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TEL: (412) 395-3699
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R. Alex Bosiljevac
Environmental Coordinator

August 17, 2016

CERTIFIED MAIL # 7015 1660 0000 9339 6437

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
Permit No: G70-A188
GLO-76 Natural Gas Production Site

Dear Mr. Durham,

Enclosed are two electronic copies and one original hard copy of a proposed G70-C 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,

RAB

R. Alex Bosiljevac
EQT Corporation

Enclosures

PROJECT REPORT

EQT Production
GLO-76 Pad

G70-C Permit Application

Where energy meets innovation.

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

August 2016

Trinity Consultants

Environmental solutions delivered uncommonly well

TABLE OF CONTENTS

EQT Production Company (EQT) is submitting this Class II General Permit (G70-C) application to the West Virginia Department of Environmental Protection (WVDEP) for the GLO-76 pad, an existing production well pad, located in Marion County, West Virginia. The GLO-76 is currently operating under G70-A permit number G70-A188. This general permit application is to convert the permit to a G70-C and for the replacement of combustor C001, which has a maximum design capacity of 93 scf/min, for a combustor that has a maximum design capacity of 3.33 MMBtu/hr.

1.1. FACILITY AND PROJECT DESCRIPTION

The GLO-76 pad is a natural gas production facility consists 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 does not produce condensate.

This application seeks to continue authorization for the following existing equipment at the GLO-76 pad under the G70-C permit:

- 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), and enclosed combustor (rated 8.33 MMBtu/hr). The dehy is 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.

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

- Once (1) enclosed combustor rated at 3.33 MMBtu/hr for control of the dehydration unit. This unit will replace the existing combustor

EQT would also like to note that, although included in the original permit application, the dehy drip fluid tank (S-026) was not included in the current G70-A permit. EQT is requesting that this tank be listed in the issued G70-C permit.

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

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

Pollutant	Wellpad Potential Annual Emissions (tpy)	G70-C Maximum Annual Emission Limits (tpy)
Nitrogen Oxides	7.15	50
Carbon Monoxide	6.01	80
Volatile Organic Compounds	16.09	80
Particulate Matter – 10/2.5	1.07	20
Sulfur Dioxide	0.04	20
Individual HAP (n-hexane)[1]	0.21	8
Total HAP[1]	0.49	20

1. Includes fugitive emissions

1.2. SOURCE STATUS

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

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

Other additional pollutant emitting facilities should be aggregated with the 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-76 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-C APPLICATION ORGANIZATION

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

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

The characteristics of air emissions from the 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 S 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] Pneumatic devices at the wellpad are intermittent bleed and are assumed to be in operation 1/3 of the year.

- **Storage Tanks:** Working, breathing and flashing emissions of VOC and HAPs from the 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.

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[1]6**********
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$$Throughput\ per\ Tank\ \left(\frac{bbl}{day}\right) = \frac{\left(Condensate\ Throughput\ \left(\frac{bbl}{month}\right) + \left(Produced\ Water\ Throughput\ \left(\frac{bbl}{month}\right) * 1\%\ (Condensate\ in\ Produced\ Water)\right) * \frac{12\left(\frac{months}{year}\right)}{365\left(\frac{days}{year}\right)}\right)}{Number\ of\ tanks\ at\ wellpad}$$

- **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 98% (100% capture, 98% destruction) from the combustor.

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

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

This review is presented to supplement and/or add clarification to the information provided in the WVDEP G70-C 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 permitting 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

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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 and on or before September 18, 2015. The GLO-76 wellpad does not include any equipment which falls into this date range; therefore, this subpart is not applicable to this permitting activity.

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

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

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

There are 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-C permit. As such, per 60.5365a(e), the tanks are not storage vessel affected facilities under the rule.

As the collection of fugitive emissions components at the well site commenced construction after September 18, 2015, the well site will be subject to the leak detection and repair (LDAR) requirements of the rule. This includes developing an emissions monitoring plan, conducting leak surveys (on a semi-annual basis) and associated repair activities, and maintaining records and submitting annual reports in accordance with the requirements of the rule.

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

3.3.5. 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-C APPLICATION FORMS

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

west virginia department of environmental protection

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

G70-C GENERAL PERMIT REGISTRATION APPLICATION

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

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

SECTION 1. GENERAL INFORMATION

Name of Applicant (as registered with the WV Secretary of State's Office): EQT Production Company

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

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

City: Pittsburgh	State: PA	ZIP Code: 15222

Facility Name: GLO-76 Wellpad

Operating Site Physical Address:
If none available, list road, city or town and zip of facility: Mannington, Marion County

City: Mannington	Zip Code:	County: Marion

Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits):
Latitude: 39.56398 N
Longitude: -80.48958 W

SIC Code: 1311 NAICS Code: 211111	DAQ Facility ID No. (For existing facilities) 049-00188

CERTIFICATION OF INFORMATION

This G70-C General Permit Registration Application shall be signed below by a Responsible Official. A Responsible Official is a President, Vice President, Secretary, Treasurer, General Partner, General Manager, a member of the Board of Directors, or Owner, depending on business structure. A business may certify an Authorized Representative who shall have authority to bind the Corporation, Partnership, Limited Liability Company, Association, Joint Venture or Sole Proprietorship. Required records of daily throughput, hours of operation and maintenance, general correspondence, compliance certifications and all required notifications must be signed by a Responsible Official or an Authorized Representative. If a business wishes to certify an Authorized Representative, the official agreement below shall be checked off and the appropriate names and signatures entered. **Any administratively incomplete or improperly signed or unsigned G70-C Registration Application will be returned to the applicant. Furthermore, if the G70-C forms are not utilized, the application will be returned to the applicant. No substitution of forms is allowed.**

I hereby certify that Kenneth Kirk is an Authorized Representative and in that capacity shall represent the interest of the business (e.g., Corporation, Partnership, Limited Liability Company, Association Joint Venture or Sole Proprietorship) and may obligate and legally bind the business. If the business changes its Authorized Representative, a Responsible Official shall notify the Director of the Division of Air Quality immediately.

I hereby certify that all information contained in this G70-C General Permit Registration Application and any supporting documents appended hereto is, to the best of my knowledge, true, accurate and complete, and that all reasonable efforts have been made to provide the most comprehensive information possible.

Responsible Official Signature: [signature] 4125535700
Name and Title: Kenneth Kirk, Executive Vice President — Phone: — Fax:
Email: KKirk@eqt.com — Date: 8/15/16

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

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

OPERATING SITE INFORMATION
Briefly describe the proposed new operation and/or any change(s) to the facility: General permit application for an existing natural gas production well pad. This application seeks to replace current combustor with a smaller one.
Directions to the facility: 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.

ATTACHMENTS AND SUPPORTING DOCUMENTS	
I have enclosed the following required documents:	
Check payable to WVDEP – Division of Air Quality with the appropriate application fee (per 45CSR13 and 45CSR22). ☐ Check attached to front of application. ☐ I wish to pay by electronic transfer. Contact for payment (incl. name and email address): ☒ I wish to pay by credit card. Contact for payment (incl. name and email address): R. Alex Bosiljevac, abosiljevac@eqt.com ☐$500 (Construction, Modification, and Relocation) ☒$300 (Class II Administrative Update) ☐$1,000 NSPS fee for 40 CFR60, Subpart IIII, JJJJ and/or OOOO [1] ☐$2,500 NESHAP fee for 40 CFR63, Subpart ZZZZ and/or HH [2] [1] Only one NSPS fee will apply. [2] Only one NESHAP fee will apply. The Subpart ZZZZ NESHAP fee will be waived for new engines that satisfy requirements by complying with NSPS, Subparts IIII and/or JJJJ. *NSPS and NESHAP fees apply to new construction or if the source is being modified.*	
☒ Responsible Official or Authorized Representative Signature (if applicable)	
☒ Single Source Determination Form **(must be completed in its entirety)** – Attachment A	
☐ Siting Criteria Waiver (if applicable) – Attachment B	☒ Current Business Certificate – Attachment C
☒ Process Flow Diagram – Attachment D	☒ Process Description – Attachment E
☒ Plot Plan – Attachment F	☒ Area Map – Attachment G
☒ G70-C Section Applicability Form – Attachment H	☒ Emission Units/ERD Table – Attachment I
☒ Fugitive Emissions Summary Sheet – Attachment J	
☒ Gas Well Affected Facility Data Sheet (if applicable) – Attachment K	
☒ Storage Vessel(s) Data Sheet (include gas sample data, USEPA Tanks, simulation software (e.g. ProMax, E&P Tanks, HYSYS, etc.), etc. where applicable) – Attachment L	
☒ Natural Gas Fired Fuel Burning Unit(s) Data Sheet (GPUs, Heater Treaters, In-Line Heaters if applicable) – Attachment M	
☐ Internal Combustion Engine Data Sheet(s) (include manufacturer performance data sheet(s) if applicable) – Attachment N	
☒ Tanker Truck Loading Data Sheet (if applicable) – Attachment O	
☒ Glycol Dehydration Unit Data Sheet(s) (include wet gas analysis, GRI- GLYCalc™ input and output reports and information on reboiler if applicable) – Attachment P	
☐ Pneumatic Controllers Data Sheet – Attachment Q	
☒ Air Pollution Control Device/Emission Reduction Device(s) Sheet(s) (include manufacturer performance data sheet(s) if applicable) – Attachment R	
☒ Emission Calculations (please be specific and include all calculation methodologies used) – Attachment S	
☒ Facility-wide Emission Summary Sheet(s) – Attachment T	
☒ Class I Legal Advertisement – Attachment U	
☒ One (1) paper copy and two (2) copies of CD or DVD with pdf copy of application and attachments	

All attachments must be identified by name, divided into sections, and submitted in order.

ATTACHMENT A

Single Source Determination

ATTACHMENT A - SINGLE SOURCE DETERMINATION FORM

Classifying multiple facilities as one "stationary source" under 45CSR13, 45CSR14, and 45CSR19 is based on the definition of Building, structure, facility, or installation as given in §45-14-2.13 and §45-19-2.12. The definition states:

"Building, Structure, Facility, or Installation" means all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control). Pollutant-emitting activities are a part of the same industrial grouping if they belong to the same "Major Group" (i.e., which have the same two (2)-digit code) as described in the Standard Industrial Classification Manual, 1987 (United States Government Printing Office stock number GPO 1987 0-185-718:QL 3).

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

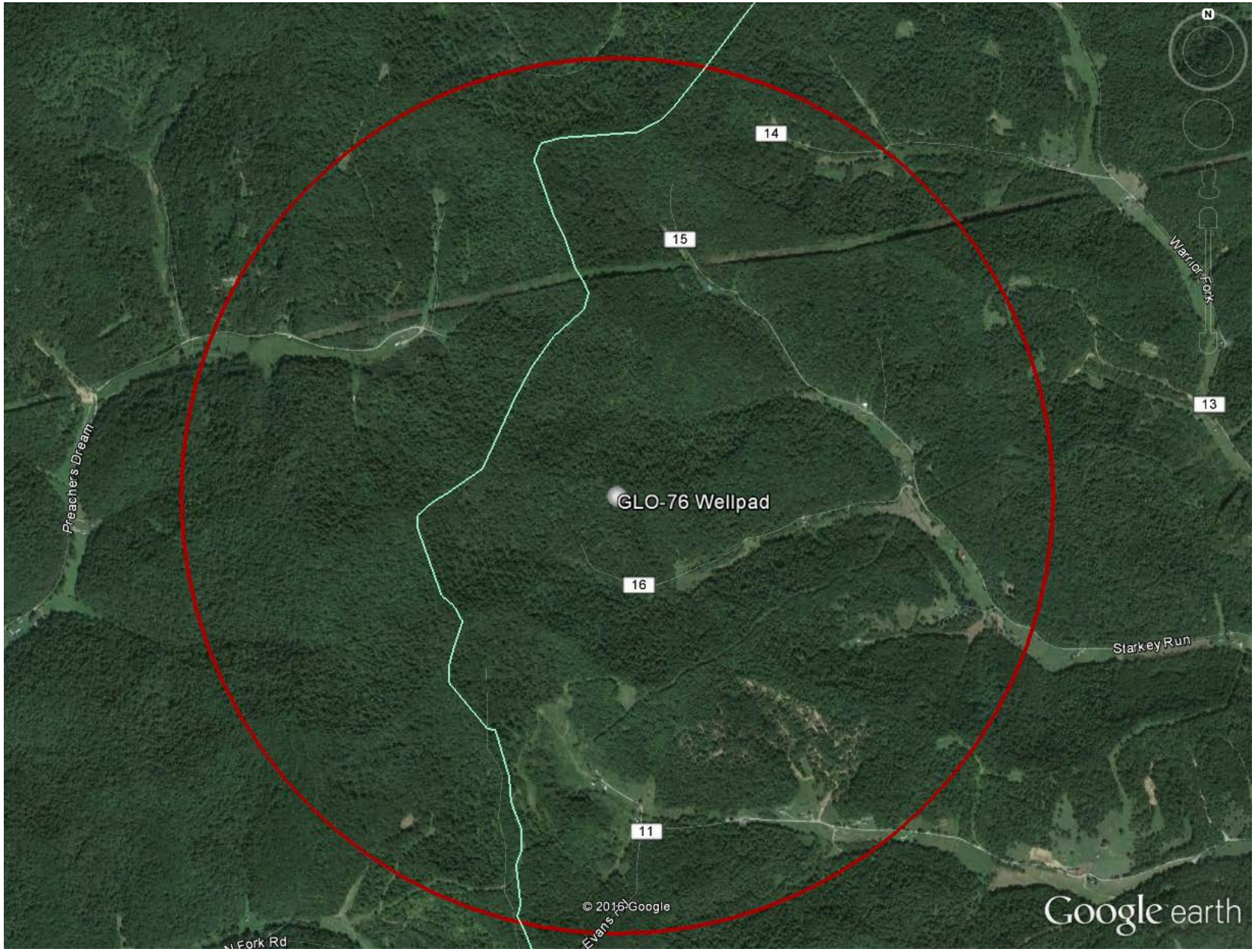
If Yes, please complete the questionnaire on the following page (Attachment A).

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

Please see discussion in the Application Report.

ATTACHMENT A - SINGLE SOURCE DETERMINATION FORM – NOT APPLICABLE	
Answer each question with a detailed explanation to determine contiguous or adjacent properties which are under a common control and any support facilities. This section must be completed in its entirety.	
Provide a map of contiguous or adjacent facilities (production facilities, compressor stations, dehydration facilities, etc.) which are under common control and those facilities that are not under common control but are support facilities. Please indicate the SIC code, permit number (if applicable), and the distance between facilities in question on the map.	
Are the facilities owned by the same parent company or a subsidiary of the parent company? Provide the owners identity and the percentage of ownership of each facility.	Yes ☐ No ☐
Does an entity such as a corporation have decision making authority over the operation of a second entity through a contractual agreement or voting interest? Please explain.	Yes ☐ No ☐
Is there a contract for service relationship between the two (2) companies or, a support/dependency relationship that exists between the two (2) companies? Please explain.	Yes ☐ No ☐
Do the facilities share common workforces, plant managers, security forces, corporate executive officers or board executives?	Yes ☐ No ☐
Will managers or other workers frequently shuttle back and forth to be involved actively at both facilities?	Yes ☐ No ☐
Do the facilities share common payroll activities, employee benefits, health plans, retirement funds, insurance coverage, or other administrative functions? Please explain.	Yes ☐ No ☐
Does one (1) facility operation support the operation of the other facility?	Yes ☐ No ☐
Is one (1) facility dependent on the other? If one (1) facility shuts down, what are the limitations on the other to pursue outside business? Please explain.	Yes ☐ No ☐
Are there any financial arrangements between the two (2) entities?	Yes ☐ No ☐
Are there any legal or lease agreements between the two (2) facilities?	Yes ☐ No ☐
Do the facilities share products, byproducts, equipment, or other manufacturing or air pollution control device equipment? Please explain.	Yes ☐ No ☐
Do all the pollutant-emitting activities at the facilities belong to the same SIC Code? Please provide the SIC Codes.	Yes ☐ No ☐
Was the location of the new facility chosen primarily because of its proximity to the existing facility to integrate the operation of the two (2) facilities? Please explain.	Yes ☐ No ☐
Will materials be routinely transferred between the two (2) facilities? Please explain the amount of transfer and how often the transfers take place and what percentages go to the various entities.	Yes ☐ No ☐
Does the facility influence production levels or compliance with environmental regulations at other facilities? Who accepts the responsibility for compliance with air quality requirements? Please explain.	Yes ☐ No ☐

ATTACHMENT A: SINGLE SOURCE DETERMINATION MAP



Note – red ring is a 1-mile radius from GLO-76

ATTACHMENT B

Siting Criteria Waiver *(Not Applicable)*

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

G70-C General Permit
Siting Criteria Waiver

WV Division of Air Quality 300' Waiver

I _____ hereby
Print Name

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

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

.

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

Signed:

_____

Signature Date

_____

Signature Date

Taken, subscribed and sworn before me this _____ day of

_____, 20_____.

My commission expires: _____

SEAL_____
Notary Public

ATTACHMENT C

Business Certificate

WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION CERTIFICATE

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

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

This certificate is issued on: 08/4/2010

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

The person or organization identified on this certificate is registered to conduct business in the State of West Virginia at the location above.

This certificate is not transferrable and must be displayed at the location for which issued.

This certificate shall be permanent until cessation of the business for which the certificate of registration was granted or until it is suspended, revoked or cancelled by the Tax Commissioner.

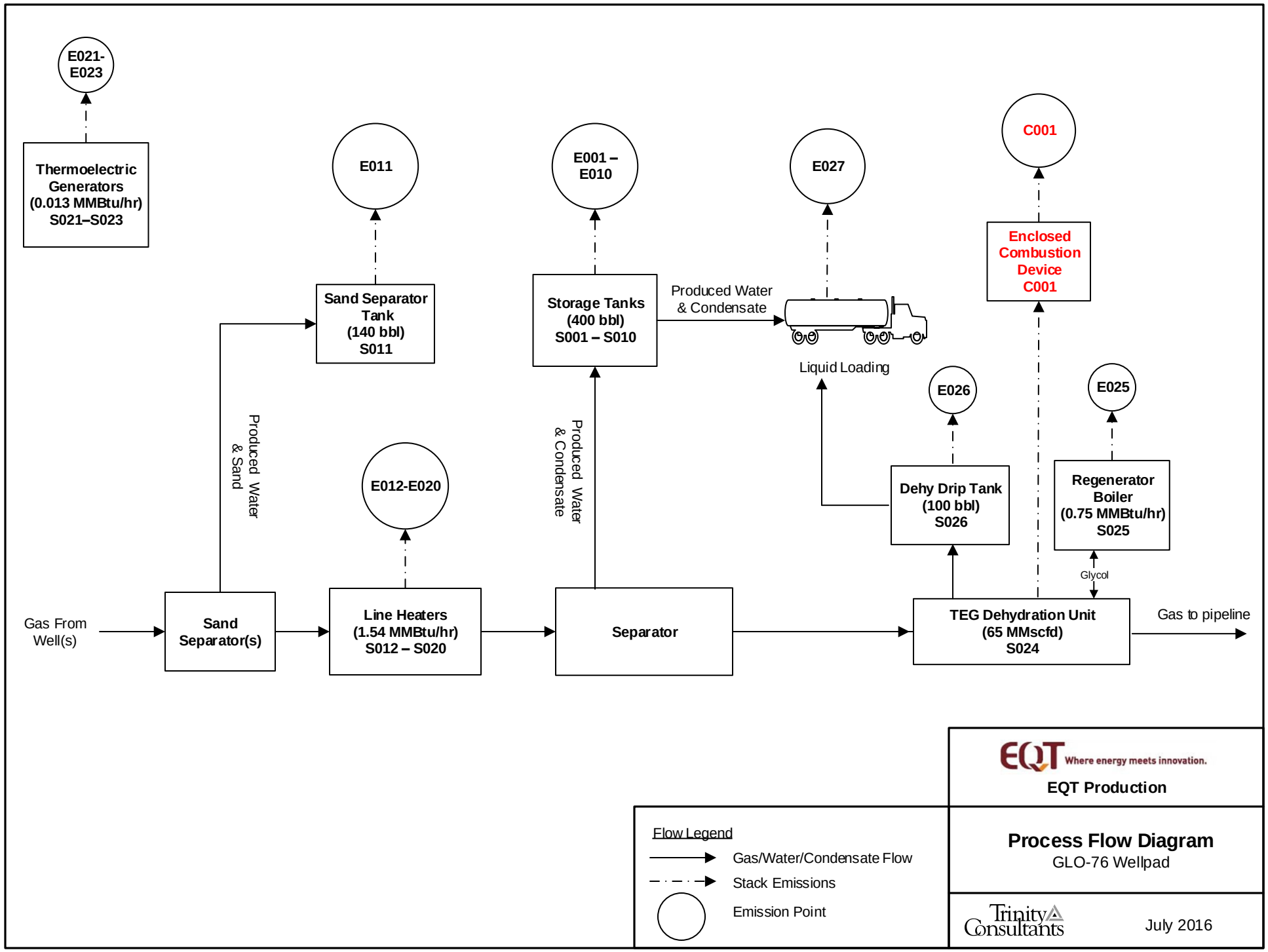
Change in name or change of location shall be considered a cessation of the business and a new certificate shall be required.

TRAVELING/STREET VENDORS: Must carry a copy of this certificate in every vehicle operated by them. CONTRACTORS, DRILLING OPERATORS, TIMBER/LOGGING OPERATIONS: Must have a copy of this certificate displayed at every job site within West Virginia.

atL006 v.3
L0553297664

ATTACHMENT D

Process Flow Diagram


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
July 2016

ATTACHMENT E

Process Description

ATTACHMENT E: PROCESS DESCRIPTION

EQT is submitting the application to replace the existing 36" combustor associated with the triethylene glycol (TEG) dehydration unit at the wellpad with a 24" combustor. Additionally, this application seeks to convert the current General Permit G70-A188 to the G-70C.

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 F

Plot Plan

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

Entrance to GLO-76 pad

Tanks
400 bbl each
(10)

Sand
Separator
Tank
140 bbl
(1)

Wellheads
(9)

Tri-ethylene Glycol Dehy
(1)

Dehy Drip Tank
100 bbl
(1)

Thermoelectric Generators
(24V)

Line Heaters
(9)

Combustor
3.33
MMBTU/hr

ATTACHMENT F
GLO-76 Well Pad Plot Plan

ATTACHMENT G

Area Map

ATTACHMENT G: AREA MAP

Figure 1 - Map of GLO-76 Location

UTM Northing (KM):	4,337.873
UTM Easting (KM):	515.746
Elevation:	~1,114 ft

ATTACHMENT H

Applicability Form

ATTACHMENT H – G70-C SECTION APPLICABILITY FORM

General Permit G70-C Registration
Section Applicability Form

General Permit G70-C was developed to allow qualified applicants to seek registration for a variety of sources. These sources include gas well affected facilities, storage vessels, gas production units, in-line heaters, heater treaters, glycol dehydration units and associated reboilers, pneumatic controllers, centrifugal compressors, reciprocating compressors, reciprocating internal combustion engines (RICEs), tank truck loading, fugitive emissions, completion combustion devices, flares, enclosed combustion devices, and vapor recovery systems. All registered facilities will be subject to Sections 1.0, 2.0, 3.0, and 4.0.

General Permit G70-C allows the registrant to choose which sections of the permit they are seeking registration under. Therefore, please mark which additional sections that you are applying for registration under. If the applicant is seeking registration under multiple sections, please select all that apply. Please keep in mind, that if this registration is approved, the issued registration will state which sections will apply to your affected facility.

GENERAL PERMIT G70-C APPLICABLE SECTIONS	
☒ Section 5.0	Gas Well Affected Facility (NSPS, Subpart OOOO)
☒ Section 6.0	Storage Vessels Containing Condensate and/or Produced Water[1]
☐ Section 7.0	Storage Vessel Affected Facility (NSPS, Subpart OOOO)
☒ Section 8.0	Control Devices and Emission Reduction Devices not subject to NSPS Subpart OOOO and/or NESHAP Subpart HH
☒ Section 9.0	Small Heaters and Reboilers not subject to 40CFR60 Subpart Dc
☐ Section 10.0	Pneumatic Controllers Affected Facility (NSPS, Subpart OOOO)
☐ Section 11.0	Centrifugal Compressor Affected Facility (NSPS, Subpart OOOO)[2]
☐ Section 12.0	Reciprocating Compressor Affected Facility (NSPS, Subpart OOOO)[2]
☐ Section 13.0	Reciprocating Internal Combustion Engines, Generator Engines, Microturbines
☒ Section 14.0	Tanker Truck Loading[3]
☒ Section 15.0	Glycol Dehydration Units[4]

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

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

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

4 *Applicants that are subject to Section 15 may also be subject to the requirements of Section 9 (reboilers). Applicants that are subject to Section 15 may also be subject to control device and emission reduction device requirements of Section 8.*

ATTACHMENT I

Emission Units Table

ATTACHMENT I – EMISSION UNITS / EMISSION REDUCTION DEVICES (ERD) TABLE

Include ALL emission units and air pollution control devices/ERDs that will be part of this permit application review. Do not include fugitive emission sources in this table. Deminimis storage tanks shall be listed in the Attachment L table. This information is required for all sources regardless of whether it is a construction, modification, or administrative update.

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed	Manufac. Date[3]	Design Capacity	Type[4] and Date of Change	Control Device(s)[5]	ERD(s)[6]
S001	E001	Produced Fluid Storage Tank	2016	2016	400 bbl	Existing; No change	None	---
S002	E002	Produced Fluid Storage Tank	2016	2016	400 bbl	Existing; No change	None	---
S003	E003	Produced Fluid Storage Tank	2016	2016	400 bbl	Existing; No change	None	---
S004	E004	Produced Fluid Storage Tank	2016	2016	400 bbl	Existing; No change	None	---
S005	E005	Produced Fluid Storage Tank	2016	2016	400 bbl	Existing; No change	None	---
S006	E006	Produced Fluid Storage Tank	2016	2016	400 bbl	Existing; No change	None	---
S007	E007	Produced Fluid Storage Tank	2016	2016	400 bbl	Existing; No change	None	---
S008	E008	Produced Fluid Storage Tank	2016	2016	400 bbl	Existing; No change	None	---
S009	E009	Produced Fluid Storage Tank	2016	2016	400 bbl	Existing; No change	None	---
S010	E010	Produced Fluid Storage Tank	2016	2016	400 bbl	Existing; No change	None	---
S011	E011	Sand Separator Tank	2016	2016	140 bbl	Existing; No change	None	---
S012	E012	Line Heater	2016	2016	1.54 MMBtu/hr	Existing; No change	None	---
S013	E013	Line Heater	2016	2016	1.54 MMBtu/hr	Existing; No change	None	---
S014	E014	Line Heater	2016	2016	1.54 MMBtu/hr	Existing; No change	None	---
S015	E015	Line Heater	2016	2016	1.54 MMBtu/hr	Existing; No change	None	---
S016	E016	Line Heater	2016	2016	1.54 MMBtu/hr	Existing; No change	None	---
S017	E017	Line Heater	2016	2016	1.54 MMBtu/hr	Existing; No change	None	---
S018	E018	Line Heater	2016	2016	1.54 MMBtu/hr	Existing; No change	None	---
S019	E019	Line Heater	2016	2016	1.54 MMBtu/hr	Existing; No change	None	---

S020	E020	Line Heater	2016	2016	1.54 MMBtu/hr	Existing; No change	None	---
S021	E021	Thermoelectric Generator	2016	2016	0.013 MMBtu/hr	Existing; No change	None	---
S022	E022	Thermoelectric Generator	2016	2016	0.013 MMBtu/hr	Existing; No change	None	---
S023	E023	Thermoelectric Generator	2016	2016	0.013 MMBtu/hr	Existing; No change	None	---
S024	C001	Dehydration Unit	2016	2016	65 MMSCFD	Existing; No change	C001	---
S025	E025	Reboiler	2016	2016	0.75 MMBtu/hr	Existing; No change	None	---
S026	E026	Dehy Drip Tank	2016	2016	100 bbl	Existing; No change	None	---
S027	E027	Liquid Loading	2016	2016	9,972,333 Gal	Existing; No change	None	---
C001	C001	Combustor	TBD	TBD	3.33 MMBTU/hr	New (Replacement)	N/A	---

[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] When required by rule
[4] New, modification, removal, existing
[5] For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.
[6] For ERDs use the following numbering system: 1D, 2D, 3D,... or other appropriate designation.

ATTACHMENT J

Fugitive Emissions Summary Sheet

ATTACHMENT J – FUGITIVE EMISSIONS SUMMARY SHEET

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

Source/Equipment: Fugitive Emissions

Leak Detection Method Used	☐ Audible, visual, and olfactory (AVO) inspections	☐ Infrared (FLIR) cameras	☒ Other (please describe) Will satisfy condition 4.1.4. of the G70-C	☐ None required

Component Type	Closed Vent System	Count	Source of Leak Factors (EPA, other (specify))	Stream type (gas, liquid, etc.)	Estimated Emissions (tpy)		
					VOC	HAP	GHG (CO_2e)
Pumps	☐ Yes ☒ No	1	U.S. EPA. Office of Air Quality Planning and Standards. Protocol for Equipment Leak Emission Estimates. Table 2-1. (EPA-453/R-95-017, 1995).	☐ Gas ☒ Liquid ☐ Both	0.01	1.4E-04	---
Valves	☐ Yes ☒ No	485	U.S. EPA. Office of Air Quality Planning and Standards. Protocol for Equipment Leak Emission Estimates. Table 2-1. (EPA-453/R-95-017, 1995).	☒ Gas ☐ Liquid ☐ Both	2.03	0.02	54.48
Safety Relief Valves	☐ Yes ☒ No	51	U.S. EPA. Office of Air Quality Planning and Standards. Protocol for Equipment Leak Emission Estimates. Table 2-1. (EPA-453/R-95-017, 1995).	☒ Gas ☐ Liquid ☐ Both	3.73	0.04	8.49
Open Ended Lines	☐ Yes ☒ No	25	U.S. EPA. Office of Air Quality Planning and Standards. Protocol for Equipment Leak Emission Estimates. Table 2-1. (EPA-453/R-95-017, 1995).	☐ Gas ☐ Liquid ☒ Both	0.03	2.9E-4	6.34
Sampling Connections	☐ Yes ☐ No	---	N/A	☐ Gas ☐ Liquid ☐ Both	---	---	---
Connections (Not sampling)	☐ Yes ☒ No	2,028	U.S. EPA. Office of Air Quality Planning and Standards. Protocol for Equipment Leak Emission Estimates. Table 2-1. (EPA-453/R-95-017, 1995).	☐ Gas ☐ Liquid ☒ Both	2.61	0.03	25.31
Compressors	☐ Yes ☐ No	---	N/A	☐ Gas ☐ Liquid ☐ Both	---	---	---
Flanges	☐ Yes ☐ No	---	(included in connections)	☐ Gas ☐ Liquid ☐ Both	---	---	---
Other[1]	☐ Yes ☒ No	45	40 CFR 98 Subpart W	☒ Gas ☐ Liquid ☐ Both	3.03	0.03	842.45

[1] Other equipment types may include compressor seals, relief valves, diaphragms, drains, meters, etc.

Please provide an explanation of the sources of fugitive emissions (e.g. pigging operations, equipment blowdowns, pneumatic controllers, etc.):
Pneumatic Controller count is 'Other' category. An estimate of Miscellaneous Gas Venting emissions are included in the Emission Calculations and serve to include such sources as compressor venting, pigging, vessel blowdowns and other sources.

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

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

ATTACHMENT K

Gas Well Data Sheet

ATTACHMENT K – GAS WELL AFFECTED FACILITY DATA SHEET

Complete this data sheet if you are the owner or operator of a gas well affected facility for which construction, modification or reconstruction commenced after August 23, 2011. This form must be completed for natural gas well affected facilities regardless of when flowback operations occur (or have occurred).

API Number	Date of Flowback[1]	Date of Well Completion[2]	Green Completion and/or Combustion Device
47-049-02346	04/21/2016	03/16/2016	Green
47-049-02329	04/26/2016	03/27/2016	Green
47-049-02347	04/30/2016	03/25/2016	Green
47-049-02401	04/30/2016	03/30/2016	Green
47-049-02334	04/22/2016	03/21/2016	Green
47-049-02332	04/26/2016	04/02/2016	Green

Note: If future wells are planned and no API number is available please list as PLANNED.
If there are existing wells that commenced construction prior to August 23, 2011, please acknowledge as existing.

This is the same API (American Petroleum Institute) well number(s) provided in the well completion notification and as provided to the WVDEP, Office of Oil and Gas for the well permit. The API number may be provided on the application without the state code (047).

Every oil and gas well permitted in West Virginia since 1929 has been issued an API number. This API is used by agencies to identify and track oil and gas wells.

The API number has the following format: 047-001-00001

Where,

047 = State code. The state code for WV is 047.
001 = County Code. County codes are odd numbers, beginning with 001 (Barbour) and continuing to 109 (Wyoming).
00001= Well number. Each well will have a unique well number.

[1] Start date of well fluid flowback
[2] Start date of frac plug drill out

ATTACHMENT L

Storage Vessel Data Sheet

ATTACHMENT L – STORAGE VESSEL DATA SHEET

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

The following information is REQUIRED:

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

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

Additional information may be requested if necessary.

GENERAL INFORMATION (REQUIRED)

1. Bulk Storage Area Name GLO-76 Wellpad	2. Tank Name Produced Liquid Tanks
3. Emission Unit ID number S001-S010	4. Emission Point ID number E001-E010
5. Date Installed , Modified or Relocated *(for existing tanks)* Was the tank manufactured after August 23, 2011? ☒ Yes ☐ No	6. Type of change: none ☐ New construction ☐ New stored material ☐ Other (Low Pressure Tower) ☐ Relocation
7A. Description of Tank Modification *(if applicable)* N/A	
7B. Will more than one material be stored in this tank? *If so, a separate form must be completed for each material.* ☐ Yes ☒ No	
7C. Was USEPA Tanks simulation software utilized? ☐ Yes ☒ No ***If Yes, please provide the appropriate documentation and items 8-42 below are not required.***	

TANK INFORMATION

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

PRESSURE/VACUUM CONTROL DATA

19. Check as many as apply:

☐ Does Not Apply ☐ Rupture Disc (psig)

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

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

☒ Conservation Vent (psig) – Enardo Valve ☐ Condenser[1]

0.5 oz Vacuum Setting 12.5 oz Pressure Setting

☒ Emergency Relief Valve (psig)

Vacuum Setting 14.4 Pressure Setting

☐ Thief Hatch Weighted ☐ Yes ☒ No – Cashco Lockdown Hatch

[1] Complete appropriate Air Pollution Control Device Sheet

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

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

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

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

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

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 , Modified or Relocated *(for existing tanks)* Was the tank manufactured after August 23, 2011? ☒ Yes ☐ No	6. Type of change: ☐ New construction ☐ New stored material ☐ Other (Low Pressure Tower) ☐ Relocation
7A. Description of Tank Modification *(if applicable)* N/A	
7B. Will more than one material be stored in this tank? *If so, a separate form must be completed for each material.* ☐ Yes ☒ No	
7C. Was USEPA Tanks simulation software utilized? ☐ Yes ☒ No ***If Yes, please provide the appropriate documentation and items 8-42 below are not required.***	

TANK INFORMATION

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

PRESSURE/VACUUM CONTROL DATA

19. Check as many as apply:	
☒ Does Not Apply	☐ Rupture Disc (psig)
☐ Inert Gas Blanket of _____	☐ Carbon Adsorption[1]
☐ Vent to Vapor Combustion Device[1] (vapor combustors, flares, thermal oxidizers, enclosed combustors)	
☐ Conservation Vent (psig)	☐ Condenser[1]
Vacuum Setting Pressure Setting	
☐ Emergency Relief Valve (psig)	
Vacuum Setting Pressure Setting	
☐ Thief Hatch Weighted ☐ Yes ☐ No	

[1] Complete appropriate Air Pollution Control Device Sheet

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

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

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

TANK CONSTRUCTION AND OPERATION INFORMATION

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

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

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

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

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

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

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

25A. Year Internal Floaters Installed:

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

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

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

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

25F. Describe deck fittings:

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

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

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

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

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

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

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

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

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

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

36. Avg. daily temperature range of bulk liquid (°F):	36A. Minimum (°F):		36B. Maximum (°F):
37. Avg. operating pressure range of tank (psig):	37A. Minimum (psig):		37B. Maximum (psig):
38A. Minimum liquid surface temperature (°F):		38B. Corresponding vapor pressure (psia):	
39A. Avg. liquid surface temperature (°F):		39B. Corresponding vapor pressure (psia):	
40A. Maximum liquid surface temperature (°F):		40B. Corresponding vapor pressure (psia):	
41. Provide the following for each liquid or gas to be stored in the tank. Add additional pages if necessary.			
41A. Material name and composition:			
41B. CAS number:			
41C. Liquid density (lb/gal):			
41D. Liquid molecular weight (lb/lb-mole):			
41E. Vapor molecular weight (lb/lb-mole):			
41F. Maximum true vapor pressure (psia):			
41G. Maximum Reid vapor pressure (psia):			
41H. Months Storage per year. From: To:			
42. Final maximum gauge pressure and temperature prior to transfer into tank used as inputs into flashing emission calculations.			

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 , Modified or Relocated *(for existing tanks)* Was the tank manufactured after August 23, 2011? ☒ Yes ☐ No	6. Type of change: ☐ New construction ☐ New stored material ☐ Other (Low Pressure Tower) ☐ Relocation
7A. Description of Tank Modification *(if applicable)* N/A	
7B. Will more than one material be stored in this tank? *If so, a separate form must be completed for each material.* ☐ Yes ☒ No	
7C. Was USEPA Tanks simulation software utilized? ☐ Yes ☒ No ***If Yes, please provide the appropriate documentation and items 8-42 below are not required.***	

TANK INFORMATION

8. Design Capacity *(specify barrels or gallons).* Use the internal cross-sectional area multiplied by internal height. 100 bbls	
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 bbls	
13A. Maximum annual throughput (gal/yr) **See attached emissions calculations for all throughput values**	13B. Maximum daily throughput (gal/day) **See attached emissions calculations for all throughput values**
14. Number of tank turnovers per year **See attached emissions calculations for all throughput values**	15. Maximum tank fill rate (gal/min) **See attached emissions calculations for all throughput values**
16. Tank fill method ☐ Submerged ☒ Splash ☐ Bottom Loading	
17. Is the tank system a variable vapor space system? ☐ Yes ☒ No If yes, (A) What is the volume expansion capacity of the system (gal)? (B) What are the number of transfers into the system per year?	
18. Type of tank (check all that apply): ☒ Fixed Roof ☒ vertical ☐ horizontal ☒ flat roof ☐ cone roof ☐ dome roof ☐ other (describe) ☐ External Floating Roof ☐ pontoon roof ☐ double deck roof	

☐ Domed External (or Covered) Floating Roof
☐ Internal Floating Roof ☐ vertical column support ☐ self-supporting
☐ Variable Vapor Space ☐ lifter roof ☐ diaphragm
☐ Pressurized ☐ spherical ☐ cylindrical

PRESSURE/VACUUM CONTROL DATA

19. Check as many as apply:
☒ Does Not Apply ☐ Rupture Disc (psig)
☐ Inert Gas Blanket of _____ ☐ Carbon Adsorption[1]
☐ Vent to Vapor Combustion Device[1] (vapor combustors, flares, thermal oxidizers, enclosed combustors)
☐ Conservation Vent (psig) ☐ Condenser[1]
Vacuum Setting Pressure Setting
☐ Emergency Relief Valve (psig)
Vacuum Setting Pressure Setting
☐ Thief Hatch Weighted ☐ Yes ☐ No
[1] Complete appropriate Air Pollution Control Device Sheet

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

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

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

TANK CONSTRUCTION AND OPERATION INFORMATION

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

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

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

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

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

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

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

25A. Year Internal Floaters Installed:

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

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

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

25E. Is the floating roof equipped with a weather shield? ☐ Yes ☐ No			
25F. Describe deck fittings:			
26. Complete the following section for **Internal Floating Roof Tanks** ☒ Does not apply			
26A. Deck Type: ☐ Bolted ☐ Welded		26B. For bolted decks, provide deck construction:	
26C. Deck seam. Continuous sheet construction: ☐ 5 ft. wide ☐ 6 ft. wide ☐ 7 ft. wide ☐ 5 x 7.5 ft. wide ☐ 5 x 12 ft. wide ☐ other (describe)			
26D. Deck seam length (ft.):	26E. Area of deck (ft^2):	26F. For column supported tanks, # of columns:	26G. For column supported tanks, diameter of column:
27. Closed Vent System with VRU? ☐ Yes ☒ No			
28. Closed Vent System with Enclosed Combustor? ☐ Yes ☒ No			
SITE INFORMATION - Not Applicable: Tank calculations performed using E&P Tank software			
29. Provide the city and state on which the data in this section are based:			
30. Daily Avg. Ambient Temperature (°F):		31. Annual Avg. Maximum Temperature (°F):	
32. Annual Avg. Minimum Temperature (°F):		33. Avg. Wind Speed (mph):	
34. Annual Avg. Solar Insulation Factor (BTU/ft^2-day):		35. Atmospheric Pressure (psia):	
LIQUID INFORMATION - Not Applicable: Tank calculations performed using E&P Tank software			
36. Avg. daily temperature range of bulk liquid (°F):	36A. Minimum (°F):	36B. Maximum (°F):	
37. Avg. operating pressure range of tank (psig):	37A. Minimum (psig):	37B. Maximum (psig):	
38A. Minimum liquid surface temperature (°F):		38B. Corresponding vapor pressure (psia):	
39A. Avg. liquid surface temperature (°F):		39B. Corresponding vapor pressure (psia):	
40A. Maximum liquid surface temperature (°F):		40B. Corresponding vapor pressure (psia):	
41. Provide the following for each liquid or gas to be stored in the tank. Add additional pages if necessary.			
41A. Material name and composition:			
41B. CAS number:			
41C. Liquid density (lb/gal):			
41D. Liquid molecular weight (lb/lb-mole):			
41E. Vapor molecular weight (lb/lb-mole):			
41F. Maximum true vapor pressure (psia):			
41G. Maximum Reid vapor pressure (psia):			
41H. Months Storage per year. From: To:			
42. Final maximum gauge pressure and temperature prior to transfer into tank used as inputs into flashing emission calculations.			

STORAGE TANK DATA TABLE

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

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

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

ATTACHMENT M

Heaters Data Sheet

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

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

Emission Unit ID#[1]	Emission Point ID#[2]	Emission Unit Description (manufacturer, model #)	Year Installed/ Modified	Type[3] and Date of Change	Maximum Design Heat Input (MMBTU/hr)[4]	Fuel Heating Value (BTU/scf)[5]
S012	E012	Line Heater	2016	Existing; No change	1.54	~1,102
S013	E013	Line Heater	2016	Existing; No change	1.54	~1,102
S014	E014	Line Heater	2016	Existing; No change	1.54	~1,102
S015	E015	Line Heater	2016	Existing; No change	1.54	~1,102
S016	E016	Line Heater	2016	Existing; No change	1.54	~1,102
S017	E017	Line Heater	2016	Existing; No change	1.54	~1,102
S018	E018	Line Heater	2016	Existing; No change	1.54	~1,102
S019	E019	Line Heater	2016	Existing; No change	1.54	~1,102
S020	E020	Line Heater	2016	Existing; No change	1.54	~1,102
S021	E021	Thermoelectric Generator	2016	Existing; No change	0.013	~1,102
S022	E022	Thermoelectric Generator	2016	Existing; No change	0.013	~1,102
S023	E023	Thermoelectric Generator	2016	Existing; No change	0.013	~1,102

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

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

3 New, modification, removal

4 Enter design heat input capacity in MMBtu/hr.

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

ATTACHMENT N

Engines Data Sheet *(Not Applicable)*

ATTACHMENT N – INTERNAL COMBUSTION ENGINE DATA SHEET
NOT APPLICABLE

Complete this data sheet for each internal combustion engine at the facility. Include manufacturer performance data sheet(s) or any other supporting document if applicable. Use extra pages if necessary. *Generator(s) and microturbine generator(s) shall also use this form.*

Emission Unit ID#[1]			
Engine Manufacturer/Model			
Manufacturers Rated bhp/rpm			
Source Status[2]			
Date Installed/ Modified/Removed/Relocated[3]			
Engine Manufactured /Reconstruction Date[4]			
Check all applicable Federal Rules for the engine (include EPA Certificate of Conformity if applicable)[5]	☐40CFR60 Subpart JJJJ ☐JJJJ Certified? ☐40CFR60 Subpart IIII ☐IIII Certified? ☐40CFR63 Subpart ZZZZ ☐ NESHAP ZZZZ/ NSPS JJJJ Window ☐ NESHAP ZZZZ Remote Sources	☐40CFR60 Subpart JJJJ ☐JJJJ Certified? ☐40CFR60 Subpart IIII ☐IIII Certified? ☐40CFR63 Subpart ZZZZ ☐ NESHAP ZZZZ/ NSPS JJJJ Window ☐ NESHAP ZZZZ Remote Sources	☐40CFR60 Subpart JJJJ ☐JJJJ Certified? ☐40CFR60 Subpart IIII ☐IIII Certified? ☐40CFR63 Subpart ZZZZ ☐ NESHAP ZZZZ/ NSPS JJJJ Window ☐ NESHAP ZZZZ Remote Sources
Engine Type[6]			
APCD Type[7]			
Fuel Type[8]			
H_2S (gr/100 scf)			
Operating bhp/rpm			
BSFC (BTU/bhp-hr)			
Hourly Fuel Throughput	ft^3/hr gal/hr	ft^3/hr gal/hr	ft^3/hr gal/hr
Annual Fuel Throughput (Must use 8,760 hrs/yr unless emergency generator)	$MMft^3$/yr gal/yr	$MMft^3$/yr gal/yr	$MMft^3$/yr gal/yr
Fuel Usage or Hours of Operation Metered	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐

Calculation Methodology[9]	**Pollutant**[10]	**Hourly PTE (lb/hr)**[11]	**Annual PTE (tons/year)**[11]	**Hourly PTE (lb/hr)**[11]	**Annual PTE (tons/year)**[11]	**Hourly PTE (lb/hr)**[11]	**Annual PTE (tons/year)**[11]
Manufacturer	NO_x						
Manufacturer	CO						
Manufacturer	VOC						
AP-42	SO_2						
AP-42	PM_{10}						
AP-42	Formaldehyde						
AP-42	Total HAPs						
40 CFR Part 98 Subpart C	GHG (CO_2e)						

1 Enter the appropriate Source Identification Number for each natural gas-fueled reciprocating internal combustion compressor/generator engine located at the compressor station. Multiple compressor engines should be designated CE-1, CE-2, CE-3 etc. Generator engines should be designated GE-1, GE-2, GE-3 etc. Microturbine generator engines should be designated MT-1, MT-2, MT-3 etc. If more than three (3) engines exist, please use additional sheets.

2 Enter the Source Status using the following codes:

NS	Construction of New Source (installation)	ES	Existing Source
MS	Modification of Existing Source	RS	Relocated Source

REM Removal of Source

3 Enter the date (or anticipated date) of the engine's installation (construction of source), modification, relocation or removal.

4 Enter the date that the engine was manufactured, modified or reconstructed.

5 Is the engine a certified stationary spark ignition internal combustion engine according to 40CFR60 Subpart IIII/JJJJ? If so, the engine and control device must be operated and maintained in accordance with the manufacturer's emission-related written instructions. You must keep records of conducted maintenance to demonstrate compliance, but no performance testing is required. If the certified engine is not operated and maintained in accordance with the manufacturer's emission-related written instructions, the engine will be considered a non-certified engine and you must demonstrate compliance as appropriate.

Provide a manufacturer's data sheet for all engines being registered.

6 Enter the Engine Type designation(s) using the following codes:

2SLB	Two Stroke Lean Burn	4SRB	Four Stroke Rich Burn
4SLB	Four Stroke Lean Burn		

7 Enter the Air Pollution Control Device (APCD) type designation(s) using the following codes:

A/F	Air/Fuel Ratio	IR	Ignition Retard
HEIS	High Energy Ignition System	SIPC	Screw-in Precombustion Chambers
PSC	Prestratified Charge	LEC	Low Emission Combustion
NSCR	Rich Burn & Non-Selective Catalytic Reduction	OxCat	Oxidation Catalyst
SCR	Lean Burn & Selective Catalytic Reduction		

8 Enter the Fuel Type using the following codes:

PQ	Pipeline Quality Natural Gas	RG	Raw Natural Gas /Production Gas	D	Diesel

9 Enter the Potential Emissions Data Reference designation using the following codes. Attach all reference data used.

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

10 Enter each engine's Potential to Emit (PTE) for the listed regulated pollutants in pounds per hour and tons per year. PTE shall be calculated at manufacturer's rated brake horsepower and may reflect reduction efficiencies of listed Air Pollution Control Devices. Emergency generator engines may use 500 hours of operation when calculating PTE. PTE data from this data sheet shall be incorporated in the *Emissions Summary Sheet*.

11 PTE for engines shall be calculated from manufacturer's data unless unavailable.

Engine Air Pollution Control Device – NOT APPLICABLE
(Emission Unit ID# S030-S031, use extra pages as necessary)

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

☐ NSCR ☐ SCR ☐ Oxidation Catalyst

Provide details of process control used for proper mixing/control of reducing agent with gas stream:

Manufacturer:	Model #:
Design Operating Temperature:	Design gas volume: scfm
Service life of catalyst:	Provide manufacturer data? ☐Yes ☐ No
Volume of gas handled:	Operating temperature range for NSCR/Ox Cat: From °F to °F
Reducing agent used, if any:	Ammonia slip (ppm):

Pressure drop against catalyst bed (delta P):

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

Is temperature and pressure drop of catalyst required to be monitored per 40CFR63 Subpart ZZZZ?
☐ Yes ☐ No

How often is catalyst recommended or required to be replaced (hours of operation)?

How often is performance test required?
☐ Initial
☐ Annual
☐ Every 8,760 hours of operation
☐ Field Testing Required
☐ No performance test required. If so, why (please list any maintenance required and the applicable sections in NSPS/GACT, Per 40 CFR §60.4243(a)(1), EQT must maintain the certified engine and control device according to the manufacturer's emission related written instructions and keep records of conducted maintenance to demonstrate compliance, but no performance testing is required.

ATTACHMENT O

Truck Loading Data Sheet

ATTACHMENT O – TANKER TRUCK LOADING DATA SHEET

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

Truck Loadout Collection Efficiencies

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

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

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

Emission Unit ID#: S027	Emission Point ID#: E027	Year Installed/Modified: 2015
Emission Unit Description: Uncaptured losses from loading of produced fluids into tanker trucks		
Loading Area Data		
Number of Pumps: 1	Number of Liquids Loaded: 1	Max number of trucks loading at one (1) time: 1
Are tanker trucks pressure tested for leaks at this or any other location? ☐ Yes ☒ No ☐ Not Required If Yes, Please describe:		
Provide description of closed vent system and any bypasses. No vapor balancing required		
Are any of the following truck loadout systems utilized? ☐ Closed System to tanker truck passing a MACT level annual leak test? ☐ Closed System to tanker truck passing a NSPS level annual leak test? ☐ Closed System to tanker truck not passing an annual leak test and has vapor return?		

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

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

Bulk Liquid Data (use extra pages as necessary)

Liquid Name	Produced Fluids		
Max. Daily Throughput (1000 gal/day)	See attached emissions calculations for all throughput values		
Max. Annual Throughput (1000 gal/yr)	See attached emissions calculations for all throughput values		
Loading Method[1]	SP		
Max. Fill Rate (gal/min)	Varies		
Average Fill Time (min/loading)	Varies		
Max. Bulk Liquid Temperature (°F)	See E&P TANK results		
True Vapor Pressure[2]	See E&P TANK results		
Cargo Vessel Condition[3]	U		
Control Equipment or Method[4]	None		

Max. Collection Efficiency (%)		0		
Max. Control Efficiency (%)		0		
Max.VOC Emission Rate	Loading (lb/hr)	See attached emission calculations for breakdown		
	Annual (ton/yr)	See attached emission calculations for breakdown		
Max.HAP Emission Rate	Loading (lb/hr)	See attached emission calculations for breakdown		
	Annual (ton/yr)	See attached emission calculations for breakdown		
Estimation Method[5]		AP-42 Section 5.2 Methodology		

1 BF Bottom Fill SP Splash Fill SUB Submerged Fill

2 At maximum bulk liquid temperature

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

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

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

ATTACHMENT P

Glycol Dehydrator Data Sheet

ATTACHMENT P – GLYCOL DEHYDRATION UNIT DATA SHEET

Complete this data sheet for each Glycol Dehydration Unit, Reboiler, Flash Tank and/or Regenerator at the facility. Include gas sample analysis and GRI- GLYCalc™ input and aggregate report. Use extra pages if necessary.

Manufacturer: Valerus (or similar)	Model:
Max. Dry Gas Flow Rate: 65	Reboiler Design Heat Input: 0.75 MMBtu/hr
Design Type: ☒ TEG ☐ DEG ☐ EG	Source Status[1]: ES
Date Installed/Modified/Removed[2]: 2015	Regenerator Still Vent APCD/ERD[3]: FL (enclosed)
Control Device/ERD ID#[3]: C001	Fuel HV (BTU/scf): ~1,102
H_2S Content (gr/100 scf): neg.	Operation (hours/year): 8,760
Pump Rate (gpm): 7.5 (max)	
Water Content (wt %) in: Wet Gas: Saturated Dry Gas: 7.0 #/MMSCF	

Is the glycol dehydration unit exempt from 40CFR63 Section 764(d)? ☒ Yes ☐ No: If Yes, answer the following:

The actual annual average flowrate of natural gas to the glycol dehydration unit is less than 85 thousand standard cubic meters per day, as determined by the procedures specified in §63.772(b)(1) of this subpart. ☐ Yes ☒ No

The actual average emissions of benzene from the glycol dehydration unit process vent to the atmosphere are less than 0.90 megagram per year (1 ton per year), as determined by the procedures specified in §63.772(b)(2) of this subpart. ☒ Yes ☐ No

Is the glycol dehydration unit located within an Urbanized Area (UA) or Urban Cluster (UC)? ☐ Yes ☐ No N/A

Is a lean glycol pump optimization plan being utilized? ☐ Yes ☐ No N/A

Recycling the glycol dehydration unit back to the flame zone of the reboiler.
☐ Yes ☒ No

Recycling the glycol dehydration unit back to the flame zone of the reboiler and mixed with fuel.
☐ Yes ☒ No

What happens when temperature controller shuts off fuel to the reboiler?
☐ Still vent emissions to the atmosphere.
☐ Still vent emissions stopped with valve.
☐ Still vent emissions to glow plug.
☒ None of the above: Still vent emissions are controlled by an enclosed combustor

Please indicate if the following equipment is present.
☒ Flash Tank
☐ Burner management system that continuously burns condenser or flash tank vapors

Control Device Technical Data

Pollutants Controlled	Manufacturer's Guaranteed Control Efficiency (%)
VOC	98
HAP	98
Benzene	98

Emissions Data

Emission Unit ID / Emission Point ID[4]	Description	Calculation Methodology[5]	PTE[6]	Controlled Maximum Hourly Emissions (lb/hr)	Controlled Maximum Annual Emissions (tpy)
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	0.24	1.07
		GRI-GLYCalc™	Benzene	0.01	0.02
		GRI-GLYCalc™	Ethylbenzene	0.01	0.06
		GRI-GLYCalc™	Toluene	0.02	0.08
		GRI-GLYCalc™	Xylenes	0.02	0.08
		GRI-GLYCalc™	n-Hexane	2.2E-03	0.01

1 Enter the Source Status using the following codes:

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

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

3 Enter the Air Pollution Control Device (APCD)/Emission Reduction Device (ERD) type designation using the following codes and the device ID number:

NA	None	CD	Condenser	FL	Flare	
CC	Condenser/Combustion Combination	TO	Thermal Oxidizer	O	Other	(please list)

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

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

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

6 Enter the Reboiler Vent and Glycol Regenerator Still Vent Potential to Emit (PTE) for the listed regulated pollutants in lbs per hour and tons per year. The Glycol Regenerator Still Vent potential emissions may be determined using the most recent version of the thermodynamic software model GRI-GLYCalc™ (Radian International LLC & Gas Research Institute). **Attach all referenced Potential Emissions Data (or calculations) and the GRI-GLYCalc™ Aggregate Calculations Report (shall include emissions reports, equipment reports, and stream reports) to this Glycol Dehydration Emission Unit Data Sheet(s). Backup pumps do not have to be considered as operating for purposes of PTE.** This PTE data shall be incorporated in the Emissions Summary Sheet.

ATTACHMENT Q

Pneumatic Controller Data Sheet *(Not Applicable)*

ATTACHMENT Q – PNEUMATIC CONTROLLERS DATA SHEET

Are there any continuous bleed natural gas driven pneumatic controllers at this facility that commenced construction, modification or reconstruction after August 23, 2011?

☐ Yes ☒ No

Please list approximate number.

Are there any continuous bleed natural gas driven pneumatic controllers at this facility with a bleed rate greater than 6 standard cubic feet per hour that are required based on functional needs, including but not limited to response time, safety and positive actuation that commenced construction, modification or reconstruction after August 23, 2011?

☐ Yes ☒ No

Please list approximate number.

ATTACHMENT R

Air Pollution Control Device Data Sheet

ATTACHMENT R – AIR POLLUTION CONTROL DEVICE / EMISSION REDUCTION DEVICE SHEETS

Complete the applicable air pollution control device sheets for each flare, vapor combustor, thermal oxidizer, condenser, adsorption system, vapor recovery unit, BTEX Eliminator, Reboiler with and without Glow Plug, etc. at the facility. Use extra pages if necessary.

Emissions calculations must be performed using the most conservative control device efficiency.

The following five (5) rows are only to be completed if registering an alternative air pollution control device.	
Emission Unit ID: **Not Applicable**	Make/Model:
Primary Control Device ID:	Make/Model:
Control Efficiency (%):	APCD/ERD Data Sheet Completed: ☐ Yes ☐ No
Secondary Control Device ID:	Make/Model:
Control Efficiency (%):	APCD/ERD Data Sheet Completed: ☐ Yes ☐ No

VAPOR COMBUSTION
(Including Enclosed Combustors)

General Information

Control Device ID#: C001	Installation Date: ☒ New ☐ Modified ☐ Relocated	
Maximum Rated Total Flow Capacity ~2,243 scfh ~53,823 scfd	Maximum Design Heat Input (from mfg. spec sheet) 3.33 MMBTU/hr	Design Heat Content 1,500 BTU/scf

Control Device Information

Type of Vapor Combustion Control?

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

Manufacturer: LEED Fabrication Model: Enclosed Combustor 24”	Hours of operation per year? 8,760

List the emission units whose emissions are controlled by this vapor control device (Emission Point ID# S024)

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 (6) emission units, please attach additional pages.

Assist Type (Flares only)	Flare Height	Tip Diameter	Was the design per §60.18?
☐ Steam ☐ Air ☐ Pressure ☒ Non	24 feet	~2 feet	☐ Yes ☐ No ☒ N/A Provide determination.

Waste Gas Information

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

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

Pilot Gas Information

Number of Pilot Lights	Fuel Flow Rate to Pilot Flame per Pilot	Heat Input per Pilot	Will automatic re-ignition be used?
1	~24 scfh	0.03 MMBTU/hr	☐ Yes ☒ No

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

Is pilot flame equipped with a monitor to detect the presence of the flame? ☒ Yes ☐ No	If Yes, what type? ☒ Thermocouple ☐ Infrared ☐ Ultraviolet ☐ Camera ☐ Other:

Describe all operating ranges and maintenance procedures required by the manufacturer to maintain the warranty. *(If unavailable, please indicate).* See attached information on unit

Additional information attached? ☒ Yes ☐ No
Please attach copies of manufacturer’s data sheets, drawings, flame demonstration per §60.18 or §63.11(b) and performance testing.

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

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

VAPOR RECOVERY UNIT – Not Applicable

General Information

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

Device Information

Manufacturer:
Model:

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

Emission Unit ID#	Emission Source Description	Emission Unit ID#	Emission Source Description

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

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

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

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

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

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	Enviromental Control Equipment Data Sheet			By:	JS		
		P.O. No.:	-	Checked:	SG		
		RFQ No.:	-	Approved:	MS		
	Client:	Ref. P&ID:	-				
	Site:			Supplier:	LEED FABRICATION		
	Unit/Lease:	Remarks:	-	Model No.:	L30-0006-00		

GENERAL

1	Design Code:		NDE:	LEED Fabrication Standards
2	Service:		Customer Specs:	☐ Yes
3	Description:	Standard Single Stage 24 High Efficiency Combustor		☑ No

PROCESS DATA

	Gas Composition:	mol %	Process Conditions: Variable	Value	Units
4	Methane		Flow Rate	Up to 40	Mscfd
5	Ethane		Pressure	Up to 12	oz/in2
6	Propane		Temperature		°F
7	I-Butane		Molecular Weight		
8	n-Butane		Process/Waste Stream	☑ Gas	☐ Liquid
9	I-Pentane		Detailed Process Description / Process Notes:		
10	n-Pentane		1. Turndown 10:1. Based on an expected normal operating rate indicated above.		
11	n-Hexane		2. DRE: 98 % operating at design conditions		
12	CO2		3. Burner Pressure Drop: Min. 0.10 oz/in2		
13	N2				
14	Helium				
15	H_2O				
16	C7				
17	C8				
18	C9				
19	C10				
20	C11+				
21	TOTAL				

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

DESIGN DATA

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

EQUIPMENT SPECIFICATION

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

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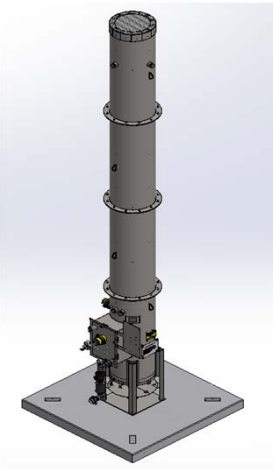
	Site:			Supplier:	LEED FABRICATION		
	Unit/Lease:	Remarks:	-	Model No.:	L30-0006-00		

EQUIPMENT SPECIFICATION

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



FABRICATION AND INSPECTION

76	**Special requirements**	☐ Skid Mounted ☑ Concrete Pad	**Equipment Info**	
77		☐ Other	**Component**	**Weight / Dimensions**
78			**Burner**	
79	**Inspection**	☑ Vendor Standard	Burner Assembly	
80		☐ Other. Specify:	**Stack**	
81	**Material Certification**	☑ Vendor Standard	Stack Assembly	24 " OD x 24 ' H
82		☐ MTR	Pilot Tip	
83		☐ Certificate of Compliance	Pilot Line(s)	
84		☐ Other (Specify):	Stack Assembly	
85	**NDE**	☑ Vendor Standard	**Auxiliary Equipment**	
86		☐ Radiography. Specify:	Blowers	
87		☐ Ultrasonic. Specify:	Inlet KO / Liquid Seal	
88		☐ Liquid Penetrant.	Flame / Detonation Arrestor	
89		☐ Magnetic Particles.	Skid	
90		☐ PMI. Specify:	**Instrumentation & Controls**	
91		☐ Other. Specify:	BMS	
92	**Surface Preparation**	☑ Vendor Standard	Control Panel	
93		☐ Other. Specify:		
94	**Paint System**	☑ Vendor Standard		
95		☐ Other. Specify:		
96	**Finished Color**	☑ Vendor Standard		
97		☐ Other. Specify:		
98				
99				

Additional Notes:

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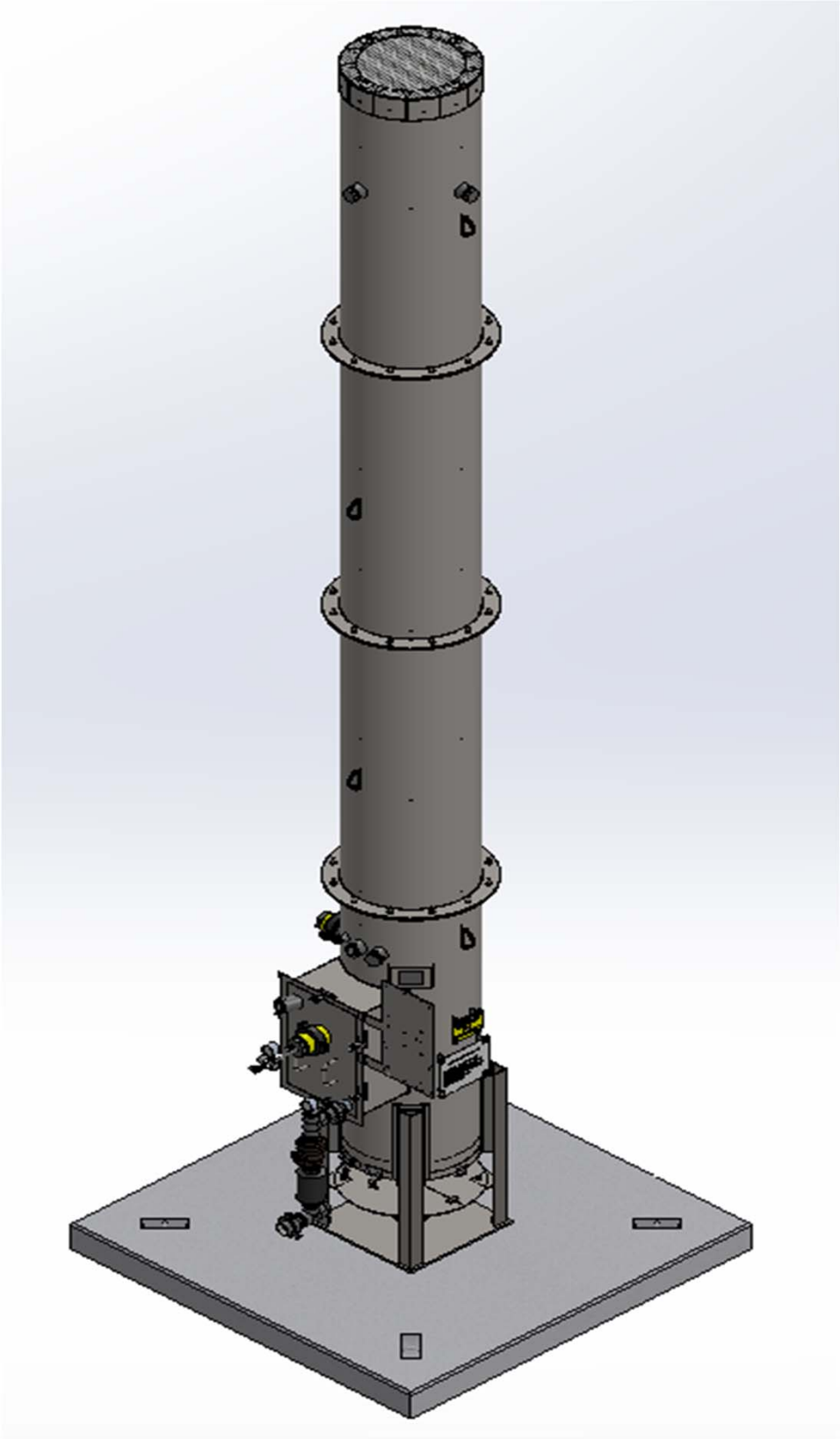
Site:				Supplier:	LEED FABRICATION		
Unit/Lease:		Remarks:	-	Model No.:	L30-0006-00		

GENERAL ARRANGEMENT



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

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

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

Enclosed (Passive Swirl) Flare Flow Rates

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

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

3/8" Orifice: Dia =	0.00635	m		
Area =	3.16692E-05	m^2	6894.757	Conversion from PSI to Pa (R)
Cd =	1		127132.8	m^3/s to ft^3/hr (M)
Density =	0.8	kg/m^3		

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

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

ATTACHMENT S

Emission Calculations

Company Name: EQT Production, LLC
Facility Name: GLO 76 Wellpad
Project Description: G70C 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 #	Emission Source ID#s	Emission Source Description	NO_X		CO		VOC		SO_2		PM_{10}		$PM_{2.5}$		CO_2e	
			lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
C001	S024	Dehydrator	---	---	---	---	0.24	1.07	---	---	---	---	---	---	46.68	204.46
C001	C001	Dehy Combustor	0.30	1.34	0.26	1.12	0.02	0.07	0.00	0.01	0.02	0.10	0.02	0.10	393.52	1,723.60
C001	**S024, C001**	**---**	**0.30**	**1.34**	**0.26**	**1.12**	**0.26**	**1.14**	**0.00**	**0.01**	**0.02**	**0.10**	**0.02**	**0.10**	**440.20**	**1,928.06**
E001	S001	Storage Tank	---	---	---	---	0.05	0.20	---	---	---	---	---	---	0.13	0.53
E002	S002	Storage Tank	---	---	---	---	0.05	0.20	---	---	---	---	---	---	0.13	0.53
E003	S003	Storage Tank	---	---	---	---	0.05	0.20	---	---	---	---	---	---	0.13	0.53
E004	S004	Storage Tank	---	---	---	---	0.05	0.20	---	---	---	---	---	---	0.13	0.53
E005	S005	Storage Tank	---	---	---	---	0.05	0.20	---	---	---	---	---	---	0.13	0.53
E006	S006	Storage Tank	---	---	---	---	0.05	0.20	---	---	---	---	---	---	0.13	0.53
E007	S007	Storage Tank	---	---	---	---	0.05	0.20	---	---	---	---	---	---	0.13	0.53
E008	S008	Storage Tank	---	---	---	---	0.05	0.20	---	---	---	---	---	---	0.13	0.53
E009	S009	Storage Tank	---	---	---	---	0.05	0.20	---	---	---	---	---	---	0.13	0.53
E010	S010	Storage Tank	---	---	---	---	0.05	0.20	---	---	---	---	---	---	0.13	0.53
E011	S011	Sand Separator Tank	---	---	---	---	0.01	0.02	---	---	---	---	---	---	1.1E-02	0.05
E012	S012	Line Heater	0.14	0.61	0.12	0.51	0.01	0.03	8.4E-04	3.7E-03	0.01	0.05	0.01	0.05	180.18	789.20
E013	S013	Line Heater	0.14	0.61	0.12	0.51	0.01	0.03	8.4E-04	3.7E-03	0.01	0.05	0.01	0.05	180.18	789.20
E014	S014	Line Heater	0.14	0.61	0.12	0.51	0.01	0.03	8.4E-04	3.7E-03	0.01	0.05	0.01	0.05	180.18	789.20
E015	S015	Line Heater	0.14	0.61	0.12	0.51	0.01	0.03	8.4E-04	3.7E-03	0.01	0.05	0.01	0.05	180.18	789.20
E016	S016	Line Heater	0.14	0.61	0.12	0.51	0.01	0.03	8.4E-04	3.7E-03	0.01	0.05	0.01	0.05	180.18	789.20
E017	S017	Line Heater	0.14	0.61	0.12	0.51	0.01	0.03	8.4E-04	3.7E-03	0.01	0.05	0.01	0.05	180.18	789.20
E018	S018	Line Heater	0.14	0.61	0.12	0.51	0.01	0.03	8.4E-04	3.7E-03	0.01	0.05	0.01	0.05	180.18	789.20
E019	S019	Line Heater	0.14	0.61	0.12	0.51	0.01	0.03	8.4E-04	3.7E-03	0.01	0.05	0.01	0.05	180.18	789.20
E020	S020	Line Heater	0.14	0.61	0.12	0.51	0.01	0.03	8.4E-04	3.7E-03	0.01	0.05	0.01	0.05	180.18	789.20
E021	S021	Thermoelectric Generator	1.2E-03	0.01	9.9E-04	4.3E-03	6.5E-05	2.8E-04	7.1E-06	3.1E-05	8.9E-05	3.9E-04	8.9E-05	3.9E-04	1.52	6.65
E022	S022	Thermoelectric Generator	1.2E-03	0.01	9.9E-04	4.3E-03	6.5E-05	2.8E-04	7.1E-06	3.1E-05	8.9E-05	3.9E-04	8.9E-05	3.9E-04	1.52	6.65
E023	S023	Thermoelectric Generator	1.2E-03	0.01	9.9E-04	4.3E-03	6.5E-05	2.8E-04	7.1E-06	3.1E-05	8.9E-05	3.9E-04	8.9E-05	3.9E-04	1.52	6.65
E025	S025	Reboiler	0.07	0.30	0.06	0.25	3.7E-03	0.02	4.1E-04	1.8E-03	0.01	0.02	0.01	0.02	87.84	384.73
E026	S026	Dehy Drip Tank	---	---	---	---	0.05	0.20	---	---	---	---	---	---	0.13	0.53
E027	S027	Liquid Loading	---	---	---	---	3.71	0.96	---	---	---	---	---	---	---	---
---	---	Fugitives	---	---	---	---	---	11.44	---	---	---	---	---	---	---	937.07
---	---	Haul Roads	---	---	---	---	---	---	---	---	---	0.53	---	0.05	---	---
Facility Total			1.63	7.15	1.37	6.01	4.55	16.09	0.01	0.04	0.12	1.07	0.12	0.60	2,155.61	10,378.39
Facility Total (excluding fugitive emissions)			1.63	7.15	1.37	6.01	0.85	3.68	0.01	0.04	0.12	0.54	0.12	0.54	2,155.61	9,441.33

1. Hourly emissions for liquid loading assume two hours of loading per day, five days per week. Emissions from the dehy drip tank are conservatively assumed equal to one produced fluid storage tank.

Company Name: EQT Production, LLC
Facility Name: GLO 76 Wellpad
Project Description: G70C 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 #	Emission Source ID#s	Emission Source Description	Formaldehyde		Benzene		Toluene		Ethylbenzene		Xylenes		n-Hexane		Total HAP	
			lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
C001	S024	Dehydrator	---	---	0.01	0.02	0.02	0.08	0.01	0.06	0.02	0.08	0.00	0.01	0.06	0.25
C001	C001	Dehy Combustor	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C001	**S024, C001**	---	**<0.01**	**<0.01**	**0.01**	**0.02**	**0.02**	**0.08**	**0.01**	**0.06**	**0.02**	**0.08**	**0.00**	**0.01**	**0.06**	**0.25**
E001	S001	Storage Tank	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.0E-03	<0.01	1.0E-03	<0.01	<0.01
E002	S002	Storage Tank	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.0E-03	<0.01	1.0E-03	<0.01	<0.01
E003	S003	Storage Tank	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.0E-03	<0.01	1.0E-03	<0.01	<0.01
E004	S004	Storage Tank	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.0E-03	<0.01	1.0E-03	<0.01	<0.01
E005	S005	Storage Tank	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.0E-03	<0.01	1.0E-03	<0.01	<0.01
E006	S006	Storage Tank	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.0E-03	<0.01	1.0E-03	<0.01	<0.01
E007	S007	Storage Tank	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.0E-03	<0.01	1.0E-03	<0.01	<0.01
E008	S008	Storage Tank	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.0E-03	<0.01	1.0E-03	<0.01	<0.01
E009	S009	Storage Tank	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.0E-03	<0.01	1.0E-03	<0.01	<0.01
E010	S010	Storage Tank	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.0E-03	<0.01	1.0E-03	<0.01	<0.01
E011	S011	Sand Separator Tank	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E012	S012	Line Heater	1.0E-04	4.6E-04	2.9E-06	1.3E-05	4.7E-06	2.1E-05	---	---	---	---	2.5E-03	0.01	2.6E-03	0.01
E013	S013	Line Heater	1.0E-04	4.6E-04	2.9E-06	1.3E-05	4.7E-06	2.1E-05	---	---	---	---	2.5E-03	0.01	2.6E-03	0.01
E014	S014	Line Heater	1.0E-04	4.6E-04	2.9E-06	1.3E-05	4.7E-06	2.1E-05	---	---	---	---	2.5E-03	0.01	2.6E-03	0.01
E015	S015	Line Heater	1.0E-04	4.6E-04	2.9E-06	1.3E-05	4.7E-06	2.1E-05	---	---	---	---	2.5E-03	0.01	2.6E-03	0.01
E016	S016	Line Heater	1.0E-04	4.6E-04	2.9E-06	1.3E-05	4.7E-06	2.1E-05	---	---	---	---	2.5E-03	0.01	2.6E-03	0.01
E017	S017	Line Heater	1.0E-04	4.6E-04	2.9E-06	1.3E-05	4.7E-06	2.1E-05	---	---	---	---	2.5E-03	0.01	2.6E-03	0.01
E018	S018	Line Heater	1.0E-04	4.6E-04	2.9E-06	1.3E-05	4.7E-06	2.1E-05	---	---	---	---	2.5E-03	0.01	2.6E-03	0.01
E019	S019	Line Heater	1.0E-04	4.6E-04	2.9E-06	1.3E-05	4.7E-06	2.1E-05	---	---	---	---	2.5E-03	0.01	2.6E-03	0.01
E020	S020	Line Heater	1.0E-04	4.6E-04	2.9E-06	1.3E-05	4.7E-06	2.1E-05	---	---	---	---	2.5E-03	0.01	2.6E-03	0.01
E021	S021	Thermoelectric Generator	8.8E-07	3.9E-06	2.5E-08	1.1E-07	4.0E-08	1.8E-07	---	---	---	---	2.1E-05	9.3E-05	2.2E-05	9.7E-05
E022	S022	Thermoelectric Generator	8.8E-07	3.9E-06	2.5E-08	1.1E-07	4.0E-08	1.8E-07	---	---	---	---	2.1E-05	9.3E-05	2.2E-05	9.7E-05
E023	S023	Thermoelectric Generator	8.8E-07	3.9E-06	2.5E-08	1.1E-07	4.0E-08	1.8E-07	---	---	---	---	2.1E-05	9.3E-05	2.2E-05	9.7E-05
E025	S025	Reboiler	5.1E-05	2.2E-04	1.4E-06	6.3E-06	2.3E-06	1.0E-05	---	---	---	---	1.2E-03	0.01	1.3E-03	0.01
E026	S026	Dehy Drip Tank	---	---	---	---	<0.01	<0.01	---	---	---	---	---	---	<0.01	<0.01
E027	S027	Liquid Loading	---	---	1.9E-03	4.8E-04	3.5E-03	9.1E-04	2.0E-04	5.1E-05	2.6E-03	6.9E-04	0.08	0.02	0.09	0.02
---	---	Fugitives	---	---	---	<0.01	---	0.01	---	<0.01	---	<0.01	---	0.07	---	0.11
---	---	Haul Roads	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Facility Total			1.0E-03	4.4E-03	0.01	0.02	0.02	0.09	0.01	0.06	0.02	0.09	0.10	0.21	0.17	0.49
Facility Total (excluding fugitive emissions)			1.0E-03	4.4E-03	0.01	0.02	0.02	0.08	0.01	0.06	0.02	0.09	0.03	0.12	0.08	0.36

1. Hourly emissions for liquid loading assume two hours of loading per day, five days per week. Emissions from the dehy drip tank are conservatively assumed equal to one produced fluid storage tank.

Company Name: **EQT Production, LLC**
Facility Name: **GLO 76 Wellpad**
Project Description: **G70C 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: G70C 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: **G70C 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: **G70C 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: **G70C 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: **G70C 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: **G70C 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: **G70C 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 $(tons/yr)_{Potential}$ = $(lb/hr)_{Emissions}$ × (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: **G70C 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	1.18	28.39	5.18
Methane	1.8199	43.6770	7.9710
Ethane	0.3850	9.2410	1.6865
Propane	0.1050	2.5210	0.4601
Isobutane	0.0207	0.4960	0.0905
n-Butane	0.0259	0.6220	0.1136
Isopentane	0.0088	0.2110	0.0385
n-Pentane	0.0050	0.1210	0.0221
Cyclopentane	0.0006	0.0160	0.0028
n-Hexane*	0.0022	0.0530	0.0097
Cyclohexane	0.0013	0.0310	0.0056
Other Hexanes	0.0061	0.1460	0.0267
Heptanes	0.0063	0.1520	0.0277
Methylcyclohexane	0.0016	0.0390	0.0072
2,2,4-Trimethylpentane*	0.0002	0.0050	0.0009
Benzene*	0.0051	0.1220	0.0222
Toluene*	0.0173	0.4160	0.0759
Ethylbenzene*	0.0132	0.3160	0.0577
Xylenes*	0.0181	0.4340	0.0792
C8 + Heavier Hydrocarbons	0.0068	0.1630	0.0297
Total Emissions	2.4492	58.7810	10.7276
Total Hydrocarbon Emissions	2.4492	58.7810	10.7276
Total VOC Emissions	0.2443	5.8640	1.0701
Total HAP Emissions	0.0561	1.3460	0.2457

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	0.30	1.32	<0.01	0.01
CO	7.6E-02	0.25	1.11	<0.01	0.01
PM/PM_{10}	6.9E-03	0.02	0.10	<0.01	<0.01
SO_2	5.4E-04	<0.01	0.01	<0.01	<0.01
VOC	5.0E-03	0.02	0.07	<0.01	<0.01
CO_2 (Natural Gas Firing)	116.997	389.60	1,706.45	3.51	15.37
CH_4 (Natural Gas Firing)	2.2E-03	0.01	0.03	<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	3.33 MMBtu/hr	Maximum rating for LEED 24" enclosed combustor.
Pilot Rating	0.03 MMBtu/hr	
Capture Efficiency:	100 %	
Destruction Efficiency:	98 %	
Total Control Efficiency:	98 %	

* HAPs

[1] Based on GRI GLYCalc 4.0 run at dry gas flowrate of 65 MMscf/day, tower temperature 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 98% total control efficiency.

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

Company Name: **EQT Production, LLC**
Facility Name: **GLO 76 Wellpad**
Project Description: **G70C 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: **G70C 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: **G70C 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
Intermittent Pneumatic Devices	Gas	2.88E-01	45	28.56	41.70
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:	**54.96**	**157.32**

[1] U.S. EPA. Office of Air Quality Planning and Standards. *Protocol for Equipment Leak Emission Estimates.* Table 2-1. (Research Triangle Park, NC: U.S. EPA EPA-453/R-95-017, 1995). SOCMI factors were used as it was representative of natural gas liquids extraction. The pneumatic device emission factors are converted from Subpart W factors using the molecular weight of the gas and assuming 379 scf/lb-mol. Assumes intermittent pneumatic operation 1/3 of the year.

[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: **G70C 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	2.61	11.44
Hexane	1.6E-02	7.0E-02
Benzene	<0.001	<0.001
Toluene	2.8E-03	0.01
Ethylbenzene	<0.001	<0.001
2,2,4-trimethylpentane	7.0E-03	3.1E-02
Xylene	<0.001	<0.001
Total HAP	2.6E-02	0.11

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	25.31
Open-Ended Lines	25	6.1E-02	2.5E-01	1.3E-03	6.34
Pressure Relief Devices	51	4.0E-02	3.4E-01	1.7E-03	8.49
Pneumatic Devices	45	13.5	3.4E+01	1.7E-01	842.45
Valves	485	2.7E-02	2.2E+00	1.1E-02	54.48
Total			**37.5**	**0.192**	**937**

[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. The pneumatic controller value is equal to Subpart W value for intermittent controlled (scf/hr). Intermittent devices assume operation 1/3 of the time.
[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: **G70C 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: **G70C 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: G70C 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	3.33	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	53.82	MSCFD	Max. flowrate from LEED Combustor Operations Manual
	2,243	scf/hr	
	37	scf/min	

Enclosed Combustor Mass Flow Rate (C001)

$$\frac{2{,}243\ \text{scf}}{\text{hr}} * \frac{1\ \text{lbmole}}{379\ \text{scf}} * \frac{18.89\ \text{lb}}{\text{lbmole}} = \frac{112\ \text{lb}}{\text{hr}}$$

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: **G70C 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: **G70C 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:

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

0	**bbl**	+	19,506	**bbl**	*	1%	**Condensate % in PW**	*	12	**months**	*	1 **year**	
	month			**month**						**year**		365 **days**	10 **# of Tanks at Wellpad**

Total Produced Fluid Throughput for E&P = **1** **bbl** / **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\2015-0727_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
    *
**************************************************************************************
******

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]

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******
* 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

```
**************************************************************************************
******
*     Project Setup Information
    *
**************************************************************************************
******
Project File              : Z:\Client\EQT Corporation\West Virginia\WV
Wells\163901.0058 WV Wells 2016\GLO 76\02 Draft\2016-0511 Class II AA (G70B App)\Att
S 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 Produced Fluid 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
```

20151029_GLO-76_Produced Water Tank

-- Sales Oil

Production Rate : 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	0.253	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 %
1	H2S	34.80	0.0000	0.0000	0.0000	0.0000	0.0000
2	O2	32.00	0.0000	0.0000	0.0000	0.0000	0.0000
3	CO2	44.01	0.0060	0.0060	0.0000	0.0000	0.3065
4	N2	28.01	0.0000	0.0000	0.0000	0.0000	0.0000
5	C1	16.04	0.4330	0.4330	0.0000	0.0000	22.1152
6	C2	30.07	0.3350	0.3350	0.0001	0.0000	17.1058
7	C3	44.10	0.4850	0.4850	0.0067	0.0000	24.4356
8	i-C4	58.12	0.2770	0.2770	0.0594	0.0000	11.1733
9	n-C4	58.12	0.6680	0.6680	0.2975	0.0000	19.2242
10	i-C5	72.15	0.6310	0.6310	0.5939	0.0000	2.4885
11	n-C5	72.15	0.5480	0.5480	0.5361	0.0000	1.1447
12	C6	86.16	1.1670	1.1670	1.1834	0.0000	0.3483
13	C7	100.20	7.7640	7.7640	7.9055	0.0000	0.6787
14	C8	114.23	17.5600	17.5600	17.9010	0.0000	0.4832
15	C9	128.28	14.4830	14.4830	14.7692	0.0000	0.1489
16	C10+	168.15	47.7340	47.7340	48.6867	0.0000	0.0258
17	Benzene	78.11	0.0370	0.0370	0.0376	0.0000	0.0071
18	Toluene	92.13	0.9610	0.9610	0.9792	0.0000	0.0484
19	E-Benzene	106.17	0.2690	0.2690	0.2743	0.0000	0.0045
20	Xylenes	106.17	5.8420	5.8420	5.9570	0.0000	0.0854
21	n-C6	86.18	0.7890	0.7890	0.8013	0.0000	0.1750
22	224Trimethylp	114.24	0.0110	0.0110	0.0112	0.0000	0.0008
	MW		135.89	135.89	137.77	0.00	41.90
	Stream Mole Ratio		1.0000	1.0000	0.9804	0.0000	0.0196
	Heating Value	[BTU/SCF]				0.00	2387.71
	Gas Gravity	[Gas/Air]				0.00	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

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 Wells\153901.0056 WV Wells 2015\GLO 76\02 Draft\2015-1030 EQT GLO-76 G70 Ap Revised\Attach I - Emission Calcs\GLYCalc\20160223 GLO 76 Dehy PTE_v2.0.ddf
Date: February 23, 2016

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	0.0225	0.541	0.0987
Ethane	0.0190	0.457	0.0833
Propane	0.0124	0.297	0.0542
Isobutane	0.0039	0.093	0.0169
n-Butane	0.0063	0.151	0.0276
Isopentane	0.0025	0.061	0.0110
n-Pentane	0.0018	0.042	0.0077
Cyclopentane	0.0004	0.010	0.0019
n-Hexane	0.0012	0.028	0.0051
Cyclohexane	0.0010	0.025	0.0046
Other Hexanes	0.0027	0.065	0.0118
Heptanes	0.0046	0.110	0.0200
Methylcyclohexane	0.0014	0.034	0.0062
2,2,4-Trimethylpentane	0.0001	0.003	0.0005
Benzene	0.0050	0.119	0.0217
Toluene	0.0171	0.411	0.0750
Ethylbenzene	0.0131	0.314	0.0573
Xylenes	0.0180	0.432	0.0789
C8+ Heavies	0.0064	0.154	0.0281
Total Emissions	0.1394	3.345	0.6105
Total Hydrocarbon Emissions	0.1394	3.345	0.6105
Total VOC Emissions	0.0978	2.348	0.4286
Total HAP Emissions	0.0544	1.307	0.2385
Total BTEX Emissions	0.0532	1.276	0.2329

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	1.7973	43.136	7.8723
Ethane	0.3660	8.785	1.6032
Propane	0.0927	2.224	0.4059
Isobutane	0.0168	0.403	0.0736
n-Butane	0.0196	0.471	0.0859
Isopentane	0.0063	0.150	0.0275
n-Pentane	0.0033	0.079	0.0144
Cyclopentane	0.0002	0.005	0.0009
n-Hexane	0.0011	0.025	0.0046
Cyclohexane	0.0002	0.006	0.0011
Other Hexanes	0.0034	0.082	0.0149
Heptanes	0.0018	0.042	0.0077
Methylcyclohexane	0.0002	0.005	0.0010
2,2,4-Trimethylpentane	0.0001	0.002	0.0004
Benzene	0.0001	0.003	0.0005
Toluene	0.0002	0.005	0.0010
Ethylbenzene	0.0001	0.002	0.0004
Xylenes	0.0001	0.002	0.0003
C8+ Heavies	0.0004	0.009	0.0016
Total Emissions	2.3098	55.436	10.1171
Total Hydrocarbon Emissions	2.3098	55.436	10.1171
Total VOC Emissions	0.1465	3.516	0.6416
Total HAP Emissions	0.0016	0.039	0.0072
Total BTEX Emissions	0.0005	0.012	0.0021

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	1.8199	43.677	7.9710
Ethane	0.3850	9.241	1.6865
Propane	0.1050	2.521	0.4601
Isobutane	0.0207	0.496	0.0905
n-Butane	0.0259	0.622	0.1136
Isopentane	0.0088	0.211	0.0385
n-Pentane	0.0050	0.121	0.0221
Cyclopentane	0.0006	0.016	0.0028
n-Hexane	0.0022	0.053	0.0097
Cyclohexane	0.0013	0.031	0.0056
Other Hexanes	0.0061	0.146	0.0267
Heptanes	0.0063	0.152	0.0277
Methylcyclohexane	0.0016	0.039	0.0072
2,2,4-Trimethylpentane	0.0002	0.005	0.0009
Benzene	0.0051	0.122	0.0222
Toluene	0.0173	0.416	0.0759
Ethylbenzene	0.0132	0.316	0.0577
Xylenes	0.0181	0.434	0.0792
C8+ Heavies	0.0068	0.163	0.0297
Total Emissions	2.4492	58.781	10.7276
Total Hydrocarbon Emissions	2.4492	58.781	10.7276
Total VOC Emissions	0.2443	5.864	1.0701
Total HAP Emissions	0.0561	1.346	0.2457
Total BTEX Emissions	0.0537	1.288	0.2350

COMBINED REGENERATOR VENT/FLASH GAS EMISSION CONTROL REPORT:

Component	Uncontrolled tons/yr	Controlled tons/yr	% Reduction

Methane	398.5492	7.9710	98.00
Ethane	84.3246	1.6865	98.00
Propane	23.0058	0.4601	98.00
Isobutane	4.5242	0.0905	98.00
n-Butane	5.6775	0.1136	98.00
Isopentane	1.9255	0.0385	98.00
n-Pentane	1.1029	0.0221	98.00
Cyclopentane	0.1417	0.0028	98.00
n-Hexane	0.4870	0.0097	98.00
Cyclohexane	0.2808	0.0056	98.00
Other Hexanes	1.3349	0.0267	98.00
Heptanes	1.3858	0.0277	98.00
Methylcyclohexane	0.3601	0.0072	98.00
2,2,4-Trimethylpentane	0.0451	0.0009	98.00
Benzene	1.1097	0.0222	98.00
Toluene	3.7967	0.0759	98.00
Ethylbenzene	2.8847	0.0577	98.00
Xylenes	3.9598	0.0792	98.00
C8+ Heavies	1.4846	0.0297	98.00
Total Emissions	536.3807	10.7276	98.00
Total Hydrocarbon Emissions	536.3807	10.7276	98.00
Total VOC Emissions	53.5069	1.0701	98.00
Total HAP Emissions	12.2830	0.2457	98.00
Total BTEX Emissions	11.7509	0.2350	98.00

EQUIPMENT REPORTS:

COMBUSTION DEVICE

Ambient Temperature: 60.00 deg. F
Excess Oxygen: 5.00 %
Combustion Efficiency: 98.00 %
Supplemental Fuel Requirement: 7.82e-002 MM BTU/hr

Component	Emitted	Destroyed
Methane	2.00%	98.00%
Ethane	2.00%	98.00%
Propane	2.00%	98.00%
Isobutane	2.00%	98.00%
n-Butane	2.00%	98.00%
Isopentane	2.00%	98.00%
n-Pentane	2.00%	98.00%
Cyclopentane	2.00%	98.00%
n-Hexane	2.00%	98.00%
Cyclohexane	2.00%	98.00%
Other Hexanes	2.00%	98.00%
Heptanes	2.00%	98.00%
Methylcyclohexane	2.00%	98.00%
2,2,4-Trimethylpentane	2.00%	98.00%
Benzene	2.00%	98.00%
Toluene	2.00%	98.00%
Ethylbenzene	2.00%	98.00%
Xylenes	2.00%	98.00%
C8+ Heavies	2.00%	98.00%

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:	98.00	%
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: 7.87e+003 scfh
Control Method: Combustion Device
Control Efficiency: 98.00

Component	Conc. (vol%)	Loading (lb/hr)
Water	6.46e+001	2.41e+002
Carbon Dioxide	3.47e+001	3.17e+002
Nitrogen	9.47e-002	5.50e-001
Methane	5.40e-001	1.80e+000
Ethane	5.87e-002	3.66e-001
Propane	1.01e-002	9.27e-002
Isobutane	1.39e-003	1.68e-002
n-Butane	1.63e-003	1.96e-002
Isopentane	4.19e-004	6.27e-003
n-Pentane	2.19e-004	3.28e-003
Cyclopentane	1.47e-005	2.14e-004
n-Hexane	5.90e-005	1.06e-003
Cyclohexane	1.38e-005	2.40e-004
Other Hexanes	1.90e-004	3.40e-003
Heptanes	8.44e-005	1.76e-003
Methylcyclohexane	1.12e-005	2.27e-004
2,2,4-Trimethylpentane	3.97e-006	9.42e-005
Benzene	6.91e-006	1.12e-004
Toluene	1.14e-005	2.17e-004
Ethylbenzene	3.84e-006	8.47e-005
Xylenes	3.41e-006	7.52e-005
C8+ Heavies	1.06e-005	3.73e-004
Total Components	100.00	5.61e+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: 1.24e+000 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Methane	4.31e+001	2.25e-002
Ethane	1.94e+001	1.90e-002
Propane	8.62e+000	1.24e-002
Isobutane	2.04e+000	3.87e-003
n-Butane	3.33e+000	6.31e-003
Isopentane	1.07e+000	2.52e-003
n-Pentane	7.45e-001	1.75e-003
Cyclopentane	1.90e-001	4.33e-004
n-Hexane	4.16e-001	1.17e-003
Cyclohexane	3.80e-001	1.04e-003
Other Hexanes	9.60e-001	2.69e-003
Heptanes	1.40e+000	4.57e-003
Methylcyclohexane	4.43e-001	1.42e-003
2,2,4-Trimethylpentane	3.01e-002	1.12e-004
Benzene	1.95e+000	4.96e-003
Toluene	5.71e+000	1.71e-002
Ethylbenzene	3.79e+000	1.31e-002
Xylenes	5.21e+000	1.80e-002
C8+ Heavies	1.15e+000	6.41e-003

Total Components	100.00	1.39e-001

GRI-GLYCalc VERSION 4.0 - SUMMARY OF INPUT VALUES

Case Name: GLO-76
File Name: C:\Users\dtedesco\Desktop\2016-0519 Class I AA (G70B App)\Att S Emission Calcs\GLYCalc\20160223 GLO 76 Dehy PTE_v2.0.ddf
Date: May 19, 2016

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

WET GAS:

Temperature: 90.00 deg. F
Pressure: 800.00 psig
Wet Gas Water Content: Saturated

Component	Conc. (vol %)
Carbon Dioxide	0.1680
Nitrogen	0.3110
Methane	89.7400
Ethane	8.0850
Propane	1.2520
Isobutane	0.1600
n-Butane	0.1730
Isopentane	0.0470
n-Pentane	0.0230
Cyclopentane	0.0010
n-Hexane	0.0060
Cyclohexane	0.0010
Other Hexanes	0.0200
Heptanes	0.0090
Methylcyclohexane	0.0010
2,2,4-Trimethylpentane	0.0005
Benzene	0.0005
Toluene	0.0010
Ethylbenzene	0.0005
Xylenes	0.0005
C8+ Heavies	0.0020

DRY GAS:

Flow Rate: 65.0 MMSCF/day
Water Content: 7.0 lbs. H2O/MMSCF

LEAN GLYCOL:

Glycol Type: TEG
Water Content: 1.5 wt% H2O
Flow Rate: 7.5 gpm

PUMP:

Glycol Pump Type: Gas Injection
Gas Injection Pump Volume Ratio: 0.080 acfm gas/gpm glycol

FLASH TANK:

Flash Control: Combustion device
Flash Control Efficiency: 98.00 %
Temperature: 75.0 deg. F
Pressure: 70.0 psig

REGENERATOR OVERHEADS CONTROL DEVICE:

Control Device: Combustion Device
Destruction Efficiency: 98.0 %
Excess Oxygen: 5.0 %
Ambient Air Temperature: 60.0 deg. F

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

Extended Gas Analysis

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

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: 2030-14090265-001A

Carencro Laboratory
4790 NE Evangeline Thruway
Carencro, LA 70520

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

Pressurized Condensate Analysis

Sep. 30, 2014

Field:	EQT	Sampled By:	GR-GAS
Station Name:	513876	Sample Of:	Condensate Spot
Station Number:		Sample Date:	09/12/2014 10:30
Sample Point:	Wellhead	Sample Conditions:	80 psig
Analyzed:	09/30/2014 11:32:18 by CC	Method:	GPA-2186M/GPA-2103
		Cylinder No:	GAS

Analytical Data

Components	Mol. %	MW	Wt. %	Sp. Gravity	L.V. %
Nitrogen	NIL	28.013	NIL	0.807	NIL
Methane	0.433	16.043	0.051	0.300	0.131
Carbon Dioxide	0.006	44.010	0.002	0.817	0.002
Ethane	0.335	30.069	0.074	0.356	0.159
Propane	0.485	44.096	0.157	0.507	0.237
Iso-Butane	0.277	58.122	0.118	0.563	0.160
n-Butane	0.668	58.122	0.285	0.584	0.373
Iso-Pentane	0.631	72.149	0.334	0.625	0.409
n-Pentane	0.548	72.149	0.290	0.631	0.352
i-Hexanes	1.167	85.215	0.730	0.667	0.837
n-Hexane	0.789	86.175	0.499	0.664	0.575
2,2,4-Trimethylpentane	0.011	114.231	0.009	0.697	0.010
Benzene	0.037	78.114	0.021	0.885	0.018
Heptanes	7.764	98.897	5.637	0.699	6.170
Toluene	0.961	92.141	0.650	0.872	0.570
Octanes	17.560	110.849	14.291	0.729	14.992
Ethylbenzene	0.269	106.167	0.210	0.872	0.184
Xylenes	5.842	106.167	4.553	0.869	4.006
Nonanes	14.483	123.813	13.165	0.747	13.475
Decanes Plus	47.734	168.149	58.924	0.786	57.340
	100.000		100.000		100.000

Physical Properties	Total	C10+
Specific Gravity at 60°F	0.7649	0.7861
API Gravity at 60°F	53.487	48.503
Molecular Weight	136.216	168.149
Pounds per Gallon (in Vacuum)	6.377	6.554
Pounds per Gallon (in Air)	6.370	6.547
Cu. Ft. Vapor per Gallon @ 14.73 psia	17.725	14.757

Patti L. Petro

Hydrocarbon Laboratory Manager

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

Atmospheric Condensate Analysis

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

Certificate of Analysis : 2012120125-001A

Company:	Gas Analytical Services	**For:**	Gas Analytical Services
Well:	512441		Chuck Honaker
Field:	EQT Production		PO Box 1028
Sample of:	Condensate		
Conditions:	N.G. @ N.G.		Bridgeport, WV, 26330
Sampled by:	GR-GAS		
Sample date:	12/05/2012 @ 16:00	**Report Date:**	12/17/2012
Remarks:	Cylinder No.: GAS		
Remarks:			

Analysis: (*GPA 2186M*)	**Mol. %**	**MW**	**Wt. %**	**Sp. Gravity**	**L.V. %**
Nitrogen	0.000	28.013	0.000	0.8094	0.000
Methane	0.095	16.043	0.013	0.3000	0.032
Carbon Dioxide	0.000	44.010	0.000	0.8180	0.000
Ethane	0.602	30.070	0.154	0.3562	0.321
Propane	1.646	44.097	0.618	0.5070	0.905
Iso-butane	0.867	58.123	0.429	0.5629	0.566
N-butane	2.986	58.123	1.478	0.5840	1.879
Iso-pentane	3.103	72.150	1.907	0.6244	2.267
N-pentane	3.943	72.150	2.424	0.6311	2.851
i-Hexanes	4.939	86.177	3.584	0.6795	4.019
n-Hexane	4.692	85.671	3.445	0.6640	3.823
2,2,4 trimethylpentane	0.031	114.231	0.030	0.6967	0.032
Benzene	0.200	78.114	0.143	0.8846	0.113
Heptanes	14.686	97.881	12.265	0.7024	13.001
Toluene	1.138	92.141	0.967	0.8719	0.766
Octanes	14.442	107.726	13.331	0.7406	13.565
E-benzene	0.155	106.167	0.080	0.8718	0.120
M-,O-,P-xylene	1.763	106.167	1.595	0.8731	1.370
Nonanes	12.747	123.607	13.767	0.7557	13.680
Decanes Plus	31.965	160.734	43.770	0.7985	40.690
	100.000		100.000		100.000

Calculated Values	**Total Sample**	**Decanes Plus**
Specific Gravity at 60 °F	0.7423	0.7985
Api Gravity at 60 °F	59.115	45.704
Molecular Weight	117.386	160.734
Pounds per Gallon (in Vacuum)	6.189	6.658
Pounds per Gallon (in Air)	6.182	6.650
Cu. Ft. Vapor per Gallon @ 14.73 psia	20.054	15.682

Brian Leopard

Southern Petroleum Laboratories, Inc.

ATTACHMENT T

Emission Summary Sheet

ATTACHMENT T – FACILITY-WIDE CONTROLLED EMISSIONS SUMMARY SHEET

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

Emission Point ID# (Emission Source ID)	NO_x		CO		VOC		SO_2		PM_{10}		$PM_{2.5}$		GHG (CO_2e)	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
C001 (S024, C001)	0.30	1.34	0.26	1.12	0.26	1.14	0.00	0.01	0.02	0.10	0.020	0.10	440.20	1,928.06
E001	---	---	---	---	0.05	0.20	---	---	---	---	---	---	0.13	0.53
E002	---	---	---	---	0.05	0.20	---	---	---	---	---	---	0.13	0.53
E003	---	---	---	---	0.05	0.20	---	---	---	---	---	---	0.13	0.53
E004	---	---	---	---	0.05	0.20	---	---	---	---	---	---	0.13	0.53
E005	---	---	---	---	0.05	0.20	---	---	---	---	---	---	0.13	0.53
E006	---	---	---	---	0.05	0.20	---	---	---	---	---	---	0.13	0.53
E007	---	---	---	---	0.05	0.20	---	---	---	---	---	---	0.13	0.53
E008	---	---	---	---	0.05	0.20	---	---	---	---	---	---	0.13	0.53
E009	---	---	---	---	0.05	0.20	---	---	---	---	---	---	0.13	0.53
E010	---	---	---	---	0.05	0.20	---	---	---	---	---	---	0.13	0.53
E011	---	---	---	---	0.01	0.02	---	---	---	---	---	---	1.1E-02	0.05
E012	0.14	0.61	0.12	0.51	0.01	0.03	8.4 E-04	3.7 E-03	0.01	0.05	0.01	0.05	180.18	789.20
E013	0.14	0.61	0.12	0.51	0.01	0.03	8.4 E-04	3.7 E-03	0.01	0.05	0.01	0.05	180.18	789.20
E014	0.14	0.61	0.12	0.51	0.01	0.03	8.4 E-04	3.7 E-03	0.01	0.05	0.01	0.05	180.18	789.20
E015	0.14	0.61	0.12	0.51	0.01	0.03	8.4 E-04	3.7 E-03	0.01	0.05	0.01	0.05	180.18	789.20
E016	0.14	0.61	0.12	0.51	0.01	0.03	8.4 E-04	3.7 E-03	0.01	0.05	0.01	0.05	180.18	789.20

E017	0.14	0.61	0.12	0.51	0.01	0.03	8.4 E-04	3.7 E-03	0.01	0.05	0.01	0.05	180.18	789.20
E018	0.14	0.61	0.12	0.51	0.01	0.03	8.4 E-04	3.7 E-03	0.01	0.05	0.01	0.05	180.18	789.20
E019	0.14	0.61	0.12	0.51	0.01	0.03	8.4 E-04	3.7 E-03	0.01	0.05	0.01	0.05	180.18	789.20
E020	0.14	0.61	0.12	0.51	0.01	0.03	8.4 E-04	3.7 E-03	0.01	0.05	0.01	0.05	180.18	789.20
E021	1.2 E-03	0.01	9.9 E-04	4.3 E-03	6.5 E-05	2.8 E-04	7.1 E-06	3.1 E-05	8.9 E-05	3.9 E-04	8.9 E-05	3.9 E-04	1.52	6.65
E022	1.2 E-03	0.01	9.9 E-04	4.3 E-03	6.5 E-05	2.8 E-04	7.1 E-06	3.1 E-05	8.9 E-05	3.9 E-04	8.9 E-05	3.9 E-04	1.52	6.65
E023	1.2 E-03	0.01	9.9 E-04	4.3 E-03	6.5 E-05	2.8 E-04	7.1 E-06	3.1 E-05	8.9 E-05	3.9 E-04	8.9 E-05	3.9 E-04	1.52	6.65
E025	0.07	0.30	0.06	0.25	3.7 E-03	0.02	4.1 E-04	1.8 E-03	0.01	0.02	0.01	0.02	87.84	384.73
E026	---	---	---	---	0.05	0.20	---	---	---	---	---	---	0.13	0.53
E027	---	---	---	---	3.71	0.96	---	---	---	---	---	---	---	---
Fugitives	---	---	---	---	---	11.44	---	---	---	---	---	---	---	937.07
Haul Roads	---	---	---	---	---	---	---	---	---	0.53	---	0.05	---	---
Facility Total	1.63	7.15	1.37	6.01	4.55	16.09	0.01	0.04	0.12	1.07	0.12	0.60	2,155.61	10,378.39
Facility Total (excl. fugitives)	1.63	7.15	1.37	6.01	0.85	3.68	0.01	0.04	0.12	0.54	0.12	0.54	2,155.61	9,441.33

Annual emissions shall be based on 8,760 hours per year of operation for all emission units except emergency generators.
According to 45CSR14 Section 2.43.e, fugitive emissions are not included in the major source determination because it is not listed as one of the source categories in Table 1. Therefore, fugitive emissions shall not be included in the PTE above.

ATTACHMENT T – FACILITY-WIDE HAP CONTROLLED EMISSIONS SUMMARY SHEET

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

Emission Point ID#	Formaldehyde		Benzene		Toluene		Ethylbenzene		Xylenes		Hexane		Total HAPs	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
C001 (S024, C001)	**0.00**	**0.00**	**0.01**	**0.02**	**0.02**	**0.08**	**0.01**	**0.06**	**0.02**	**0.08**	**0.00**	**0.01**	**0.06**	**0.25**
E001	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.0 E-03	<0.01	1.0 E-03	<0.01	<0.01
E002	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.0 E-03	<0.01	1.0 E-03	<0.01	<0.01
E003	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.0 E-03	<0.01	1.0 E-03	<0.01	<0.01
E004	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.0 E-03	<0.01	1.0 E-03	<0.01	<0.01
E005	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.0 E-03	<0.01	1.0 E-03	<0.01	<0.01
E006	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.0 E-03	<0.01	1.0 E-03	<0.01	<0.01
E007	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.0 E-03	<0.01	1.0 E-03	<0.01	<0.01
E008	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.0 E-03	<0.01	1.0 E-03	<0.01	<0.01
E009	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.0 E-03	<0.01	1.0 E-03	<0.01	<0.01
E010	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.0 E-03	<0.01	1.0 E-03	<0.01	<0.01
E011	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E012	1.0 E-04	4.6 E-04	2.9 E-06	1.3 E-05	4.7 E-06	2.1 E-05	---	---	---	---	2.5 E-03	0.01	2.6 E-03	0.01
E013	1.0 E-04	4.6 E-04	2.9 E-06	1.3 E-05	4.7 E-06	2.1 E-05	---	---	---	---	2.5 E-03	0.01	2.6 E-03	0.01
E014	1.0 E-04	4.6 E-04	2.9 E-06	1.3 E-05	4.7 E-06	2.1 E-05	---	---	---	---	2.5 E-03	0.01	2.6 E-03	0.01
E015	1.0 E-04	4.6 E-04	2.9 E-06	1.3 E-05	4.7 E-06	2.1 E-05	---	---	---	---	2.5 E-03	0.01	2.6 E-03	0.01
E016	1.0 E-04	4.6 E-04	2.9 E-06	1.3 E-05	4.7 E-06	2.1 E-05	---	---	---	---	2.5 E-03	0.01	2.6 E-03	0.01

E017	1.0 E-04	4.6 E-04	2.9 E-06	1.3 E-05	4.7 E-06	2.1 E-05	---	---	---	---	2.5 E-03	0.01	2.6 E-03	0.01
E018	1.0 E-04	4.6 E-04	2.9 E-06	1.3 E-05	4.7 E-06	2.1 E-05	---	---	---	---	2.5 E-03	0.01	2.6 E-03	0.01
E019	1.0 E-04	4.6 E-04	2.9 E-06	1.3 E-05	4.7 E-06	2.1 E-05	---	---	---	---	2.5 E-03	0.01	2.6 E-03	0.01
E020	1.0 E-04	4.6 E-04	2.9 E-06	1.3 E-05	4.7 E-06	2.1 E-05	---	---	---	---	2.5 E-03	0.01	2.6 E-03	0.01
E021	8.8 E-07	3.9 E-06	2.5 E-08	1.1 E-07	4.0 E-08	1.8 E-07	---	---	---	---	2.1 E-05	9.3 E-05	2.2 E-05	9.7 E-05
E022	8.8 E-07	3.9 E-06	2.5 E-08	1.1 E-07	4.0 E-08	1.8 E-07	---	---	---	---	2.1 E-05	9.3 E-05	2.2 E-05	9.7 E-05
E023	8.8 E-07	3.9 E-06	2.5 E-08	1.1 E-07	4.0 E-08	1.8 E-07	---	---	---	---	2.1 E-05	9.3 E-05	2.2 E-05	9.7 E-05
E025	5.1 E-05	2.2 E-04	1.4 E-06	6.3 E-06	2.3 E-06	1.0 E-05	---	---	---	---	1.2 E-03	0.01	1.3 E-03	0.01
E026	---	---	---	---	<0.01	<0.01	---	---	---	---	---	---	<0.01	<0.01
E027	---	---	1.9 E-03	4.8 E-04	3.5 E-03	9.1 E-04	2.0 E-04	5.1 E-05	2.6 E-03	6.9 E-04	0.08	0.02	0.09	0.02
Fugitives	---	---	---	<0.01	---	0.01	---	<0.01	---	<0.01	---	0.07	---	0.11
Haul Roads	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Facility Total	1.0 E-03	4.4 E-03	0.01	0.02	0.02	0.09	0.01	0.06	0.02	0.09	0.10	0.21	0.17	0.49
Facility Total (excl. fugitives)	1.0 E-03	4.4 E-03	0.01	0.02	0.02	0.08	0.01	0.06	0.02	0.09	0.03	0.12	0.08	0.36

Annual emissions shall be based on 8,760 hours per year of operation for all emission units except emergency generators.
According to 45CSR14 Section 2.43.e, fugitive emissions are not included in the major source determination because it is not listed as one of the source categories in Table 1. Therefore, fugitive emissions shall not be included in the PTE above.

ATTACHMENT U

Class I Legal Advertisement

RECOMMENDED PUBLIC NOTICE TEMPLATE

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that EQT Production Company has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Class II Administrative Update to convert the current G-70A General Permit Registration into a G70-C for the natural gas production facility GLO-76 located approximately 1.0 miles north of Brink in Marion County, West Virginia. The latitude and longitude coordinates are: 39.18999 N, -80.81767 W.

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

Pollutant	Emissions in tpy (tons per year)
NOx	7.15
CO	6.01
VOC	16.09
SO_2	0.04
PM	1.07
Total HAPs	0.49
Carbon Dioxide Equivalents (CO_2e)	9,441.33

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

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1250, during normal business hours.
Dated this the **(Day)** day of **(Month)**, 2016.

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

ATTACHMENT V

General Permit Registration Application Fee