	<0.01	<0.01
N_2O (Natural Gas Firing)	2.2E-04	<0.01	0.01	<0.01	<0.01

Emission factors for criteria pollutants are from AP-42 Section 1.4. Emission factors for GHG's are from Tables C-1 and C-2, 40 CFR 98, Subpart C.

Combustor Specifications:

Combustor Rating	8.33 MMBtu/hr	Maximum rating for LEED 36" enclosed combustor.
Pilot Rating	0.03 MMBtu/hr	
Capture Efficiency:	95 %	
Destruction Efficiency:	98 %	
Total Control Efficiency:	93 %	

* HAPs

[1] Based on GRI GlyCalc 4.0 run at dry gas flowrate of 65 MMscf/day, tower temperatire of 90 °F and tower pressure of 800 psig. The flash tank operating parameters are 75 °F and 70 psig. Emissions from both the flash tank and regenerator are routed to the combustor with 93% total control efficiency (95% capture, 98% destruction).

[2] All constituents that were below the detection limit were conservatively represented in the GLYCalc run as half of the detection limit.

Company Name: **EQT Production, LLC**
Facility Name: **GLO 76 Wellpad**
Project Description: **G70 Application**

Reboiler

Parameter	Value	Units
Fuel Used	Natural Gas	
Higher Heating Value (HHV)	1,102	BTU/scf
Heat Input	0.75	MMBtu/hr
Fuel Consumption	6.81E-04	MMscf/hr
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]	Potential Emissions (tons/yr)[3]
NO_x	100	6.8E-02	3.0E-01
CO	84	5.7E-02	2.5E-01
SO_2	0.6	4.1E-04	1.8E-03
PM Total	7.6	5.2E-03	2.3E-02
PM Condensable	5.7	3.9E-03	1.7E-02
PM_{10} (Filterable)	1.9	1.3E-03	5.7E-03
$PM_{2.5}$ (Filterable)	1.9	1.3E-03	5.7E-03
VOC	5.5	3.7E-03	1.6E-02
Lead	5.00E-04	3.4E-07	1.5E-06
CO_2 (Natural Gas Firing)[4]	128,931	88	384
CH_4 (Natural Gas Firing)[4]	2.4	1.7E-03	7.2E-03
N_2O (Natural Gas Firing)[4]	0.24	1.7E-04	7.2E-04

Company Name: EQT Production, LLC
Facility Name: GLO 76 Wellpad
Project Description: G70 Application

Reboiler

Hazardous Air Pollutant (HAP) Potential Emissions:

Pollutant	Emission Factor (lb/MMscf)[1]	Potential Emissions (lb/hr)[2]	Potential Emissions (tons/yr)[3]
HAPs:			
Methylnaphthalene (2-)	2.4E-05	1.6E-08	7.2E-08
3-Methylchloranthrene	1.8E-06	1.2E-09	5.4E-09
7,12-Dimethylbenz(a)anthracene	1.6E-05	1.1E-08	4.8E-08
Acenaphthene	1.8E-06	1.2E-09	5.4E-09
Acenaphthylene	1.8E-06	1.2E-09	5.4E-09
Anthracene	2.4E-06	1.6E-09	7.2E-09
Benz(a)anthracene	1.8E-06	1.2E-09	5.4E-09
Benzene	2.1E-03	1.4E-06	6.3E-06
Benzo(a)pyrene	1.2E-06	8.2E-10	3.6E-09
Benzo(b)fluoranthene	1.8E-06	1.2E-09	5.4E-09
Benzo(g,h,i)perylene	1.2E-06	8.2E-10	3.6E-09
Benzo(k)fluoranthene	1.8E-06	1.2E-09	5.4E-09
Chrysene	1.8E-06	1.2E-09	5.4E-09
Dibenzo(a,h) anthracene	1.2E-06	8.2E-10	3.6E-09
Dichlorobenzene	1.2E-03	8.2E-07	3.6E-06
Fluoranthene	3.0E-06	2.0E-09	8.9E-09
Fluorene	2.8E-06	1.9E-09	8.3E-09
Formaldehyde	7.5E-02	5.1E-05	2.2E-04
Hexane	1.8E+00	1.2E-03	5.4E-03
Indo(1,2,3-cd)pyrene	1.8E-06	1.2E-09	5.4E-09
Naphthalene	6.1E-04	4.2E-07	1.8E-06
Phenanthrene	1.7E-05	1.2E-08	5.1E-08
Pyrene	5.0E-06	3.4E-09	1.5E-08
Toluene	3.4E-03	2.3E-06	1.0E-05
Arsenic	2.0E-04	1.4E-07	6.0E-07
Beryllium	1.2E-05	8.2E-09	3.6E-08
Cadmium	1.1E-03	7.5E-07	3.3E-06
Chromium	1.4E-03	9.5E-07	4.2E-06
Cobalt	8.4E-05	5.7E-08	2.5E-07
Manganese	3.8E-04	2.6E-07	1.1E-06
Mercury	2.6E-04	1.8E-07	7.8E-07
Nickel	2.1E-03	1.4E-06	6.3E-06
Selenium	2.4E-05	1.6E-08	7.2E-08
Total HAP		**1.3E-03**	**5.6E-03**

[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: GLO 76 Wellpad
Project Description: G70 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	485	6.38	27.96
Pump Seals	Light Liquid	1.99E-02	1	0.04	0.19
Pressure Relief Valves	Gas	1.04E-01	51	11.69	51.22
Connectors	All	1.83E-03	2,028	8.18	35.84
Open-Ended Lines	All	1.70E-03	25	0.09	0.41
			Emission Totals:	**26.40**	**115.61**

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

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	0.047	2.9E-04	<0.001	5.2E-05	<0.001	1.3E-04	<0.001
Light Liquid	1.000	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
All	0.047	2.9E-04	<0.001	5.2E-05	<0.001	1.3E-04	<0.001

Company Name: **EQT Production, LLC**
Facility Name: **GLO 76 Wellpad**
Project Description: **G70 Application**

Fugitive Components

[1] All weight fractions are based on a representative gas analysis.

VOC and HAP Fugitive Emissions

Pollutant	Hourly Fugitive Emissions (lb/hr)	Annual Fugitive Emissions (tpy)
VOC	1.277	5.59
Hexane	7.6E-03	3.3E-02
Benzene	<0.001	<0.001
Toluene	1.4E-03	6.0E-03
Ethylbenzene	<0.001	<0.001
2,2,4-trimethylpentane	3.4E-03	1.5E-02
Xylene	<0.001	<0.001
Total HAP	1.2E-02	5.4E-02

GHG Fugitive Emissions from Component Leaks

Component	Component Count[1]	GHG Emission Factor[2] (scf/hr/component)	CH_4 Emissions[3,4] (tpy)	CO_2 Emissions[3,4] (tpy)	CO_2e Emissions[5] (tpy)
Connectors	2,028	3.0E-03	1.0E+00	5.2E-03	2.5E+01
Open-Ended Lines	25	6.1E-02	2.5E-01	1.3E-03	6.3E+00
Pressure Relief Devices	51	4.0E-02	3.4E-01	1.7E-03	8.5E+00
Pneumatic Devices	45	6.0E+00	4.5E+01	2.3E-01	1.1E+03
Valves	485	2.7E-02	2.2E+00	1.1E-02	5.4E+01
Total			**48.7**	**0.250**	**1218**

[1] The component count for pneumatics assumes 5 pneumatics per well.
[2] 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.
[3] Calculated in accordance with Equations W-31, W-35 and W-36 in Subpart W of 40 CFR 98.
[4] Mole fractions of CH_4 and CO_2 based on gas analysis:

CH_4: 89.74% CO_2: 0.17%

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

Carbon Dioxide (CO_2): 1 Methane (CH_4): 25

Company Name: **EQT Production, LLC**
Facility Name: **GLO 76 Wellpad**
Project Description: **G70 Application**

Liquid Loading

Liquid Loading Losses:

Uncontrolled Loading Losses: L_L (lb/10^3 gal) = 12.46 (SPM)/T

Controlled Loading Losses: L_L (lb/10^3 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%	
Control Efficiency	0%	
P	0.29	max true vapor pressure of liquid loaded (psia) - EPA TANKS Data
M	18.77	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)
Liquids Hauling	0.2	9,972,333	0.96

[1] Sum of the annual throughput from each well at the pad including the sand separator tank.

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	Uncontrolled 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	1.9E-01
Isobutane	0.867	46.110	4.0E-01	6.1E-02	5.8E+01	3.6E+00	4.9E-02	4.7E-02
n-Butane	2.986	32.045	9.6E-01	1.5E-01	5.8E+01	8.5E+00	1.2E-01	1.1E-01
Isopentane	3.103	12.530	3.9E-01	5.9E-02	7.2E+01	4.3E+00	5.9E-02	5.7E-02
n-Pentane	3.943	8.433	3.3E-01	5.1E-02	7.2E+01	3.7E+00	5.1E-02	4.9E-02
n-Hexane	4.692	2.436	1.1E-01	1.7E-02	8.6E+01	1.5E+00	2.1E-02	2.0E-02
Other Hexanes	4.939	2.436	1.2E-01	1.8E-02	8.6E+01	1.6E+00	2.2E-02	2.1E-02
Heptanes	14.686	0.735	1.1E-01	1.7E-02	9.8E+01	1.6E+00	2.2E-02	2.2E-02
Benzene	0.200	1.508	3.0E-03	4.6E-04	7.8E+01	3.6E-02	5.0E-04	4.8E-04
Toluene	1.138	0.425	4.8E-03	7.4E-04	9.2E+01	6.8E-02	9.4E-04	9.1E-04
Ethylbenzene	0.155	0.151	2.3E-04	3.6E-05	1.1E+02	3.8E-03	5.3E-05	5.1E-05
Xylenes	1.763	0.180	3.2E-03	4.8E-04	1.1E+02	5.1E-02	7.1E-04	6.9E-04
2,2,4-Trimethylpentane	0.031	0.596	1.8E-04	2.8E-05	1.1E+02	3.2E-03	4.5E-05	4.3E-05
C8+ Heavies	59.154	3.400	2.0E+00	3.1E-01	1.1E+02	3.3E+01	4.6E-01	4.4E-01
	100.0		6.54			72.15	1.00	
Total Emissions:								0.96
Total HAP Emissions:								0.02

[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: **EQT Production, LLC**
Facility Name: **GLO 76 Wellpad**
Project Description: **G70 Application**

Haul Roads

Estimated Potential Road Fugitive Emissions

Unpaved Road Emissions

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

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

Description	Weight of Empty Truck (tons)	Weight of Truck w/ Max Load (tons)	Mean Vehicle Weight (tons)	Length of Unpaved Road Traveled (mile/trip)	Trips Per Year	Mileage Per Year	Control (%)	Emissions (tpy) PM	PM_{10}	$PM_{2.5}$
Liquids Hauling	20	40	30	0.38	2,493	944	0	2.02	0.52	0.052
Employee Vehicles	3	3	3	0.38	200	76	0	0.06	0.01	0.001
Total Potential Emissions								**2.08**	**0.53**	**0.05**

Company Name: EQT Production, LLC
Facility Name: GLO 76 Wellpad
Project Description: G70 Application

Combustor Flow Rate Calculations

REGENERATOR OVERHEADS AND FLASH TANK OFF GAS STREAM (FROM GRI-GLYCALC) [1]

Component	lb/hr	lb-mol/hr	mol%	MW lb/lb-mol	MW in Mixture
Carbon Dioxide	1.183	0.027	0.004	44.01	0.18
Nitrogen	0.557	0.020	0.003	28.00	0.08
Methane	91.030	5.675	0.864	16.04	13.85
Ethane	19.251	0.640	0.097	30.07	2.93
Propane	5.249	0.119	0.018	44.10	0.80
Isobutane	1.033	0.018	0.003	58.12	0.16
n-Butane	1.296	0.022	0.003	58.12	0.20
Isopentane	0.439	0.006	0.001	72.15	0.07
n-Pentane	0.252	0.003	0.001	72.15	0.04
n-Hexane	0.111	0.001	<0.001	85.67	0.02
Cyclohexane	0.064	0.001	<0.001	84.16	0.01
Other Hexanes	0.305	0.004	0.001	86.18	0.05
Heptanes	0.317	0.003	<0.001	97.88	0.05
2,2,4-Trimethylpentane	0.010	<0.001	<0.001	114.23	0.00
Benzene	0.254	0.003	<0.001	78.11	0.04
Toluene	0.867	0.009	0.001	92.14	0.13
Ethylbenzene	0.658	0.006	0.001	106.17	0.10
Xylenes	0.904	0.009	0.001	106.17	0.14
C8 + Heavies	0.339	0.003	<0.001	107.73	0.052
Total	124.12	6.57		18.89	lb/lbmole

1. Representative gas stream from the dehydration unit regenerator and flash tank flowing to the combustor.

C001

Combustor Rating	8.33	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	24	scf/hr	
Combustor Flow Capacity	134.56	MSCFD	Max. flowrate from LEED Combustor Operations Manual
	5,607	scf/hr	
	93	scf/min	

Enclosed Combustor Mass Flow Rate (C001)

$$\frac{5{,}607\ \text{scf}}{\text{hr}} * \frac{1\ \text{lbmole}}{379\ \text{scf}} * \frac{18.89\ \text{lb}}{\text{lbmole}} = \frac{279\ \text{lb}}{\text{hr}}$$

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

Company Name: **EQT Production, LLC**
Facility Name: **GLO 76 Wellpad**
Project Description: **G70 Application**

Gas Analysis

Sample Location: Big 57 Dehy Inlet
Sample Date: 11/20/2014
HHV (Btu/scf): 1,102

Constituent	Natural Gas Stream Speciation (Mole %)	Molecular Weight	Molar Weight	Average Weight Fraction	Natural Gas Stream Speciation (Wt. %)
Carbon Dioxide	0.168	44.01	7.4E-02	4.1E-03	4.1E-01
Nitrogen	0.311	28.01	8.7E-02	4.9E-03	4.9E-01
Methane	89.740	16.04	1.4E+01	8.1E-01	8.1E+01
Ethane	8.085	30.07	2.4E+00	1.4E-01	1.4E+01
Propane	1.252	44.10	5.5E-01	3.1E-02	3.1E+00
Isobutane	0.160	58.12	9.3E-02	5.2E-03	5.2E-01
n-Butane	0.173	58.12	1.0E-01	5.6E-03	5.6E-01
Isopentane	0.047	72.15	3.4E-02	1.9E-03	1.9E-01
n-Pentane	0.023	72.15	1.7E-02	9.3E-04	9.3E-02
n-Hexane	0.006	86.18	5.2E-03	2.9E-04	2.9E-02
Cyclohexane	0.001	84.16	8.4E-04	4.7E-05	4.7E-03
Other Hexanes	0.021	86.18	1.8E-02	1.0E-03	1.0E-01
Heptanes	0.009	100.21	9.0E-03	5.1E-04	5.1E-02
2,2,4-Trimethylpentane	0.002	114.23	2.3E-03	1.3E-04	1.3E-02
Benzene*	<0.001	78.11	0.0E+00	0.0E+00	0.0E+00
Toluene*	0.001	92.14	9.2E-04	5.2E-05	5.2E-03
Ethylbenzene*	<0.001	106.17	<0.001	<0.001	<0.001
Xylenes*	<0.001	106.16	0.0E+00	0.0E+00	0.0E+00
C8 + Heavies	0.001	114.23	1.1E-03	6.4E-05	6.4E-03
Totals	100		17.82	1.00	100

TOC (Total)	99.52				99.10
VOC (Total)	1.70				4.68
HAP (Total)	0.01				0.05

Company Name: **EQT Production, LLC**
Facility Name: **GLO 76 Wellpad**
Project Description: **G70 Application**

Produced Water Throughput Sample Calculations

Throughput Parameter	Value	Units
Operational Hours	8,760	hrs/yr
Total Condensate Throughput	0	bbl/month
Total Produced Water Throughput	19,506	bbl/month
Produced Water % Condensate	1%	Conservative Estimate

Total Produced Fluid Throughput for E&P Tank is calculated according to the following:

$$Throughput\ per\ Tank\left(\frac{bbl}{day}\right) = \frac{\left(Condensate\ Throughput\left(\frac{bbl}{month}\right) + \left(Produced\ Water\ Throughput\left(\frac{bbl}{month}\right) \times 1\%\ (Condensate\ in\ Produced\ Water)\right) \times \frac{12\left(\frac{months}{year}\right)}{365\left(\frac{days}{year}\right)}\right)}{Number\ of\ tanks\ at\ wellpad}$$

$$\frac{0\ \textbf{bbl}/\textbf{month} + 19{,}506\ \textbf{bbl}/\textbf{month} * 1\%\ \textbf{Condensate \% in PW} * 12\ \textbf{months}/\textbf{year} * 1\ \textbf{year}/365\ \textbf{days}}{10\ \textbf{\# of Tanks at Wellpad}}$$

Total Produced Fluid Throughput for E&P = $\frac{\textbf{1}}{\textbf{bbl}/\textbf{day -tank}}$

```
**********************************************************************************
******
*     Project Setup Information
    *
**********************************************************************************
******
Project File              : \\tsclient\Z\Client\EQT Corporation\West Virginia\WV
Production Wells\153901.0056 WV Wellpads 2015\GLO 76\02
Draft\2015-1027_EQT_GLO-76_G70 Ap_Revised\Attach I - Emission Calcs\E&P
Tank\20151029_GLO-76_Produced Water Tank.ept
Flowsheet Selection       : Oil Tank with Separator
Calculation Method        : RVP Distillation
Control Efficiency        : 100.0%
Known Separator Stream    : Low Pressure Oil
Entering Air Composition  : No

Filed Name                : EQT -  GLO 76 Condensate Tanks
Well Name                 : PTE for G70A  Application
Well ID                   : Condensate Analysis from BIG-192 Wellpad (Sample date
9/12/2014)
Date                      : 2015.10.29


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

Separator Pressure        : 80.00[psig]
Separator Temperature     : 60.00[F]
Ambient Pressure          : 14.70[psia]
Ambient Temperature       : 55.00[F]
C10+ SG                   : 0.7861
C10+ MW                   : 168.15

-- Low Pressure Oil
--------------------------------------------------------------------------
   No.    Component             mol %
   1      H2S                    0.0000
   2      O2                     0.0000
   3      CO2                    0.0060
   4      N2                     0.0000
   5      C1                     0.4330
   6      C2                     0.3350
   7      C3                     0.4850
   8      i-C4                   0.2770
   9      n-C4                   0.6680
   10     i-C5                   0.6310
   11     n-C5                   0.5480
   12     C6                     1.1670
   13     C7                     7.7640
   14     C8                    17.5600
   15     C9                    14.4830
   16     C10+                  47.7340
   17     Benzene                0.0370
   18     Toluene                0.9610
   19     E-Benzene              0.2690
   20     Xylenes                5.8420
   21     n-C6                   0.7890
   22     224Trimethylp          0.0110
```

-- Sales Oil

Production Rate : 1[bbl/day]
Days of Annual Operation : 365 [days/year]
API Gravity : 59.11
Reid Vapor Pressure : 1.00[psia]

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

-- Emission Summary

Item	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]

Page 1---------- E&P TANK

Total HAPs	0.000	0.000
Total HC	0.253	0.058
VOCs, C2+	0.231	0.053
VOCs, C3+	0.200	0.046

Uncontrolled Recovery Info.

Vapor	12.5700 x1E-3	[MSCFD]
HC Vapor	12.5300 x1E-3	[MSCFD]
GOR	12.57	[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	0.001	0.000
4	N2	0.000	0.000
5	C1	0.021	0.005
6	C2	0.031	0.007
7	C3	0.065	0.015
8	i-C4	0.039	0.009
9	n-C4	0.068	0.016
10	i-C5	0.011	0.003
11	n-C5	0.005	0.001
12	C6	0.002	0.000
13	C7	0.004	0.001
14	C8	0.003	0.001
15	C9	0.001	0.000
16	C10+	0.000	0.000
17	Benzene	0.000	0.000
18	Toluene	0.000	0.000
19	E-Benzene	0.000	0.000
20	Xylenes	0.001	0.000
21	n-C6	0.001	0.000
22	224Trimethylp	0.000	0.000
	Total	0.253	0.058

-- Stream Data

No.	Component	MW	LP Oil	Flash Oil	Sale Oil	Flash Gas	W&S Gas	Total Emissions
			mol %	mol %	mol %	mol %	mol %	mol %
1	H2S	34.80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	O2	32.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	CO2	44.01	0.0060	0.0060	0.0000	0.0000	0.3065	0.3065
4	N2	28.01	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
5	C1	16.04	0.4330	0.4330	0.0000	0.0000	22.1152	22.1152
6	C2	30.07	0.3350	0.3350	0.0001	0.0000	17.1058	17.1058
7	C3	44.10	0.4850	0.4850	0.0067	0.0000	24.4356	24.4356
8	i-C4	58.12	0.2770	0.2770	0.0594	0.0000	11.1733	11.1733
9	n-C4	58.12	0.6680	0.6680	0.2975	0.0000	19.2242	19.2242
10	i-C5	72.15	0.6310	0.6310	0.5939	0.0000	2.4885	2.4885
11	n-C5	72.15	0.5480	0.5480	0.5361	0.0000	1.1447	1.1447
12	C6	86.16	1.1670	1.1670	1.1834	0.0000	0.3483	0.3483
13	C7	100.20	7.7640	7.7640	7.9055	0.0000	0.6787	0.6787
14	C8	114.23	17.5600	17.5600	17.9010	0.0000	0.4832	0.4832
15	C9	128.28	14.4830	14.4830	14.7692	0.0000	0.1489	0.1489
16	C10+	168.15	47.7340	47.7340	48.6867	0.0000	0.0258	0.0258
17	Benzene	78.11	0.0370	0.0370	0.0376	0.0000	0.0071	0.0071
18	Toluene	92.13	0.9610	0.9610	0.9792	0.0000	0.0484	0.0484
19	E-Benzene	106.17	0.2690	0.2690	0.2743	0.0000	0.0045	0.0045
20	Xylenes	106.17	5.8420	5.8420	5.9570	0.0000	0.0854	0.0854
21	n-C6	86.18	0.7890	0.7890	0.8013	0.0000	0.1750	0.1750
22	224Trimethylp	114.24	0.0110	0.0110	0.0112	0.0000	0.0008	0.0008
	MW		135.89	135.89	137.77	0.00	41.90	41.90
	Stream Mole Ratio		1.0000	1.0000	0.9804	0.0000	0.0196	0.0196
	Heating Value	[BTU/SCF]				0.00	2387.71	2387.71
	Gas Gravity	[Gas/Air]				0.00	1.45	1.45
	Bubble Pt. @ 100F	[psia]	18.49	18.49	1.00			

RVP @ 100F	[psia]	5.07	5.07	0.96	

Spec. Gravity @ 100F	0.726	0.726	0.728

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*******************************************************************************
******
*     Project Setup Information
    *
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******
Project File              : \\tsclient\Z\Client\EQT Corporation\West Virginia\WV
Production Wells\153901.0056 WV Wellpads 2015\GLO 76\02
Draft\2015-0727_EQT_GLO-76_G70 Application\Attach I - Emission Calcs\E&P
Tank\20150727_GLO-76_Sand Separator Tank.ept
Flowsheet Selection       : Oil Tank with Separator
Calculation Method        : RVP Distillation
Control Efficiency        : 100.0%
Known Separator Stream    : Low Pressure Oil
Entering Air Composition  : No

Filed Name                : EQT -  GLO 76 Sand Separator Tank
Well Name                 : PTE for G70A  Application
Well ID                   : Condensate Analysis from BIG-192 Wellpad (Sample date
9/12/2014)
Date                      : 2015.07.27


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

Separator Pressure        : 1000.00[psig]
Separator Temperature     : 60.00[F]
Ambient Pressure          : 14.70[psia]
Ambient Temperature       : 55.00[F]
C10+ SG                   : 0.7861
C10+ MW                   : 168.15

-- Low Pressure Oil
-------------------------------------------------------------------------
   No.    Component             mol %
   1      H2S                    0.0000
   2      O2                     0.0000
   3      CO2                    0.0060
   4      N2                     0.0000
   5      C1                     0.4330
   6      C2                     0.3350
   7      C3                     0.4850
   8      i-C4                   0.2770
   9      n-C4                   0.6680
   10     i-C5                   0.6310
   11     n-C5                   0.5480
   12     C6                     1.1670
   13     C7                     7.7640
   14     C8                    17.5600
   15     C9                    14.4830
   16     C10+                  47.7340
   17     Benzene                0.0370
   18     Toluene                0.9610
   19     E-Benzene              0.2690
   20     Xylenes                5.8420
   21     n-C6                   0.7890
   22     224Trimethylp          0.0110
```

-- Sales Oil

Production Rate : 0.1[bbl/day]
Days of Annual Operation : 365 [days/year]
API Gravity : 59.11
Reid Vapor Pressure : 1.00[psia]

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

-- Emission Summary

Item	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]

Page 1---------- E&P TANK

Total HAPs	0.000	0.000
Total HC	0.026	0.006
VOCs, C2+	0.023	0.005
VOCs, C3+	0.020	0.005

Uncontrolled Recovery Info.

Vapor	1.2600 x1E-3	[MSCFD]
HC Vapor	1.2600 x1E-3	[MSCFD]
GOR	12.60	[SCF/bbl]

-- Emission Composition

No	Component	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]
1	H2S	0.000	0.000
2	O2	0.000	0.000
3	CO2	0.000	0.000
4	N2	0.000	0.000
5	C1	0.002	0.000
6	C2	0.003	0.001
7	C3	0.007	0.002
8	i-C4	0.004	0.001
9	n-C4	0.007	0.002
10	i-C5	0.001	0.000
11	n-C5	0.001	0.000
12	C6	0.000	0.000
13	C7	0.000	0.000
14	C8	0.000	0.000
15	C9	0.000	0.000
16	C10+	0.000	0.000
17	Benzene	0.000	0.000
18	Toluene	0.000	0.000
19	E-Benzene	0.000	0.000
20	Xylenes	0.000	0.000
21	n-C6	0.000	0.000
22	224Trimethylp	0.000	0.000
	Total	0.025	0.006

-- Stream Data

No.	Component	MW	LP Oil	Flash Oil	Sale Oil	Flash Gas	W&S Gas	Total Emissions
			mol %	mol %	mol %	mol %	mol %	mol %
1	H2S	34.80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	O2	32.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	CO2	44.01	0.0060	0.0059	0.0000	0.3678	0.3046	0.3052
4	N2	28.01	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
5	C1	16.04	0.4330	0.4186	0.0000	79.9252	21.4832	22.0208
6	C2	30.07	0.3350	0.3331	0.0001	10.7360	17.0907	17.0323
7	C3	44.10	0.4850	0.4843	0.0068	4.3275	24.5099	24.3242
8	i-C4	58.12	0.2770	0.2769	0.0598	0.9311	11.2021	11.1077
9	n-C4	58.12	0.6680	0.6678	0.2967	1.5436	19.3414	19.1777
10	i-C5	72.15	0.6310	0.6310	0.5921	0.5384	2.5906	2.5717
11	n-C5	72.15	0.5480	0.5480	0.5349	0.3400	1.2104	1.2024
12	C6	86.16	1.1670	1.1672	1.1827	0.2138	0.3846	0.3830
13	C7	100.20	7.7640	7.7653	7.9044	0.4571	0.7648	0.7619
14	C8	114.23	17.5600	17.5631	17.9012	0.3151	0.5529	0.5507
15	C9	128.28	14.4830	14.4856	14.7700	0.0868	0.1725	0.1717
16	C10+	168.15	47.7340	47.7426	48.6908	0.0126	0.0309	0.0308
17	Benzene	78.11	0.0370	0.0370	0.0376	0.0046	0.0079	0.0078
18	Toluene	92.13	0.9610	0.9612	0.9792	0.0321	0.0548	0.0546
19	E-Benzene	106.17	0.2690	0.2690	0.2743	0.0029	0.0052	0.0051
20	Xylenes	106.17	5.8420	5.8430	5.9572	0.0536	0.0982	0.0978
21	n-C6	86.18	0.7890	0.7891	0.8009	0.1113	0.1945	0.1938
22	224Trimethylp	114.24	0.0110	0.0110	0.0112	0.0005	0.0009	0.0009
	MW		135.89	135.91	137.77	21.48	42.30	42.11
	Stream Mole Ratio		1.0000	0.9998	0.9803	0.0002	0.0195	0.0197
	Heating Value	[BTU/SCF]				1292.84	2408.79	2398.53
	Gas Gravity	[Gas/Air]				0.74	1.46	1.45
	Bubble Pt. @ 100F	[psia]	18.49	18.01	1.00			

	RVP @ 100F	[psia]	5.07	5.02	0.96			

Spec. Gravity @ 100F	0.726	0.726	0.728

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

Identification

User Identification:	GLO-76 Liquid Loading
City:	
State:	
Company:	
Type of Tank:	Vertical Fixed Roof Tank
Description:	Liquid Loading parameters for GLO-76 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:	593.59
Net Throughput(gal/yr):	9,972,333.00
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

Meterological 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

GLO-76 Liquid Loading - Vertical Fixed Roof Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Produced Fluid	All	55.41	46.54	64.27	51.30	0.2195	0.1638	0.2912	18.7659			18.17	
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	0.0002	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	0.0044	0.0006	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	0.0012	0.0029	100.20	Option 3: A=37358, B=8.2585
Hexane (-n)						1.6957	1.3330	2.1360	86.1700	0.0007	0.0052	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Isopentane						9.0329	7.1932	11.0836	72.1500	0.0002	0.0076	72.15	Option 1: VP50 = 7.889 VP60 = 10.005
Nonane (-n)						0.0588	0.0475	0.0729	128.2600	0.0014	0.0004	128.26	Option 1: VP50 = .051285 VP60 = .065278
Octane (-n)						0.1303	0.1035	0.1637	114.2300	0.0013	0.0008	114.23	Option 1: VP50 = .112388 VP60 = .145444
Pentane (-n)						6.1673	5.0301	7.5097	72.1500	0.0002	0.0065	72.15	Option 3: A=27691, B=7.558
Propane (-n)						100.7917	87.8791	115.0985	44.0956	0.0001	0.0356	44.10	Option 2: A=7.340862493, B=1104.2267744, C=291.70993941
Toluene						0.2857	0.2141	0.3766	92.1300	0.0001	0.0001	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Water						0.2153	0.1602	0.2863	18.0150	0.9900	0.9399	18.02	Option 1: VP50 = .178 VP60 = .247
Xylene (-o)						0.0601	0.0431	0.0827	106.1700	0.0002	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)

GLO-76 Liquid Loading - Vertical Fixed Roof Tank

Annual Emission Calcaulations	
Standing Losses (lb):	6.6848
Vapor Space Volume (cu ft):	1,130.9734
Vapor Density (lb/cu ft):	0.0007
Vapor Space Expansion Factor:	0.0243
Vented Vapor Saturation Factor:	0.8958
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):	0.0007
Vapor Molecular Weight (lb/lb-mole):	18.7659
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.2195
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:	0.0243
Daily Vapor Temperature Range (deg. R):	35.4636
Daily Vapor Pressure Range (psia):	0.1274
Breather Vent Press. Setting Range(psia):	0.7300
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.2195
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.1638
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.2912
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:	0.8958
Vapor Pressure at Daily Average Liquid:	
Surface Temperature (psia):	0.2195
Vapor Space Outage (ft):	10.0000
Working Losses (lb):	212.4802
Vapor Molecular Weight (lb/lb-mole):	18.7659
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.2195
Annual Net Throughput (gal/yr.):	9,972,333.0000
Annual Turnovers:	593.5913
Turnover Factor:	0.2172
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):	219.1650

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

Emissions Report for: Annual

GLO-76 Liquid Loading - Vertical Fixed Roof Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Produced Fluid	212.48	6.68	219.17
Propane (-n)	7.56	0.24	7.79
Butane (-n)	0.08	0.00	0.08
Isopentane	1.61	0.05	1.66
Pentane (-n)	1.39	0.04	1.43
Hexane (-n)	1.11	0.03	1.15
Benzene	0.01	0.00	0.01
Heptane (-n)	0.61	0.02	0.63
Toluene	0.03	0.00	0.03
Octane (-n)	0.16	0.01	0.17
Ethylbenzene	0.00	0.00	0.00
Xylene (-o)	0.01	0.00	0.01
Nonane (-n)	0.08	0.00	0.08
Decane (-n)	0.12	0.00	0.13
Water	199.71	6.28	206.00

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: GLO-76
File Name: Z:\Client\EQT Corporation\West Virginia\WV Production Wells\153901.0056 WV Wellpads 2015\GLO 76\02 Draft\2015-1027 EQT GLO-76_G70 Ap_Revised\Attach I - Emission Calcs\GLYCalc\20151027 GLO 76 Dehy PTE_v1.3.ddf
Date: October 28, 2015

DESCRIPTION:

Description: DEHY 65 MMSCFD
Max Pump Rate: 7.5 GPM
BIG57 Gas Analysis Sample: 11/20/14

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

CONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.0788	1.892	0.3454
Ethane	0.0666	1.598	0.2916
Propane	0.0433	1.040	0.1898
Isobutane	0.0135	0.325	0.0593
n-Butane	0.0221	0.530	0.0967
Isopentane	0.0088	0.212	0.0387
n-Pentane	0.0061	0.147	0.0268
Cyclopentane	0.0015	0.036	0.0066
n-Hexane	0.0041	0.098	0.0179
Cyclohexane	0.0036	0.088	0.0160
Other Hexanes	0.0094	0.226	0.0413
Heptanes	0.0160	0.384	0.0701
Methylcyclohexane	0.0050	0.119	0.0217
2,2,4-Trimethylpentane	0.0004	0.009	0.0017
Benzene	0.0173	0.416	0.0760
Toluene	0.0599	1.438	0.2624
Ethylbenzene	0.0458	1.099	0.2006
Xylenes	0.0630	1.513	0.2760
C8+ Heavies	0.0224	0.538	0.0982
Total Emissions	0.4879	11.709	2.1369
Total Hydrocarbon Emissions	0.4879	11.709	2.1369
Total VOC Emissions	0.3425	8.219	1.4999
Total HAP Emissions	0.1906	4.574	0.8347
Total BTEX Emissions	0.1861	4.466	0.8151

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	1.1264	27.034	4.9336
Ethane	0.9511	22.826	4.1658
Propane	0.6191	14.859	2.7118
Isobutane	0.1933	4.639	0.8465
n-Butane	0.3154	7.570	1.3815
Isopentane	0.1261	3.027	0.5525

n-Pentane	0.0876	2.101	0.3835
Cyclopentane	0.0216	0.519	0.0948
n-Hexane	0.0584	1.402	0.2558
Cyclohexane	0.0521	1.250	0.2281
Other Hexanes	0.1347	3.234	0.5902
Heptanes	0.2286	5.487	1.0014
Methylcyclohexane	0.0708	1.700	0.3103
2,2,4-Trimethylpentane	0.0056	0.134	0.0245
Benzene	0.2478	5.946	1.0852
Toluene	0.8560	20.543	3.7491
Ethylbenzene	0.6544	15.705	2.8661
Xylenes	0.9003	21.608	3.9434
C8+ Heavies	0.3203	7.687	1.4029
Total Emissions	6.9696	167.271	30.5270
Total Hydrocarbon Emissions	6.9696	167.271	30.5270
Total VOC Emissions	4.8921	117.412	21.4276
Total HAP Emissions	2.7224	65.338	11.9241
Total BTEX Emissions	2.6584	63.802	11.6438

FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	6.2907	150.976	27.5531
Ethane	1.2811	30.746	5.6111
Propane	0.3243	7.784	1.4206
Isobutane	0.0588	1.411	0.2574
n-Butane	0.0687	1.648	0.3007
Isopentane	0.0219	0.527	0.0961
n-Pentane	0.0115	0.276	0.0504
Cyclopentane	0.0008	0.018	0.0033
n-Hexane	0.0037	0.089	0.0162
Cyclohexane	0.0008	0.020	0.0037
Other Hexanes	0.0119	0.286	0.0521
Heptanes	0.0061	0.147	0.0269
Methylcyclohexane	0.0008	0.019	0.0035
2,2,4-Trimethylpentane	0.0003	0.008	0.0014
Benzene	0.0004	0.009	0.0017
Toluene	0.0008	0.018	0.0033
Ethylbenzene	0.0003	0.007	0.0013
Xylenes	0.0003	0.006	0.0012
C8+ Heavies	0.0013	0.031	0.0057
Total Emissions	8.0844	194.026	35.4098
Total Hydrocarbon Emissions	8.0844	194.026	35.4098
Total VOC Emissions	0.5127	12.304	2.2456
Total HAP Emissions	0.0057	0.138	0.0251
Total BTEX Emissions	0.0017	0.041	0.0075

FLASH TANK OFF GAS

Component	lbs/hr	lbs/day	tons/yr
Methane	89.8666	2156.798	393.6156
Ethane	18.3011	439.226	80.1588
Propane	4.6333	111.200	20.2940
Isobutane	0.8396	20.152	3.6777
n-Butane	0.9808	23.540	4.2960

Isopentane	0.3135	7.524	1.3730
n-Pentane	0.1642	3.942	0.7194
Cyclopentane	0.0107	0.257	0.0470
n-Hexane	0.0528	1.267	0.2312
Cyclohexane	0.0120	0.288	0.0526
Other Hexanes	0.1700	4.081	0.7447
Heptanes	0.0878	2.107	0.3845
Methylcyclohexane	0.0114	0.273	0.0498
2,2,4-Trimethylpentane	0.0047	0.113	0.0206
Benzene	0.0056	0.134	0.0245
Toluene	0.0109	0.260	0.0475
Ethylbenzene	0.0042	0.102	0.0185
Xylenes	0.0038	0.090	0.0165
C8+ Heavies	0.0187	0.448	0.0817
Total Emissions	115.4917	2771.801	505.8537
Total Hydrocarbon Emissions	115.4917	2771.801	505.8537
Total VOC Emissions	7.3240	175.777	32.0793
Total HAP Emissions	0.0819	1.967	0.3589
Total BTEX Emissions	0.0244	0.587	0.1071

COMBINED REGENERATOR VENT/FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	6.3695	152.868	27.8984
Ethane	1.3477	32.344	5.9027
Propane	0.3677	8.824	1.6104
Isobutane	0.0723	1.735	0.3167
n-Butane	0.0907	2.178	0.3974
Isopentane	0.0308	0.739	0.1348
n-Pentane	0.0176	0.423	0.0772
Cyclopentane	0.0023	0.054	0.0099
n-Hexane	0.0078	0.187	0.0341
Cyclohexane	0.0045	0.108	0.0197
Other Hexanes	0.0213	0.512	0.0934
Heptanes	0.0221	0.532	0.0970
Methylcyclohexane	0.0058	0.138	0.0252
2,2,4-Trimethylpentane	0.0007	0.017	0.0032
Benzene	0.0177	0.426	0.0777
Toluene	0.0607	1.456	0.2658
Ethylbenzene	0.0461	1.106	0.2019
Xylenes	0.0633	1.519	0.2772
C8+ Heavies	0.0237	0.569	0.1039
Total Emissions	8.5723	205.735	37.5466
Total Hydrocarbon Emissions	8.5723	205.735	37.5466
Total VOC Emissions	0.8551	20.523	3.7455
Total HAP Emissions	0.1963	4.711	0.8598
Total BTEX Emissions	0.1878	4.507	0.8226

COMBINED REGENERATOR VENT/FLASH GAS EMISSION CONTROL REPORT:

Component	Uncontrolled tons/yr	Controlled tons/yr	% Reduction

Methane	398.5492	27.8984	93.00
Ethane	84.3246	5.9027	93.00
Propane	23.0058	1.6104	93.00
Isobutane	4.5242	0.3167	93.00
n-Butane	5.6775	0.3974	93.00
Isopentane	1.9255	0.1348	93.00
n-Pentane	1.1029	0.0772	93.00
Cyclopentane	0.1417	0.0099	93.00
n-Hexane	0.4870	0.0341	93.00
Cyclohexane	0.2808	0.0197	93.00
Other Hexanes	1.3349	0.0934	93.00
Heptanes	1.3858	0.0970	93.00
Methylcyclohexane	0.3601	0.0252	93.00
2,2,4-Trimethylpentane	0.0451	0.0032	93.00
Benzene	1.1097	0.0777	93.00
Toluene	3.7967	0.2658	93.00
Ethylbenzene	2.8847	0.2019	93.00
Xylenes	3.9598	0.2772	93.00
C8+ Heavies	1.4846	0.1039	93.00
Total Emissions	536.3807	37.5466	93.00
Total Hydrocarbon Emissions	536.3807	37.5466	93.00
Total VOC Emissions	53.5069	3.7455	93.00
Total HAP Emissions	12.2830	0.8598	93.00
Total BTEX Emissions	11.7509	0.8226	93.00

EQUIPMENT REPORTS:

COMBUSTION DEVICE

Ambient Temperature: 60.00 deg. F
Excess Oxygen: 5.00 %
Combustion Efficiency: 93.00 %
Supplemental Fuel Requirement: 7.69e-002 MM BTU/hr

Component	Emitted	Destroyed
Methane	7.00%	93.00%
Ethane	7.00%	93.00%
Propane	7.00%	93.00%
Isobutane	7.00%	93.00%
n-Butane	7.00%	93.00%
Isopentane	7.00%	93.00%
n-Pentane	7.00%	93.00%
Cyclopentane	7.00%	93.00%
n-Hexane	7.00%	93.00%
Cyclohexane	7.00%	93.00%
Other Hexanes	7.00%	93.00%
Heptanes	7.00%	93.00%
Methylcyclohexane	7.00%	93.00%
2,2,4-Trimethylpentane	7.00%	93.00%
Benzene	7.00%	93.00%
Toluene	7.00%	93.00%
Ethylbenzene	7.00%	93.00%
Xylenes	7.00%	93.00%
C8+ Heavies	7.00%	93.00%

ABSORBER

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

Calculated Absorber Stages:	1.25	
Calculated Dry Gas Dew Point:	3.33	lbs. H2O/MMSCF
Temperature:	90.0	deg. F
Pressure:	800.0	psig
Dry Gas Flow Rate:	65.0000	MMSCF/day
Glycol Losses with Dry Gas:	0.4325	lb/hr
Wet Gas Water Content:	Saturated	
Calculated Wet Gas Water Content:	51.12	lbs. H2O/MMSCF
Calculated Lean Glycol Recirc. Ratio:	3.48	gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	6.50%	93.50%
Carbon Dioxide	99.85%	0.15%
Nitrogen	99.99%	0.01%
Methane	99.99%	0.01%
Ethane	99.97%	0.03%
Propane	99.95%	0.05%
Isobutane	99.92%	0.08%
n-Butane	99.90%	0.10%
Isopentane	99.90%	0.10%
n-Pentane	99.87%	0.13%
Cyclopentane	99.43%	0.57%
n-Hexane	99.78%	0.22%
Cyclohexane	99.01%	0.99%
Other Hexanes	99.83%	0.17%
Heptanes	99.59%	0.41%
Methylcyclohexane	98.91%	1.09%
2,2,4-Trimethylpentane	99.83%	0.17%
Benzene	90.99%	9.01%
Toluene	86.90%	13.10%
Ethylbenzene	82.70%	17.30%
Xylenes	76.21%	23.79%
C8+ Heavies	98.68%	1.32%

FLASH TANK

Flash Control:	Combustion device	
Flash Control Efficiency:	93.00	%
Flash Temperature:	75.0	deg. F
Flash Pressure:	70.0	psig

Component	Left in Glycol	Removed in Flash Gas
Water	99.97%	0.03%
Carbon Dioxide	18.67%	81.33%
Nitrogen	1.18%	98.82%
Methane	1.24%	98.76%
Ethane	4.94%	95.06%

Propane	11.79%	88.21%
Isobutane	18.71%	81.29%
n-Butane	24.33%	75.67%
Isopentane	28.89%	71.11%
n-Pentane	34.98%	65.02%
Cyclopentane	67.02%	32.98%
n-Hexane	52.70%	47.30%
Cyclohexane	81.81%	18.19%
Other Hexanes	44.59%	55.41%
Heptanes	72.37%	27.63%
Methylcyclohexane	86.69%	13.31%
2,2,4-Trimethylpentane	54.76%	45.24%
Benzene	97.90%	2.10%
Toluene	98.85%	1.15%
Ethylbenzene	99.42%	0.58%
Xylenes	99.64%	0.36%
C8+ Heavies	95.12%	4.88%

REGENERATOR

No Stripping Gas used in regenerator.

Component	Remaining in Glycol	Distilled Overhead
Water	32.82%	67.18%
Carbon Dioxide	0.00%	100.00%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%
Propane	0.00%	100.00%
Isobutane	0.00%	100.00%
n-Butane	0.00%	100.00%
Isopentane	0.98%	99.02%
n-Pentane	0.90%	99.10%
Cyclopentane	0.66%	99.34%
n-Hexane	0.70%	99.30%
Cyclohexane	3.63%	96.37%
Other Hexanes	1.53%	98.47%
Heptanes	0.58%	99.42%
Methylcyclohexane	4.32%	95.68%
2,2,4-Trimethylpentane	1.90%	98.10%
Benzene	5.07%	94.93%
Toluene	7.95%	92.05%
Ethylbenzene	10.43%	89.57%
Xylenes	12.94%	87.06%
C8+ Heavies	12.02%	87.98%

STREAM REPORTS:

WET GAS STREAM

Temperature: 90.00 deg. F

Pressure: 814.70 psia
Flow Rate: 2.71e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.08e-001	1.39e+002
Carbon Dioxide	1.68e-001	5.28e+002
Nitrogen	3.11e-001	6.22e+002
Methane	8.96e+001	1.03e+005
Ethane	8.08e+000	1.74e+004
Propane	1.25e+000	3.94e+003
Isobutane	1.60e-001	6.64e+002
n-Butane	1.73e-001	7.18e+002
Isopentane	4.69e-002	2.42e+002
n-Pentane	2.30e-002	1.18e+002
Cyclopentane	9.99e-004	5.01e+000
n-Hexane	5.99e-003	3.69e+001
Cyclohexane	9.99e-004	6.01e+000
Other Hexanes	2.00e-002	1.23e+002
Heptanes	8.99e-003	6.44e+001
Methylcyclohexane	9.99e-004	7.01e+000
2,2,4-Trimethylpentane	4.99e-004	4.08e+000
Benzene	4.99e-004	2.79e+000
Toluene	9.99e-004	6.58e+000
Ethylbenzene	4.99e-004	3.79e+000
Xylenes	4.99e-004	3.79e+000
C8+ Heavies	2.00e-003	2.43e+001
Total Components	100.00	1.27e+005

DRY GAS STREAM

Temperature: 90.00 deg. F
Pressure: 814.70 psia
Flow Rate: 2.71e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	7.01e-003	9.02e+000
Carbon Dioxide	1.68e-001	5.27e+002
Nitrogen	3.11e-001	6.22e+002
Methane	8.97e+001	1.03e+005
Ethane	8.08e+000	1.73e+004
Propane	1.25e+000	3.94e+003
Isobutane	1.60e-001	6.63e+002
n-Butane	1.73e-001	7.17e+002
Isopentane	4.70e-002	2.42e+002
n-Pentane	2.30e-002	1.18e+002
Cyclopentane	9.94e-004	4.98e+000
n-Hexane	5.99e-003	3.68e+001
Cyclohexane	9.90e-004	5.95e+000
Other Hexanes	2.00e-002	1.23e+002
Heptanes	8.96e-003	6.41e+001
Methylcyclohexane	9.89e-004	6.93e+000
2,2,4-Trimethylpentane	4.99e-004	4.07e+000
Benzene	4.55e-004	2.54e+000
Toluene	8.69e-004	5.72e+000
Ethylbenzene	4.14e-004	3.13e+000

Xylenes	3.81e-004	2.89e+000
C8+ Heavies	1.97e-003	2.40e+001
Total Components	100.00	1.27e+005

LEAN GLYCOL STREAM

Temperature: 90.00 deg. F
Flow Rate: 7.50e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.85e+001	4.16e+003
Water	1.50e+000	6.33e+001
Carbon Dioxide	1.82e-012	7.67e-011
Nitrogen	1.60e-013	6.77e-012
Methane	8.06e-018	3.40e-016
Ethane	6.25e-008	2.64e-006
Propane	2.07e-009	8.75e-008
Isobutane	3.63e-010	1.53e-008
n-Butane	4.30e-010	1.81e-008
Isopentane	2.96e-005	1.25e-003
n-Pentane	1.89e-005	7.97e-004
Cyclopentane	3.38e-006	1.43e-004
n-Hexane	9.78e-006	4.13e-004
Cyclohexane	4.65e-005	1.96e-003
Other Hexanes	4.97e-005	2.10e-003
Heptanes	3.16e-005	1.34e-003
Methylcyclohexane	7.57e-005	3.20e-003
2,2,4-Trimethylpentane	2.56e-006	1.08e-004
Benzene	3.13e-004	1.32e-002
Toluene	1.75e-003	7.40e-002
Ethylbenzene	1.80e-003	7.62e-002
Xylenes	3.17e-003	1.34e-001
C8+ Heavies	1.04e-003	4.38e-002
Total Components	100.00	4.22e+003

RICH GLYCOL AND PUMP GAS STREAM

Temperature: 90.00 deg. F
Pressure: 814.70 psia
Flow Rate: 8.03e+000 gpm
NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.29e+001	4.16e+003
Water	4.31e+000	1.93e+002
Carbon Dioxide	2.64e-002	1.18e+000
Nitrogen	1.24e-002	5.57e-001
Methane	2.03e+000	9.10e+001
Ethane	4.30e-001	1.93e+001
Propane	1.17e-001	5.25e+000
Isobutane	2.31e-002	1.03e+000
n-Butane	2.90e-002	1.30e+000
Isopentane	9.85e-003	4.41e-001
n-Pentane	5.64e-003	2.53e-001

Cyclopentane	7.26e-004	3.25e-002
n-Hexane	2.49e-003	1.12e-001
Cyclohexane	1.48e-003	6.61e-002
Other Hexanes	6.86e-003	3.07e-001
Heptanes	7.10e-003	3.18e-001
Methylcyclohexane	1.91e-003	8.54e-002
2,2,4-Trimethylpentane	2.33e-004	1.04e-002
Benzene	5.96e-003	2.67e-001
Toluene	2.10e-002	9.41e-001
Ethylbenzene	1.64e-002	7.35e-001
Xylenes	2.32e-002	1.04e+000
C8+ Heavies	8.55e-003	3.83e-001
Total Components	100.00	4.47e+003

FLASH TANK OFF GAS STREAM

Temperature: 75.00 deg. F
Pressure: 84.70 psia
Flow Rate: 2.43e+003 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	5.05e-002	5.82e-002
Carbon Dioxide	3.41e-001	9.62e-001
Nitrogen	3.07e-001	5.50e-001
Methane	8.75e+001	8.99e+001
Ethane	9.50e+000	1.83e+001
Propane	1.64e+000	4.63e+000
Isobutane	2.26e-001	8.40e-001
n-Butane	2.64e-001	9.81e-001
Isopentane	6.79e-002	3.13e-001
n-Pentane	3.56e-002	1.64e-001
Cyclopentane	2.39e-003	1.07e-002
n-Hexane	9.57e-003	5.28e-002
Cyclohexane	2.23e-003	1.20e-002
Other Hexanes	3.08e-002	1.70e-001
Heptanes	1.37e-002	8.78e-002
Methylcyclohexane	1.81e-003	1.14e-002
2,2,4-Trimethylpentane	6.44e-004	4.71e-003
Benzene	1.12e-003	5.60e-003
Toluene	1.84e-003	1.09e-002
Ethylbenzene	6.23e-004	4.23e-003
Xylenes	5.53e-004	3.76e-003
C8+ Heavies	1.71e-003	1.87e-002
Total Components	100.00	1.17e+002

FLASH TANK GLYCOL STREAM

Temperature: 75.00 deg. F
Flow Rate: 7.77e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.54e+001	4.16e+003
Water	4.43e+000	1.93e+002
Carbon Dioxide	5.07e-003	2.21e-001

Nitrogen	1.50e-004	6.55e-003
Methane	2.58e-002	1.13e+000
Ethane	2.18e-002	9.51e-001
Propane	1.42e-002	6.19e-001
Isobutane	4.44e-003	1.93e-001
n-Butane	7.24e-003	3.15e-001
Isopentane	2.92e-003	1.27e-001
n-Pentane	2.03e-003	8.84e-002
Cyclopentane	5.00e-004	2.18e-002
n-Hexane	1.35e-003	5.88e-002
Cyclohexane	1.24e-003	5.41e-002
Other Hexanes	3.14e-003	1.37e-001
Heptanes	5.28e-003	2.30e-001
Methylcyclohexane	1.70e-003	7.40e-002
2,2,4-Trimethylpentane	1.31e-004	5.70e-003
Benzene	5.99e-003	2.61e-001
Toluene	2.13e-002	9.30e-001
Ethylbenzene	1.68e-002	7.31e-001
Xylenes	2.37e-002	1.03e+000
C8+ Heavies	8.35e-003	3.64e-001
Total Components	100.00	4.36e+003

FLASH GAS EMISSIONS

Flow Rate: 7.60e+003 scfh
Control Method: Combustion Device
Control Efficiency: 93.00

Component	Conc. (vol%)	Loading (lb/hr)
Water	6.36e+001	2.29e+002
Carbon Dioxide	3.41e+001	3.01e+002
Nitrogen	9.82e-002	5.50e-001
Methane	1.96e+000	6.29e+000
Ethane	2.13e-001	1.28e+000
Propane	3.67e-002	3.24e-001
Isobutane	5.05e-003	5.88e-002
n-Butane	5.90e-003	6.87e-002
Isopentane	1.52e-003	2.19e-002
n-Pentane	7.96e-004	1.15e-002
Cyclopentane	5.35e-005	7.50e-004
n-Hexane	2.14e-004	3.70e-003
Cyclohexane	4.99e-005	8.41e-004
Other Hexanes	6.90e-004	1.19e-002
Heptanes	3.06e-004	6.14e-003
Methylcyclohexane	4.05e-005	7.96e-004
2,2,4-Trimethylpentane	1.44e-005	3.30e-004
Benzene	2.51e-005	3.92e-004
Toluene	4.12e-005	7.60e-004
Ethylbenzene	1.39e-005	2.96e-004
Xylenes	1.24e-005	2.63e-004
C8+ Heavies	3.83e-005	1.31e-003
Total Components	100.00	5.38e+002

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
Pressure: 14.70 psia
Flow Rate: 2.80e+003 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	9.77e+001	1.30e+002
Carbon Dioxide	6.81e-002	2.21e-001
Nitrogen	3.17e-003	6.55e-003
Methane	9.53e-001	1.13e+000
Ethane	4.29e-001	9.51e-001
Propane	1.91e-001	6.19e-001
Isobutane	4.51e-002	1.93e-001
n-Butane	7.37e-002	3.15e-001
Isopentane	2.37e-002	1.26e-001
n-Pentane	1.65e-002	8.76e-002
Cyclopentane	4.19e-003	2.16e-002
n-Hexane	9.20e-003	5.84e-002
Cyclohexane	8.40e-003	5.21e-002
Other Hexanes	2.12e-002	1.35e-001
Heptanes	3.10e-002	2.29e-001
Methylcyclohexane	9.79e-003	7.08e-002
2,2,4-Trimethylpentane	6.65e-004	5.59e-003
Benzene	4.31e-002	2.48e-001
Toluene	1.26e-001	8.56e-001
Ethylbenzene	8.37e-002	6.54e-001
Xylenes	1.15e-001	9.00e-001
C8+ Heavies	2.55e-002	3.20e-001
Total Components	100.00	1.37e+002

COMBUSTION DEVICE OFF GAS STREAM

Temperature: 1000.00 deg. F
Pressure: 14.70 psia
Flow Rate: 4.32e+000 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Methane	4.31e+001	7.88e-002
Ethane	1.94e+001	6.66e-002
Propane	8.62e+000	4.33e-002
Isobutane	2.04e+000	1.35e-002
n-Butane	3.33e+000	2.21e-002
Isopentane	1.07e+000	8.83e-003
n-Pentane	7.45e-001	6.13e-003
Cyclopentane	1.90e-001	1.51e-003
n-Hexane	4.16e-001	4.09e-003
Cyclohexane	3.80e-001	3.65e-003
Other Hexanes	9.60e-001	9.43e-003
Heptanes	1.40e+000	1.60e-002
Methylcyclohexane	4.43e-001	4.96e-003
2,2,4-Trimethylpentane	3.01e-002	3.92e-004
Benzene	1.95e+000	1.73e-002
Toluene	5.71e+000	5.99e-002
Ethylbenzene	3.79e+000	4.58e-002
Xylenes	5.21e+000	6.30e-002
C8+ Heavies	1.15e+000	2.24e-002

Total Components	100.00	4.88e-001

Certificate of Analysis

Number: 2030-14120043-001A

Carencro Laboratory
4790 NE Evangeline Thruway
Carencro, LA 70520

Gary Vermillion
Gas Analytical Services
PO Box 1028
Bridgeport, WV 26330

Dec. 08, 2014

Field: EQT
Station Name: Big 57 Dehy Inlet
Sample Point: Wellhead
Cylinder No: 0421
Analyzed: 12/03/2014 06:53:38 by GR2

Sampled By: CD-GAS
Sample Of: Gas Spot
Sample Date: 11/20/2014 10:30
Sample Conditions: 60 psig
Method: GPA 2286

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.73 psia		
Nitrogen	0.311	0.489		GPM TOTAL C2+	2.662
Carbon Dioxide	0.168	0.415		GPM TOTAL C3+	0.495
Methane	89.740	80.772		GPM TOTAL iC5+	0.042
Ethane	8.085	13.640	2.167		
Propane	1.252	3.097	0.346		
Iso-Butane	0.160	0.522	0.052		
n-Butane	0.173	0.564	0.055		
Iso-Pentane	0.047	0.190	0.017		
n-Pentane	0.023	0.093	0.008		
Hexanes	0.027	0.110	0.009		
Heptanes Plus	0.014	0.108	0.008		
	100.000	100.000	2.662		

Physical Properties	**Total**	**C7+**
Relative Density Real Gas	0.6167	3.6690
Calculated Molecular Weight	17.82	106.26
Compressibility Factor	0.9975	
GPA 2172-09 Calculation:		
Calculated Gross BTU per ft³ @ 14.73 psia & 60°F		
Real Gas Dry BTU	1102	5689
Water Sat. Gas Base BTU	1083	5590

Comments: H2O Mol% : 1.740 ; Wt% : 1.759

Patti L. Pecoro

Hydrocarbon Laboratory Manager

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

Certificate of Analysis

Number: 2030-14120043-001A

Carencro Laboratory
4790 NE Evangeline Thruway
Carencro, LA 70520

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Gas Analytical Services
PO Box 1028
Bridgeport, WV 26330

Dec. 08, 2014

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Station Name: Big 57 Dehy Inlet
Sample Point: Wellhead
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Sampled By: CD-GAS
Sample Of: Gas Spot
Sample Date: 11/20/2014 10:30
Sample Conditions: 60 psig
Method: GPA 2286

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.73 psia		
Nitrogen	0.311	0.489		GPM TOTAL C2+	2.662
Carbon Dioxide	0.168	0.415		GPM TOTAL C3+	0.495
Methane	89.740	80.772		GPM TOTAL iC5+	0.042
Ethane	8.085	13.640	2.167		
Propane	1.252	3.097	0.346		
Iso-butane	0.160	0.522	0.052		
n-Butane	0.173	0.564	0.055		
Iso-pentane	0.047	0.190	0.017		
n-Pentane	0.023	0.093	0.008		
Hexanes Plus	0.041	0.218	0.017		
	100.000	100.000	2.662		

Physical Properties	**Total**	**C6+**
Relative Density Real Gas	0.6167	3.2714
Calculated Molecular Weight	17.82	94.75
Compressibility Factor	0.9975	
GPA 2172-09 Calculation:		
Calculated Gross BTU per ft³ @ 14.73 psia & 60°F		
Real Gas Dry BTU	1102	5148
Water Sat. Gas Base BTU	1083	5059

Comments: H2O Mol% : 1.740 ; Wt% : 1.758

Patti L. Pecoraro

Hydrocarbon Laboratory Manager

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Certificate of Analysis

Number: 2030-14120043-001A

Carencro Laboratory
4790 NE Evangeline Thruway
Carencro, LA 70520

Gary Vermillion
Gas Analytical Services
PO Box 1028
Bridgeport, WV 26330

Dec. 08, 2014

Field: EQT
Station Name: Big 57 Dehy Inlet
Sample Point: Wellhead
Cylinder No: 0421
Analyzed: 12/03/2014 06:53:38 by GR2

Sampled By: CD-GAS
Sample Of: Gas Spot
Sample Date: 11/20/2014 10:30
Sample Conditions: 60 psig
Method: GPA 2286

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.73 psia
Nitrogen	0.311	0.489	
Methane	89.740	80.772	
Carbon Dioxide	0.168	0.415	
Ethane	8.085	13.640	2.167
Propane	1.252	3.097	0.346
Iso-Butane	0.160	0.522	0.052
n-Butane	0.173	0.564	0.055
Iso-Pentane	0.047	0.190	0.017
n-Pentane	0.023	0.093	0.008
i-Hexanes	0.021	0.086	0.007
n-Hexane	0.006	0.024	0.002
Benzene	NIL	0.001	NIL
Cyclohexane	0.001	0.004	NIL
i-Heptanes	0.008	0.041	0.003
n-Heptane	0.001	0.007	0.001
Toluene	0.001	0.003	NIL
i-Octanes	0.002	0.023	0.002
n-Octane	NIL	0.002	NIL
Ethylbenzene	NIL	NIL	NIL
Xylenes	NIL	0.004	NIL
i-Nonanes	NIL	0.007	0.001
n-Nonane	NIL	0.002	NIL
i-Decanes	0.001	0.009	0.001
n-Decane	NIL	NIL	NIL
Undecanes	NIL	0.005	NIL
Dodecanes	NIL	NIL	NIL
Tridecanes	NIL	NIL	NIL
Tetradecanes Plus	NIL	NIL	NIL
	100.000	100.000	2.662

GPM TOTAL C2+ 2.662

Physical Properties	**Total**
Calculated Molecular Weight	17.824
GPA 2172-09 Calculation:	
Calculated Gross BTU per ft³ @ 14.73 psia & 60°F	
Real Gas Dry BTU	1102.0
Water Sat. Gas Base BTU	1082.8
Relative Density Real Gas	0.6167
Compressibility Factor	0.9975

Hydrocarbon Laboratory Manager

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Dec. 08, 2014

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Station Name: Big 57 Dehy Inlet
Sample Point: Wellhead
Cylinder No: 0421
Analyzed: 12/03/2014 06:53:38 by GR2

Sampled By: CD-GAS
Sample Of: Gas Spot
Sample Date: 11/20/2014 10:30
Sample Conditions: 60 psig
Method: GPA 2286

Analytical Data

Components	Mol. %	Wt. %
Carbon Dioxide	0.168	0.415
Hydrogen Sulfide	N/R	N/R
Nitrogen	0.311	0.489
Methane	89.740	80.774
Ethane	8.085	13.640
Propane	1.252	3.098
Iso-Butane	0.160	0.522
n-Butane	0.173	0.564
Iso-Pentane	0.047	0.190
n-Pentane	0.023	0.093
Cyclopentane	0.001	0.005
n-Hexane	0.006	0.023
Cyclohexane	0.001	0.004
Other Hexanes	0.020	0.081
n-Heptane	0.001	0.007
Other Heptanes	0.008	0.041
Methylcyclohexane	0.001	0.007
2,2,4-Trimethylpentane	NIL	NIL
Benzene	NIL	0.001
Toluene	0.001	0.003
Ethylbenzene	NIL	NIL
Xylenes	NIL	0.004
C8 + Heavies	0.002	0.039
	100.000	100.000

Hydrocarbon Laboratory Manager

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

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 new natural gas production wellpad. The facility will be located along Brink Road (Co. Rt. 1) in Marion County approximately eight miles northwest of Mannington, WV at 39.563980°, -80.489581°.

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

Pollutant	Emissions (tons per year)
NO_X	9.14
CO	7.68
VOC	12.82
SO_2	0.05
PM	2.77
Total HAPs	1.05
Carbon Dioxide Equivalents (CO_2e)	13,722

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 October, 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		
E001 – E010, E026 (Each Tank)	Upward vertical stack	S001 – S010, S026	Produced Fluid Storage Tanks & Dehy Drip Tank	None	---	VOC HAPs	0.05 <0.01	0.20 <0.01	0.05 <0.01	0.20 <0.01	Gas/Vapor	E&P Tank v2.0
E011	Upward vertical stack	S011	Sand Separator Tank	None	---	VOC HAPS	<0.01 <0.01	0.02 <0.01	<0.01 <0.01	0.02 <0.01	Gas/Vapor	E&P Tank v2.0
E012 – E020 (Each unit)	Upward vertical stack	S012 – S020	Line Heaters	None	---	NO_X CO $PM/PM_{10}/PM_{2.5}$ SO_2 VOC CO_{2e} HAPs	0.14 0.12 0.01 <0.01 0.01 180.18 <0.01	0.61 0.51 0.05 <0.01 0.03 789.20 0.01	0.14 0.12 0.01 <0.01 0.01 180.18 <0.01	0.61 0.51 0.05 <0.01 0.03 789.20 0.01	Gas/Vapor	AP-42
E021 – E023 (Total – All units)	Upward vertical stack	S021 – S023	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 5 <0.01	0.02 0.01 <0.01 <0.01 <0.01 20 <0.01	<0.01 <0.01 <0.01 <0.01 <0.01 5 <0.01	0.02 0.01 <0.01 <0.01 <0.01 20 <0.01	Gas/Vapor	AP-42
E025	Upward vertical stack	S025	Reboiler	None	---	NO_X CO $PM/PM_{10}/PM_{2.5}$ SO_2 VOC CO_{2e} HAPs	0.07 0.06 0.01 <0.01 <0.01 88 <0.01	0.30 0.25 0.02 <0.01 0.02 385 0.01	0.07 0.06 0.01 <0.01 <0.01 88 <0.01	0.30 0.25 0.02 <0.01 0.02 385 0.01	Gas/Vapor	AP-42
E027	Upward vertical stack	S027	Liquid Loading	None	---	VOC HAPs	0.22 0.01	0.96 0.02	0.22 0.01	0.96 0.02	Gas/Vapor	AP-42
C001	Upward vertical stack	S024, C001	TEG Dehydration Unit, Combustor	NA	---	NO_X CO $PM/PM_{10}/PM_{2.5}$ SO_2 VOC CO_{2e} HAPs	0.76 0.64 0.06 <0.01 12.26 3,255 2.80	3.32 2.79 0.25 0.02 53.69 14,257 12.28	0.76 0.64 0.06 <0.01 0.90 1,445 0.20	3.32 2.79 0.25 0.02 3.93 4,991 0.86	Gas/Vapor	GRI GLYCalc, 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, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. **DO NOT LIST** H_2, H_2O, N_2, O_2, 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).