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

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

Alex Bosiljevac
Environmental Coordinator

June 28, 2016

CERTIFIED MAIL # 7015 1660 0000 9399 6451

Mr. Joe Kessler, Engineer
WVDEP – Division of Air Quality
601 57th Street, SE
Charleston, WV 25304

Re: R13 Permit Modification
EQT Gathering LLC – Janus Compressor Station
Doddridge County, WV

Dear Mr. Kessler:

Enclosed are two electronic copies and one original hard copy of a proposed modification to the Janus Station. A legal advertisement will be published in the next few days and proof of publication will be forwarded as soon as it is received. The changes to this application are outlined in the introduction.

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

Sincerely,

R. Alex Bosiljevac
EQT Corporation

Enclosures

CLASS II ADMINISTRATIVE UPDATE APPLICATION

EQT Gathering, LLC > Janus Compressor Station

Doddridge County, West Virginia

Prepared By:

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

June 2016

Trinity Consultants

Environmental solutions delivered uncommonly well

TABLE OF CONTENTS

EQT Gathering, LLC (EQT) is submitting this Class II Administrative update application to the West Virginia Department of Environmental Protection (WVDEP) for the natural gas compressor station located in Doddridge County, West Virginia (Janus Compressor Station). Specifically, this application seeks to designate the existing tank enclosed flare (FLARE-003) as an optional control during upset and emergency conditions and updated vented emissions from the facility. The Janus Station is currently permitted under R13 permit number R13-3269

1.1. FACILITY AND PROJECT DESCRIPTION

The Janus Compressor Station is a natural gas gathering facility covered under Standard Industrial Classification (SIC) code 1311. The facility will have the potential to operate 24 hours per day, and 7 days per week.

The station is currently permitted for the following equipment

- Four (4) lean burn natural gas fired compressor engines (each rated at 5,350 horsepower [hp]) equipped with oxidation catalyst,
- Two (2) triethylene glycol (TEG) dehydration units (each rated at 125 million standard cubic feet per day [MMscfd])), with associated reboilers (rated at 2.31 MMBtu/hr heat input) and controlled by enclosed flares (each rated at 7.0 MMbtu/hr),
- Five (5) microturbine generator (each rated 200 kW),
- Two (2) fuel gas heaters (rated at 1.15 MMbtu/hr and 0.77 MMbtu/hr),
- Two (2) produced fluid tanks (210 bbl each) controlled by a tank enclosed flare (rated at 41 MMbtu/hr), and
- Twenty two (22) miscellaneous storage tanks

EQT is submitting this application to in order to address the following:

- Update the facility wide fugitive emission calculations, station volume venting, and pigging emissions calculations. This includes updating the information included in Condition 4.1.12.c;
- Revise the description for the enclosed flare (FLARE-003) to "pressure-assisted;" and
- Designate the enclosed flare (FLARE-003) associated with the two (2) produced fluids (T-001 to T-002) as an optional control in the current permit. Specifically, EQT will use the enclosed flare for safety purposes when the produced liquids tanks receive condensate. As a result, EQT is requesting that the Department remove the following conditions from the current permit:
  - Condition 4.1.8.c
  - Conditions 4.1.11 and 4.2.7.

A description of each source category is included below. A process flow diagram is included as Attachment F

1.2. R-13 APPLICATION ORGANIZATION

This R-13 permit application is organized as follows:

- Section 2: Sample Emission Source Calculations;
- Section 3: R-13 Application Forms;
- Attachment A: Business Certificate;
- Attachment B: Map;
- Attachment C: Installation and Start Up Schedule;
- Attachment D: Regulatory Discussion;
- Attachment E: Plot Plan;
- Attachment F: Detailed Process Flow Diagram;
- Attachment G: Process Description;
- Attachment I: Emission Units Table;
- Attachment J: Emission Points Data Summary Sheet;
- Attachment K: Fugitive Emissions Data Summary Sheet;
- Attachment L: Emissions Unit Data Sheets;
- Attachment M: Air Pollution Control Device Sheet;
- Attachment N: Supporting Emission Calculations;
- Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans;
- Attachment P: Public Notice; and
- Application Fee

2. SAMPLE EMISSION SOURCE CALCULATIONS

The characteristics of air emissions from the Janus Compressor Station, along with the methodology used for calculating emissions from the proposed new sources, are described in narrative form below. Detailed supporting calculations are also provided in Attachment N.

Emissions from the proposed project at Janus Compressor Station will result from the flashing, working, and breathing losses from the storage tanks and fugitive emissions from component leaks will result from the operation of the station. The methodologies employed in calculating emissions from these sources have been summarized below, with specific citations included in Attachment N.

- **Storage Tanks:** Working, standing, and flash loss emissions of VOC and HAPs from the produced fluids storage tanks are calculated using E&P Tank v2.0. Liquid loading emissions are calculated using EPA AP-42 emission factors.

- **Fugitive Emissions:** Emissions from fugitive equipment leaks are calculated using published EPA emission factors and 40 CFR Part 98, Subpart W emission factors. Emissions from blowdown events are calculated using engineering estimates of the amount of gas vented during each event. Site specific gas analyses were used to speciate VOC, HAP, and GHG emissions.

- **Compressor Engines:** Potential emissions of nitrogen oxides (NO_X), CO, VOC, formaldehyde are calculated using factors provided by the engine and catalyst manufacturer. Potential emissions of sulfur dioxide (SO2), particulate matter (PM/PM10/PM2.5), and all other hazardous air pollutants (HAPs) are calculated using U.S. EPA's AP-42 factors for four stroke lean burn engines. Uncontrolled acrolein emission factor is based on San Diego Air Pollution Control District emissions testing factors[1] and assuming 1020 Btu/scf. The controlled emission factors in the reference were taken from units equipped with oxidation catalysts. For conservatism, EQT has calculated emissions assuming uncontrolled emissions (i.e., assuming a 99% control efficiency and back-calculating an uncontrolled emission rate). A sample calculation is included below:

$$\text{Uncontrolled Emission Factor } \left(\frac{\text{lb}}{\text{MMBtu}}\right) = \frac{\text{Controlled Emission Factor } \left(\frac{\text{lb}}{\text{MMscf}}\right)}{\text{Btu Content } \left(\frac{\text{MMBtu}}{\text{MMscf}}\right) \text{x } (1 - \text{Assumed Control Efficiency})}$$

$$= \frac{0.01 \left(\frac{\text{lb}}{\text{MMscf}}\right)}{1020 \left(\frac{\text{MMBtu}}{\text{MMscf}}\right) \text{x } (1 - 99\%)}$$

$$= 9.80\text{E} - 04 \frac{\text{lb}}{\text{MMBtu}}$$

Potential emissions of greenhouse gas pollutants (GHGs) are calculated using manufacturer's data as available (CO_2 and CH_4 in this case) and U.S. EPA's emission factors from 40 CFR Part 98, Subpart C for all others.

[1] http://www.sdapcd.org/content/dam/sdc/apcd/PDF/Misc/EFT/Gas_Combustion/APCD_Engine_Natural_Gas_Fired_4_Stroke_Lean_Burn_with_Catalytic_Oxidation.pdf

3. R13 APPLICATION FORM

The WVDEP permit application forms contained in this application include all applicable R13 application forms including the required attachments.

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF AIR QUALITY

601 57th Street, SE
Charleston, WV 25304
(304) 926-0475
www.dep.wv.gov/daq

APPLICATION FOR NSR PERMIT AND TITLE V PERMIT REVISION (OPTIONAL)

PLEASE CHECK ALL THAT APPLY TO **NSR (45CSR13)** (IF KNOWN):

☐ **CONSTRUCTION** ☐ **MODIFICATION** ☐ **RELOCATION**
☐ **CLASS I ADMINISTRATIVE UPDATE** ☐ **TEMPORARY**
☒ **CLASS II ADMINISTRATIVE UPDATE** ☐ **AFTER-THE-FACT**

PLEASE CHECK TYPE OF **45CSR30 (TITLE V)** REVISION (IF ANY):

☐ **ADMINISTRATIVE AMENDMENT** ☐ **MINOR MODIFICATION**
☐ **SIGNIFICANT MODIFICATION**

IF ANY BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION INFORMATION AS **ATTACHMENT S** TO THIS APPLICATION

FOR TITLE V FACILITIES ONLY: Please refer to "Title V Revision Guidance" in order to determine your Title V Revision options (Appendix A, "Title V Permit Revision Flowchart") and ability to operate with the changes requested in this Permit Application.

Section I. General

1. Name of applicant *(as registered with the WV Secretary of State's Office):*
EQT Gathering, LLC

2. Federal Employer ID No. ***(FEIN):***
20-2752042

3. Name of facility *(if different from above):*
Janus Station

4. The applicant is the:
☐ **OWNER** ☐ **OPERATOR** ☒ **BOTH**

5A. Applicant's mailing address:
625 Liberty Avenue, Suite 1700
Pittsburgh, PA 15222

5B. Facility's present physical address:
Off Left Fork Run Road
Doddridge County, WV

6. **West Virginia Business Registration.** Is the applicant a resident of the State of West Virginia? ☒ **YES** ☐ **NO**

- If **YES,** provide a copy of the **Certificate of Incorporation/Organization/Limited Partnership** (one page) including any name change amendments or other Business Registration Certificate as **Attachment A.**
- If **NO,** provide a copy of the **Certificate of Authority/Authority of L.L.C./Registration** (one page) including any name change amendments or other Business Certificate as **Attachment A.**

7. If applicant is a subsidiary corporation, please provide the name of parent corporation: EQT Corporation

8. Does the applicant own, lease, have an option to buy or otherwise have control of the *proposed site?* ☒ **YES** ☐ **NO**

- If **YES,** please explain: Applicant owns site

- If **NO,** you are not eligible for a permit for this source.

9. Type of plant or facility (stationary source) to be **constructed, modified, relocated, administratively updated** or **temporarily permitted** (e.g., coal preparation plant, primary crusher, etc.): Natural Gas Compressor Station

10. North American Industry Classification System **(NAICS)** code for the facility:
211111

11A. DAQ Plant ID No. (for existing facilities only):
017 – 00158

11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):
R13-3269

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

12A.

- For **Modifications, Administrative Updates** or **Temporary permits** at an existing facility, please provide directions to the *present location* of the facility from the nearest state road;
- For **Construction** or **Relocation permits,** please provide directions to the *proposed new site location* from the nearest state road. Include a **MAP** as **Attachment B**.

Turn south off of RT 50 at MM 50.5 onto Arnolds Creek Rd. (Rt 11). Bear left in 0.7 miles onto Left Fork Run Rd. (RT 11/4). Turn right in 0.9 miles onto station road and proceed 0.9 miles up the hill to the Janus Station.

12.B. New site address (if applicable):	12C. Nearest city or town:	12D. County:
Arrnold's Creek Road	West Union	Doddridge
12.E. UTM Northing (KM): 4,345.400	12F. UTM Easting (KM): 516.767	12G. UTM Zone: 17

13. Briefly describe the proposed change(s) at the facility:
EQT is proposing to update the current permit limits on the storage vessels and vented emissions. Specifically, EQT would like to make the current Vapor Destruction Unit (VDU) an optional control on the tanks.

14A. Provide the date of anticipated installation or change: / / – If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen: / /	14B. Date of anticipated Start-Up if a permit is granted: ASAP

14C. Provide a **Schedule** of the planned **Installation** of/**Change** to and **Start-Up** of each of the units proposed in this permit application as **Attachment C** (if more than one unit is involved).

15. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application:
Hours Per Day 24 Days Per Week 7 Weeks Per Year 52

16. Is demolition or physical renovation at an existing facility involved? ☐ **YES** ☒ **NO**

17**. Risk Management Plans.** If this facility is subject to 112(r) of the 1990 CAAA, or will become subject due to proposed changes (for applicability help see www.epa.gov/ceppo), submit your **Risk Management Plan (RMP)** to U. S. EPA Region III.

18**. Regulatory Discussion.** List all Federal and State air pollution control regulations that you believe are applicable to the proposed process *(if known).* A list of possible applicable requirements is also included in Attachment S of this application (Title V Permit Revision Information). Discuss applicability and proposed demonstration(s) of compliance *(if known).* Provide this information as **Attachment D.**

Section II. Additional attachments and supporting documents.

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

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

21. Provide a **Plot Plan,** e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is or is to be located as **Attachment E** (Refer to ***Plot Plan Guidance***) **.**
– Indicate the location of the nearest occupied structure (e.g. church, school, business, residence).

22. Provide a **Detailed Process Flow Diagram(s)** showing each proposed or modified emissions unit, emission point and control device as **Attachment F.**

23. Provide a **Process Description** as **Attachment G.**
– Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).

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

24. Provide **Material Safety Data Sheets (MSDS)** for all materials processed, used or produced as **Attachment H.**

– For chemical processes, provide a MSDS for each compound emitted to the air.

25. Fill out the **Emission Units Table** and provide it as **Attachment I.**

26. Fill out the **Emission Points Data Summary Sheet (Table 1 and Table 2)** and provide it as **Attachment J.**

27. Fill out the **Fugitive Emissions Data Summary Sheet** and provide it as **Attachment K.**

28. Check all applicable **Emissions Unit Data Sheets** listed below:

☐ Bulk Liquid Transfer Operations	☐ Haul Road Emissions	☐ Quarry
☐ Chemical Processes	☐ Hot Mix Asphalt Plant	☐ Solid Materials Sizing, Handling and Storage Facilities
☐ Concrete Batch Plant	☐ Incinerator	☒ Storage Tanks
☐ Grey Iron and Steel Foundry	☐ Indirect Heat Exchanger	
☐ General Emission Unit, specify		

Fill out and provide the **Emissions Unit Data Sheet(s)** as **Attachment L.**

29. Check all applicable **Air Pollution Control Device Sheets** listed below:

☐ Absorption Systems	☐ Baghouse	☒ Flare – Tank Enclosed flare
☐ Adsorption Systems	☐ Condenser	☐ Mechanical Collector
☐ Afterburner	☐ Electrostatic Precipitator	☐ Wet Collecting System

☐ Other Collectors, specify

Fill out and provide the **Air Pollution Control Device Sheet(s)** as **Attachment M.**

30. Provide all **Supporting Emissions Calculations** as **Attachment N,** or attach the calculations directly to the forms listed in Items 28 through 31.

31. **Monitoring, Recordkeeping, Reporting and Testing Plans.** Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as **Attachment O.**

➢ Please be aware that all permits must be practically enforceable whether or not the applicant chooses to propose such measures. Additionally, the DAQ may not be able to accept all measures proposed by the applicant. If none of these plans are proposed by the applicant, DAQ will develop such plans and include them in the permit.

32. **Public Notice.** At the time that the application is submitted, place a **Class I Legal Advertisement** in a newspaper of general circulation in the area where the source is or will be located (See 45CSR§13-8.3 through 45CSR§13-8.5 and ***Example Legal Advertisement*** for details). Please submit the **Affidavit of Publication** as **Attachment P** immediately upon receipt.

33**. Business Confidentiality Claims.** Does this application include confidential information (per 45CSR31)?

☐ **YES** ☒ **NO**

➢ If **YES,** identify each segment of information on each page that is submitted as confidential and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's *"**Precautionary Notice – Claims of Confidentiality"*** guidance found in the ***General Instructions*** as **Attachment Q.**

Section III. Certification of Information

34. **Authority/Delegation of Authority.** Only required when someone other than the responsible official signs the application. Check applicable **Authority Form** below:

☐ Authority of Corporation or Other Business Entity	☐ Authority of Partnership
☐ Authority of Governmental Agency	☐ Authority of Limited Partnership

Submit completed and signed **Authority Form** as **Attachment R.**

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

35A. **Certification of Information.** To certify this permit application, a Responsible Official (per 45CSR§13-2.22 and 45CSR§30-2.28) or Authorized Representative shall check the appropriate box and sign below.

Certification of Truth, Accuracy, and Completeness

I, the undersigned ☒ **Responsible Official** / ☐ **Authorized Representative,** hereby certify that all information contained in this application and any supporting documents appended hereto, is true, accurate, and complete based on information and belief after reasonable inquiry I further agree to assume responsibility for the construction, modification and/or relocation and operation of the stationary source described herein in accordance with this application and any amendments thereto, as well as the Department of Environmental Protection, Division of Air Quality permit issued in accordance with this application, along with all applicable rules and regulations of the West Virginia Division of Air Quality and W.Va. Code § 22-5-1 et seq. (State Air Pollution Control Act). If the business or agency changes its Responsible Official or Authorized Representative, the Director of the Division of Air Quality will be notified in writing within 30 days of the official change.

Compliance Certification

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

SIGNATURE Diana M. Charletta *(Please use blue ink)* DATE: 6/27/16 *(Please use blue ink)*

35B. Printed name of signee: Diana Charletta		35C. Title: Sr. Vice President
35D. E-mail: dcharletta@eqt.com	36E. Phone:	36F. FAX:
36A. Printed name of contact person (if different from above): Alex Bosiljevac		36B. Title: Environmental Coordinator
36C. E-mail: abosiljevac@eqt.com	36D. Phone: 412-395-3699	36E. FAX: 412-395-7027

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

- ☒ **Attachment A: Business Certificate**
- ☒ **Attachment B: Map(s)**
- ☒ **Attachment C: Installation and Start Up Schedule**
- ☒ **Attachment D: Regulatory Discussion**
- ☒ **Attachment E: Plot Plan**
- ☒ **Attachment F: Detailed Process Flow Diagram(s)**
- ☒ **Attachment G: Process Description**
- ☐ **Attachment H: Material Safety Data Sheets (MSDS)**
- ☒ **Attachment I: Emission Units Table**
- ☒ **Attachment J: Emission Points Data Summary Sheet**
- ☒ **Attachment K: Fugitive Emissions Data Summary Sheet**
- ☒ **Attachment L: Emissions Unit Data Sheet(s)**
- ☒ **Attachment M: Air Pollution Control Device Sheet(s)**
- ☒ **Attachment N: Supporting Emissions Calculations**
- ☒ **Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans**
- ☒ **Attachment P: Public Notice**
- ☐ **Attachment Q: Business Confidential Claims**
- ☐ **Attachment R: Authority Forms**
- ☒ **Attachment S: Title V Permit Revision Information**
- ☒ **Application Fee**

Please mail an original and three (3) copies of the complete permit application with the signature(s) to the DAQ, Permitting Section, at the address listed on the first page of this application. Please DO NOT fax permit applications.

FOR AGENCY USE ONLY– IF THIS IS A TITLE V SOURCE:

- ☐ ***Forward 1 copy of the application to the Title V Permitting Group and:***
- ☐ ***For Title V Administrative Amendments:***
  - ☐ ***NSR permit writer should notify Title V permit writer of draft permit,***
- ☐ ***For Title V Minor Modifications:***
  - ☐ ***Title V permit writer should send appropriate notification to EPA and affected states within 5 days of receipt,***
  - ☐ ***NSR permit writer should notify Title V permit writer of draft permit.***
- ☐ ***For Title V Significant Modifications processed in parallel with NSR Permit revision:***
  - ☐ ***NSR permit writer should notify a Title V permit writer of draft permit,***
  - ☐ ***Public notice should reference both 45CSR13 and Title V permits,***
  - ☐ ***EPA has 45 day review period of a draft permit.***

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

ATTACHMENT A

Current Business Certificate

WEST VIRGINIA
STATE TAX DEPARTMENT

BUSINESS REGISTRATION
CERTIFICATE

ISSUED TO:
EQT GATHERING, LLC
225 N SHORE DR
PITTSBURGH, PA 15212-5860

BUSINESS REGISTRATION ACCOUNT NUMBER: **1010-2674**

This certificate is issued on: **06/28/2011**

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.4
L2077129856

ATTACHMENT B

Map

Figure 1 - Map of Janus Station

UTM Northing (KM): 4,345.000
UTM Easting (KM): 516.767
Elevation: 900 ft

ATTACHMENT C

Startup and Installation Schedule

ATTACHMENT C

Schedule of Planned Installation and Start-Up

The proposed changes will be implemented upon issuance of the revised permit. No installation is required by the proposed changes.

ATTACHMENT D

Regulatory Discussion

ATTACHMENT D – REGULATORY APPLICABILITY

This section documents the applicability determinations made for Federal and State air quality regulations. The monitoring, recordkeeping, reporting, and testing plan is presented in Attachment O. 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 R13 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 Janus Compressor Station. 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 Janus Compressor Station. Regulations that are categorically non-applicable are not discussed (e.g., NSPS Subpart J, Standards of Performance for Petroleum Refineries).

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) and new and modified sources of non-attainment pollutants under Non-Attainment New Source Review (NNSR). PSD and NNSR 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 Janus Compressor Station will remain a minor source with respect to the NSR program after the project since its potential emissions are below all the NNSR/PSD thresholds. As such, NNSR/PSD permitting is not triggered by this construction activity. EQT will monitor future construction activities at the site closely and will compare any future increase in emissions with the NSR/PSD thresholds to ensure these activities will not trigger this program.

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. Potential emissions of NO_X exceed 100 tpy. Therefore, the Janus Compressor Station will be continue to be a major source with respect to the Title V permit program and as such is required to submit a Title V operating permit application. EQT will submit the Title V operating permit application within one year of start-up of the facility.

New Source Performance Standards

New Source Performance Standards (NSPS), located in 40 CFR 60, require new, modified, or reconstructed sources to control emissions to the level achievable by the best demonstrated technology as specified in the applicable provisions. Moreover, any source subject to an NSPS is also subject to the general provisions of NSPS Subpart A, except where expressly noted. The following is a summary of applicability and non-applicability determinations for NSPS regulations of relevance to the proposed project at the Janus Compressor Station.

NSPS Subparts K, Ka, and Kb

These subparts apply to storage tanks of certain sizes constructed, reconstructed, or modified during various time periods. Subpart K applies to storage tanks constructed, reconstructed, or modified prior to 1978, and Subpart Ka applies to those constructed, reconstructed, or modified prior to 1984. Both Subparts K and Ka apply to storage tanks with a capacity greater than 40,000 gallons. Subpart Kb applies to volatile organic liquid (VOL) storage tanks constructed, reconstructed, or modified after July 23, 1984 with a capacity equal to or greater than 75 m3 (~19,813 gallons). The storage tanks at the Janus Compressor Station have a capacity of 19,000 gallons or less. As such, Subparts K, Ka, and Kb do not apply to the storage tanks at the Janus Compressor Station.

NSPS Subpart OOOO—Crude Oil and Natural Gas Production, Transmission, and Distribution

Subpart OOOO, Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution, applies to affected facilities that commenced construction, reconstruction, or modification after August 23, 2011 (see clarification below regarding dates). This NSPS was published in the Federal Register on August 16, 2012, and subsequently amended. Although there are sources proposed to be installed that could potentially be subject to this regulation, due to the anticipated installation dates, some will not be subject to the rule. This is due to the most recent proposed developments related to the rule, which are the inclusion of an end date for applicability to Subpart OOOO (September 18, 2015) and the promulgation of 40 CFR 60 Subpart OOOOa.

For this project, EQT is proposing to remove the enclosed combustor as the primary control for the two (2) produced storage tanks at the Janus Station. However, since VOC emissions are less than 6 tpy, these tanks will not be storage vessel affected facilities under this rule.

NSPS Subpart OOOOa—Crude Oil and Natural Gas Facilities

Subpart OOOOa, Standards of Standards of Performance for Crude Oil and Natural Gas Facilities, will apply to affected facilities that commenced construction, reconstruction, or modification after September 18, 2015. This regulation has yet to be finalized. The currently proposed version of the rule includes provisions for the following facilities:

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

Based on the current version of the proposed rule, the following paragraphs describe the potential applicability related to the proposed changes at the facility.

There are two (2) produced fluid storage vessels at the Janus Station. The storage tanks will be installed after the applicability date of Subpart OOOOa, and could therefore be potentially subject to the rule. The storage vessels at the facility each have potential VOC emissions less than 6 tpy based on the permit application materials and as such, per 60.5365a(e), the tanks will not be storage vessel affected facilities under the rule.

Non-Applicability of All Other NSPS

NSPS are developed for particular industrial source categories. Other than NSPS developed for natural gas operations (Subpart OOOO/OOOOa), and associated equipment (Subparts D-Dc, KKKK, and K-Kb), the applicability of a particular NSPS to the Janus Compressor Station can be readily ascertained based on the industrial source category covered. All other NSPS are categorically not applicable to natural gas compressor stations.

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. Note that Subpart HH has specific major source applicability criteria (i.e., excluding engine emissions from the major source determination). The Janus Compressor Station will be an Area (minor) source of HAP since its potential emissions of HAP are less than the 10/25 major source thresholds. The proposed project does not include any emission unit that is subject to NESHAP regulations. Therefore this part does not apply.

West Virginia SIP Regulations

The Janus Compressor Station 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).

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 Janus Compressor Station is generally subject to this requirement. However, due to the nature of the process at the station, production of objectionable odor from the compressor station during normal operation is unlikely.

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 tank enclosed flare is an incinerators and therefore must comply with this regulation. Per 45 CSR 6-4.3, opacity of emissions from this unit shall not exceed 20 percent, except as provided by 4.4. PM emissions from this unit will not exceed the levels calculated in accordance with 6-4.1

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 Janus Compressor Station (discussed earlier in this attachment), EQT will be complying with 45 CSR 16.

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.

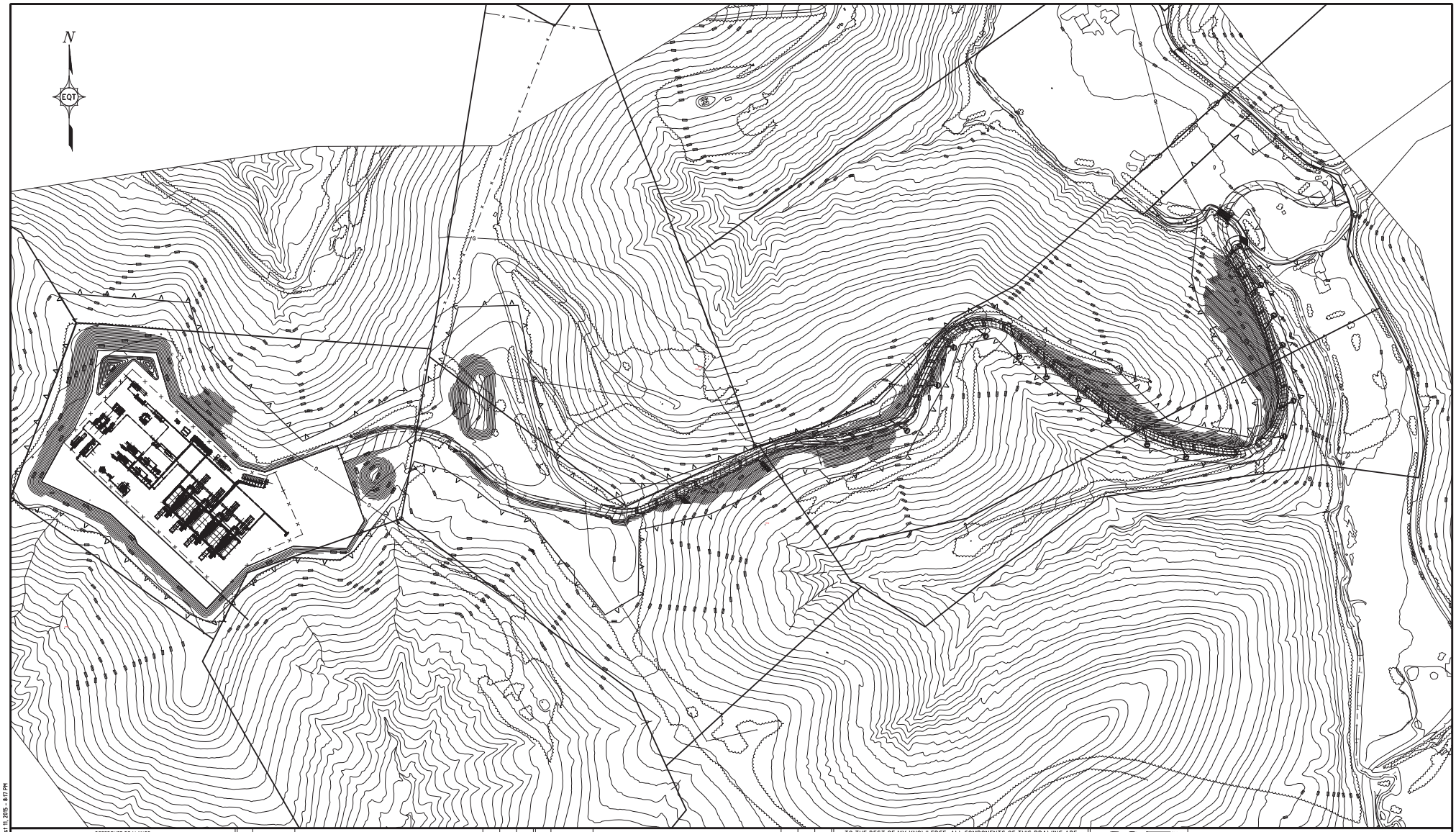
Due to the nature of the activities at the Janus Station it is unlikely that fugitive particulate matter emissions will be emitted under normal operating conditions. However, EQT will take measures to ensure any fugitive particulate matter emissions will not cross the property boundary should any such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

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 Janus Compressor Station is less than 40,000 gallons; therefore, 45 CSR 21-28 will not apply.

ATTACHMENT E

Plot Plan



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TO THE BEST OF MY KNOWLEDGE, ALL COMPONENTS OF THIS DRAWING ARE DESIGNED IN ACCORDANCE WITH APPLICABLE GUIDELINES AND SPECIFICATIONS

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MECHANICAL DESIGN ENGINEER	DATE
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ELECTRICAL DESIGN ENGINEER	DATE

NOTE: ANY CHANGES TO THE DESIGN SHOWN ON THIS DRAWING MUST BE APPROVED BY THE DESIGN ENGINEER.

EQT℠
DESIGN ENGINEERING

PROJECT ID

DRAWING SCALE: 1"=125'-0"

DRAWING TITLE:
JANUS COMPRESSOR STATION
2016 COMPRESSOR AND DEHY INSTALLATION

PLOT PLAN

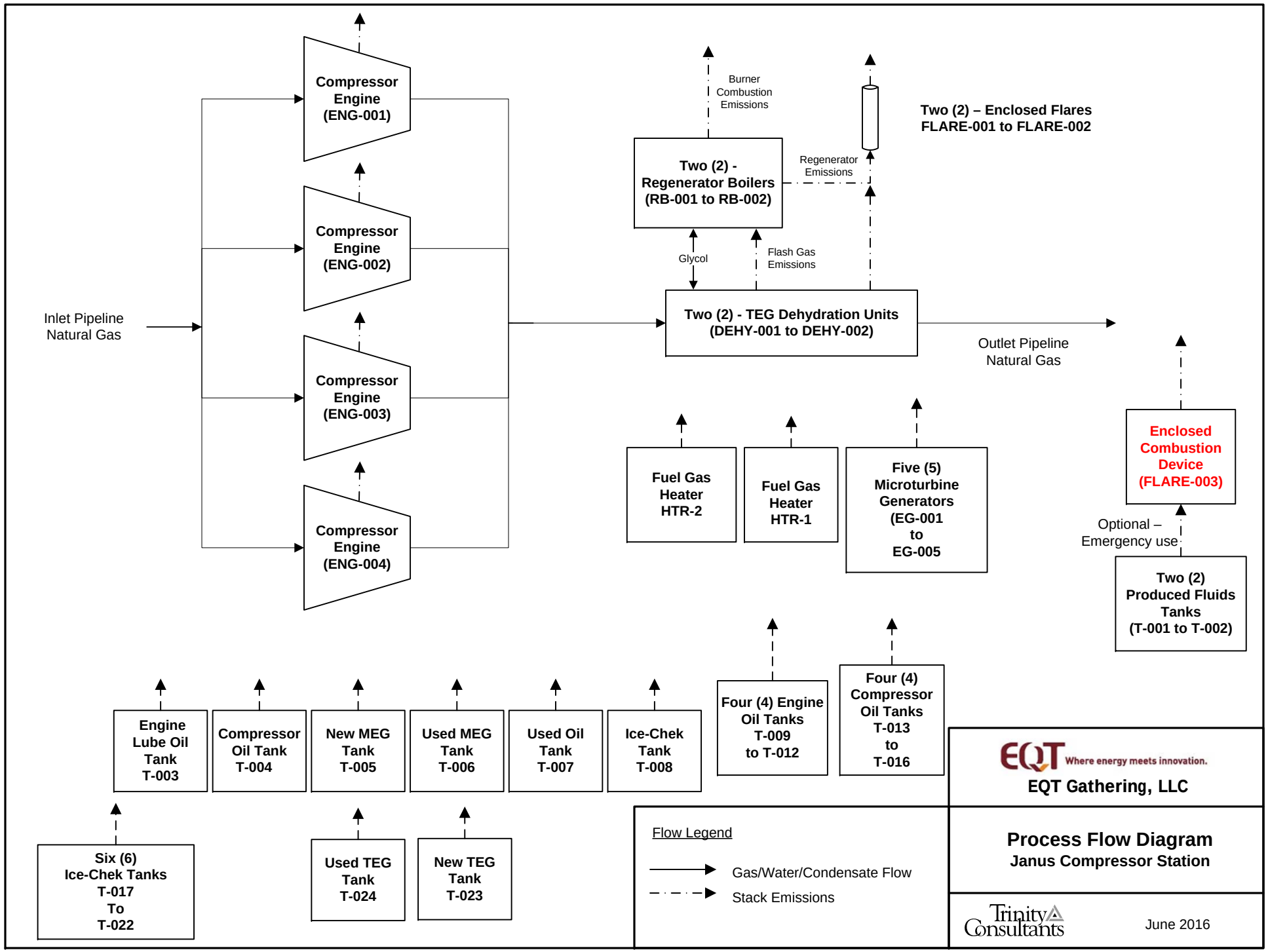
FACILITY	STATE	IDENTIFICATION	SERIES	SHEET	REVISION
C	W	JAN01	101	01	P

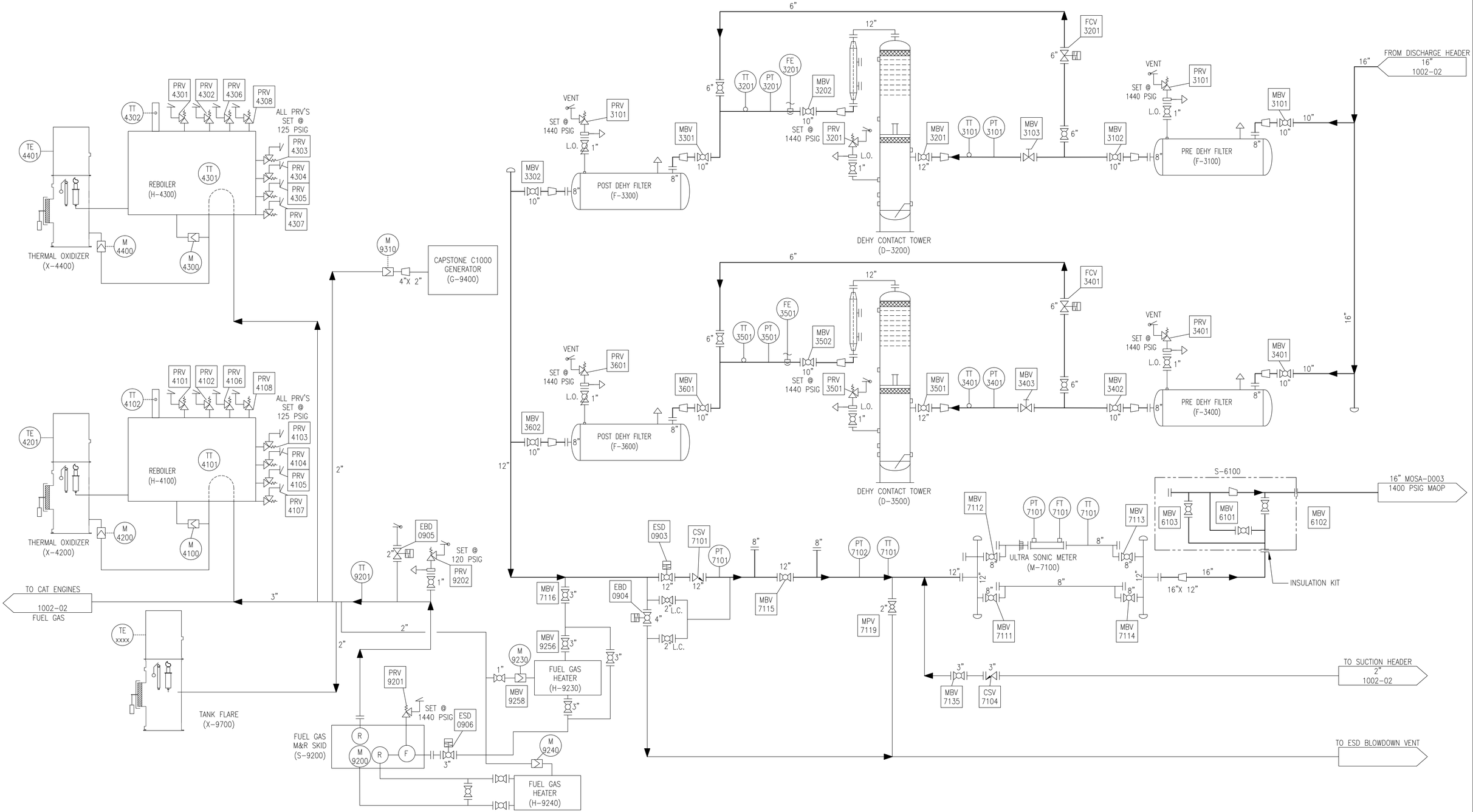
Plotted by: Gillespie, Steve on August 11, 2015 - 8:17 PM

File Path: C:\Vault Working\3D\Saturn\JAN01\Drawing Files\Design Files\Mechanical\JAN01-101-01.dwg

ATTACHMENT F

Detailed Process Flow Diagram


Compressor Engine (ENG-001)
Compressor Engine (ENG-002)
Compressor Engine (ENG-003)
Compressor Engine (ENG-004)
Inlet Pipeline Natural Gas
Burner Combustion Emissions
Two (2) - Regenerator Boilers (RB-001 to RB-002)
Regenerator Emissions
Two (2) – Enclosed Flares FLARE-001 to FLARE-002
Glycol
Flash Gas Emissions
Two (2) - TEG Dehydration Units (DEHY-001 to DEHY-002)
Outlet Pipeline Natural Gas
Fuel Gas Heater HTR-2
Fuel Gas Heater HTR-1
Five (5) Microturbine Generators (EG-001 to EG-005)
Enclosed Combustion Device (FLARE-003)
Optional – Emergency use
Two (2) Produced Fluids Tanks (T-001 to T-002)
Engine Lube Oil Tank T-003
Compressor Oil Tank T-004
New MEG Tank T-005
Used MEG Tank T-006
Used Oil Tank T-007
Ice-Chek Tank T-008
Four (4) Engine Oil Tanks T-009 to T-012
Four (4) Compressor Oil Tanks T-013 to T-016
Six (6) Ice-Chek Tanks T-017 To T-022
Used TEG Tank T-024
New TEG Tank T-023
Flow Legend
Gas/Water/Condensate Flow
Stack Emissions
EQT Where energy meets innovation.
EQT Gathering, LLC
Process Flow Diagram
Janus Compressor Station
Trinity Consultants
June 2016



REFERENCE DRAWINGS		NO.	DATE	REVISION	BY	CHK	APPD	NO.	DATE	REVISION	BY	CHK	APPD
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TO THE BEST OF MY KNOWLEDGE, ALL COMPONENTS OF THIS DRAWING ARE DESIGNED IN ACCORDANCE WITH APPLICABLE GUIDELINES AND SPECIFICATIONS

MATTHEW PETERSON — MECHANICAL DESIGN ENGINEER — DATE

– — ELECTRICAL DESIGN ENGINEER — DATE

NOTE: ANY CHANGES TO THE DESIGN SHOWN ON THIS DRAWING MUST BE APPROVED BY THE DESIGN ENGINEER.

EQT SM
DESIGN ENGINEERING

PROJECT ID: C316

DRAWING SCALE: NONE

DRAWING TITLE:
PANDORA COMPRESSOR STATION
2015 COMPRESSOR AND DEHY INSTALLATION
PROCESS FLOW DIAGRAM

FACILITY	STATE	IDENTIFICATION	SERIES	SHEET	REVISION
C	W	PAN01	1002	03	P

Plotted by Gillespie, Steve on August 11, 2015 - 8:22 PM

File Path: C:\Vault Working\3D\Saturn\JAN01\Drawing Files\Design Files\Mechanical\PFD\C-W-JAN01-1002-03.dwg

ATTACHMENT G

Process Description

ATTACHMENT G – PROCESS DESCRIPTION

EQT is submitting this Class II application to update the permit for the Janus Station. Specifically, EQT seeks to designate the existing enclosed flare (FLARE-003) associated with the produced water tanks as an optional control for emergency use. Additionally, this application involves the update of blowdown and station venting emission calculations as well.

Natural gas enters the station via the gathering pipeline system and is compressed using one of the four (4) natural gas-fired compressor engines (identified as ENG-1 to ENG-4, each rated at 5,350 hp). The compressed natural gas stream is then processed through the triethylene glycol (TEG) dehydration units (with associated reboilers). The dehydration units will introduce TEG to the gas stream in a contact tower to absorb water vapor from the gas to a level not exceeding 7 pounds per million standard cubic feet (lb/MMscf). The TEG is then sent to the natural gas-fired reboilers, each rated at 2.3 MMBtu/hr heat input. The water is evaporated from the TEG in the reboiler and discharged, and the glycol is then sent back to the contact tower for reuse. Each dehydration unit is equipped with an enclosed flare which will control emissions from the dehydration still vent and emissions from the flash tank. The natural gas stream from the contact tower flows into the pipeline to be transported further along the pipeline system.

The station is also equipped with two (2) fuel gas heaters, two (2) produced fluids storage tanks, and twenty two (22) miscellaneous storage tanks. Once the tanks are filled, the contents are loaded into trucks for transport. Electricity at the station will be provided by the five (5) Capstone microturbine generators.

A process flow diagram is included as Attachment F.

ATTACHMENT I

Emission Units Table

Attachment I

Emission Units Table

(includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device [4]
ENG-001	ENG-001	Caterpillar G3616 Compressor Engine #1	2016	5,350 HP	Existing	Ox. Cat. (C1)
ENG-002	ENG-002	Caterpillar G3616 Compressor Engine #2	2016	5,350 HP	Existing	Ox. Cat. (C2)
ENG-003	ENG-003	Caterpillar G3616 Compressor Engine #3	2016	5,350 HP	Existing	Ox. Cat. (C3)
ENG-004	ENG-004	Caterpillar G3616 Compressor Engine #4	2016	5,350 HP	Existing	Ox. Cat. (C4)
DEHY-001	FLARE-001	Dehydration Unit #1	2016	125 MMscfd	Existing	Enclosed Flare (FLARE-001)
DEHY-002	FLARE-002	Dehydration Unit #2	2016	125 MMscfd	Existing	Enclosed Flare (FLARE-002)
RB-001	RB-001	Dehydration Unit Reboiler #1	2016	2.31 MMBtu/hr	Existing	N/A
RB-002	RB-002	Dehydration Unit Reboiler #2	2016	2.31 MMBtu/hr	Existing	N/A
EG-001	EG-001	Microturbine Generator	2016	200 KW	Existing	N/A
EG-002	EG-002	Microturbine Generator	2016	200 KW	Existing	N/A
EG-003	EG-003	Microturbine Generator	2016	200 KW	Existing	N/A
EG-004	EG-004	Microturbine Generator	2016	200 KW	Existing	N/A
EG-005	EG-005	Microturbine Generator	2016	200 KW	Existing	N/A
HTR-1	HTR-1	Fuel Gas Heater	2016	1.15 MMBtu/hr	Existing	N/A
HTR-2	HTR-2	Fuel Gas Heater	2016	0.77 MMBtu/hr	Existing	N/A
T-001	Enclosed Flare (FLARE-003) – Optional	Produced Fluids Tank	2016	8,820 gallons	Modified	Enclosed Flare (FLARE-003) – Optional
T-002	Enclosed Flare (FLARE-003) – Optional	Produced Fluids Tank	2016	8,820 gallons	Modified	Enclosed Flare (FLARE-003) – Optional
T-003	T-003	Engine Lube Oil Tank	2016	2,000 gallons	Existing	N/A
T-004	T-004	Compressor Oil Tank	2016	2,000 gallons	Existing	N/A
T-005	T-005	New MEG Tank	2016	2,000 gallons	Existing	N//A
T-006	T-006	Used MEG Tank	2016	2,000 gallons	Existing	N/A
T-007	T-007	Used Oil Tank	2016	4,200 gallons	Existing	N/A
T-008	T-008	Ice-chek Tank	2016	4,000 gallons	Existing	N/A
T-009	T-009	Engine Oil Tank	2016	300 gallons	Existing	N/A

T-010	T-010	Engine Oil Tank	2016	300 gallons	Existing	N/A
T-011	T-011	Engine Oil Tank	2016	300 gallons	Existing	N/A
T-012	T-012	Engine Oil Tank	2016	300 gallons	Existing	N/A
T-013	T-013	Compressor Oil Tank	2016	300 gallons	Existing	N/A
T-014	T-014	Compressor Oil Tank	2016	300 gallons	Existing	N/A
T-015	T-015	Compressor Oil Tank	2016	300 gallons	Existing	N/A
T-016	T-016	Compressor Oil Tank	2016	300 gallons	Existing	N/A
T-017	T-017	Ice-chek Tank	2016	550 gallons	Existing	N/A
T-018	T-018	Ice-chek Tank	2016	550 gallons	Existing	N/A
T-019	T-019	Ice-chek Tank	2016	550 gallons	Existing	N/A
T-020	T-020	Ice-chek Tank	2016	550 gallons	Existing	N/A
T-021	T-021	Ice-chek Tank	2016	550 gallons	Existing	N/A
T-022	T-022	Ice-chek Tank	2016	550 gallons	Existing	N/A
T-023	T-023	New TEG Tank	2016	2,000 gallons	Existing	N//A
T-024	T-024	Used TEG Tank	2016	2,000 gallons	Existing	N/A
FLARE-001	FLARE-001	Dehy Enclosed Flare #1	2016	7 MMBtu/hr	Existing	N/A
FLARE-002	FLARE-002	Dehy Enclosed Flare #2	2016	7 MMBtu/hr	Existing	N/A
FLARE-003	FLARE-003	Tank Enclosed Flare #3	2016	41 MMBtu/hr	Existing	N/A
L1	L1	Liquid Loading	2016	210,000 gal/yr	Existing	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] New, modification, removal
[4] For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.

ATTACHMENT J

Emission Points Data Summary Sheet

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions [4]		Maximum Potential Controlled Emissions [5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used [6]	Emission Concentration [7] (ppmv or mg/m[4])
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
ENG-001 to ENG-004 (Each unit)	Upward Vertical stack	ENG-001 to ENG-004	Compressor Engine (Each unit)	C-1	Oxidation Catalyst	NA	NA	NOx CO VOC SO2 PM/PM10/PM2.5 HAPs CO2e	5.90 29.13 8.85 0.02 0.003 2.96 5,741	25.83 127.60 38.75 0.10 0.01 12.96 25,144	5.90 2.04 3.93 0.02 0.003 0.84 5,741	25.83 8.93 17.23 0.10 0.01 3.66 25,144	Gas/Vapor	O[A] O[A] O[A] O[B] O[B] O[A,B] O[A,C]	
FLARE-001 & FLARE-002 (Each unit)	Upward Vertical Stack	DEHY-001 & DEHY-002	Dehydration Unit (Each Unit)	FLARE-001 to FLARE - 002	Enclosed Flares	NA	NA	VOC HAP Benzene	77.61 33.76 4.11	339.92 147.88 18.02	1.55 0.68 0.08	6.80 2.96 0.36	Gas/Vapor	O[D]	
RB-001 & RB-002 (Each unit)	Upward Vertical Stack	RB-001 & RB-002	Reboiler	NA	NA	NA	NA	NOx CO PM/PM10/PM2.5 SO2 VOC CO2e	0.19 0.16 0.01 <0.01 0.01 271	0.83 0.69 0.06 <0.01 0.05 1,185	0.19 0.16 0.01 <0.01 0.01 271	0.83 0.69 0.06 <0.01 0.05 1,185	Gas/Vapor	O[F] O[F] O[F] O[F] O[F] O[C]	
FLARE-001 & FLARE-002 (Each unit)	Upward Vertical Stack	FLARE-001 & FLARE-002	Dehy Enclosed Flares (Each unit)	NA	NA	NA	NA	NOx CO PM/PM10/PM2.5 SO2 CO2e	0.58 0.49 0.04 <0.01 830	2.53 2.13 0.19 0.02 3,637	0.58 0.49 0.04 <0.01 830	2.53 2.13 0.19 0.02 3,637	Gas/Vapor	O[F] O[F] O[F] O[F] O[C]	
FLARE-003 (Optional) Or T-001 & T-002	Upward Vertical Stack	T-001 & T-002 (Each unit)	Produced Fluids Storage Tank	FLARE-003 (Option)	Enclosed Flares	NA	NA	VOC HAP	0.96 0.02	4.19 0.10	0.96 0.02	4.19 0.10	Gas/Vapor	O[E]	
FLARE-003	Upward Vertical Stack	FLARE-003	Tank Enclosed Flare	NA	NA	NA	NA	NOx CO PM/PM10 SO2 CO2e	3.35 2.82 0.25 0.02 4,816	14.69 12.34 1.12 0.09 21,095	3.35 2.82 0.25 0.02 4,816	14.69 12.34 1.12 0.09 21,095	Gas/Vapor	O[F] O[F] O[F] O[F] O[C]	
L1	Fugitive	L1	Liquid Loading	NA	NA	NA	NA	VOC	NA	0.09	NA	0.09	Gas/Vapor	O[H]	

HTR-1	Upward Vertical stack	HTR-1	Fuel Gas Heater	NA	NA	NA	NA	NOx CO VOC SO2 PM/PM10/PM2.5 CO2e	0.09 0.08 0.01 <0.01 0.01 135	0.41 0.35 0.02 <0.01 0.02 590	0.09 0.08 0.01 <0.01 0.01 135	0.41 0.35 0.02 <0.01 0.02 590	Gas/Vapor	O[F] O[F] O[F] O[F] O[F] O[C]	
HTR-2	Upward Vertical stack	HTR-2	Fuel Gas Heater	NA	NA	NA	NA	NOx CO VOC SO2 PM/PM10/PM2.5 CO2e	0.06 0.05 <0.01 <0.01 <0.01 90	0.28 0.23 <0.01 <0.01 <0.01 395	0.06 0.05 <0.01 <0.01 <0.01 90	0.28 0.23 <0.01 <0.01 <0.01 395	Gas/Vapor	O[F] O[F] O[F] O[F] O[F] O[C]	
EG-001 to EG-005 (Combined)	Upward Vertical stack	EG-001 to EG-005	Microturbine	NA	NA	NA	NA	NOx CO VOC SO2 PM/PM10/PM2.5 HAPs CO2e	0.40 1.10 0.10 0.04 0.08 0.01 1,331	1.75 4.82 0.44 0.17 0.33 0.05 5,831	0.40 1.10 0.10 0.04 0.08 0.01 1,331	1.75 4.82 0.44 0.17 0.33 0.05 5,831	Gas/Vapor	O[A] O[A] O[A] O[G] O[G] O[G] O[A,C]	

A- Manufacturer's specific pollutant emission Factor
B- AP-42 Section 3.2, Table 3.2-2 "Uncontrolled Emission Factors for 4-Stroke Lean-Burn Engines" Supplement F, August 2000, except for Formaldehyde which is manufacturer's spec.
C- 40 CFR 98, Subpart C for natural gas fired combustion.
D- GRI-GLYCalc
E- API E&PTanks
F- AP-42 Section 1.4 Tables 1.4-1, 1.4-2 and 1.4-3, July 1998.
G- AP-42 Section 3.1 Table 3.1-2a
H- AP-42 Section 5.2 Table 5.2-1

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

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

[2] Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

[3] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. **DO NOT LIST** H_2, H_2O, N_2, O_2, and Noble Gases.

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

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

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

[7] Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m^3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO_2, use units of ppmv (See 45CSR10).

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 2: Release Parameter Data								
Emission Point ID No. *(Must match Emission Units Table)*	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (^{o}F)	Volumetric Flow [1] (acfm) *at operating conditions*	Velocity (fps)	Ground Level *(Height above mean sea level)*	Stack Height [2] *(Release height of emissions above ground level)*	Northing	Easting

[1] Give at operating conditions. Include inerts.
[2] Release height of emissions above ground level.

ATTACHMENT K

Fugitive Emissions Data Summary Sheet

Attachment K

FUGITIVE EMISSIONS DATA SUMMARY SHEET

The FUGITIVE EMISSIONS SUMMARY SHEET provides a summation of fugitive emissions. Fugitive emissions are those emissions which could not reasonably pass through a stack, chimney, vent or other functionally equivalent opening. Note that uncaptured process emissions are not typically considered to be fugitive, and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET.

Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions).

APPLICATION FORMS CHECKLIST - FUGITIVE EMISSIONS
1.) Will there be haul road activities? ☐ Yes ☒ No (Not associated with this project) ☐ If YES, then complete the HAUL ROAD EMISSIONS UNIT DATA SHEET.
2.) Will there be Storage Piles? ☐ Yes ☒ No ☐ If YES, complete Table 1 of the NONMETALLIC MINERALS PROCESSING EMISSIONS UNIT DATA SHEET.
3.) Will there be Liquid Loading/Unloading Operations? ☐ Yes ☒ No (Not associated with this project) ☐ If YES, complete the BULK LIQUID TRANSFER OPERATIONS EMISSIONS UNIT DATA SHEET.
4.) Will there be emissions of air pollutants from Wastewater Treatment Evaporation? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
5.) Will there be Equipment Leaks (e.g. leaks from pumps, compressors, in-line process valves, pressure relief devices, open-ended valves, sampling connections, flanges, agitators, cooling towers, etc.)? ☒ Yes ☐ No ☒ If YES, complete the LEAK SOURCE DATA SHEET section of the CHEMICAL PROCESSES EMISSIONS UNIT DATA SHEET.
6.) Will there be General Clean-up VOC Operations? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
7.) Will there be any other activities that generate fugitive emissions? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET or the most appropriate form.
If you answered "NO" to all of the items above, it is not necessary to complete the following table, "Fugitive Emissions Summary."

FUGITIVE EMISSIONS SUMMARY	All Regulated Pollutants - Chemical Name/CAS [1]	Maximum Potential Uncontrolled Emissions [2]		Maximum Potential Controlled Emissions [3]		Est. Method Used [4]
		lb/hr	ton/yr	lb/hr	ton/yr	
Haul Road/Road Dust Emissions Paved Haul Roads	NA	--	--	--	--	--
Unpaved Haul Roads	NA	--	--	--	--	--
Storage Pile Emissions	NA	---	---	---	---	---
Loading/Unloading Operations	NA	---	---	---	---	---
Wastewater Treatment Evaporation & Operations	NA	---	---	---	---	---
Equipment Leaks (includes blowdowns and maintenance)	VOC HAP	N/A	30.80 1.69	N/A	30.80 1.69	O[A]
General Clean-up VOC Emissions	NA	---	---	---	---	---
Other	NA	---	---	---	---	---

A – Oil *and Gas Production Operations Average Emission Factors*, Protocol for Equipment Leak Emission Estimates, EPA 453/R-95-017, Table 2-4, November 1995, 40 CFR 98 Subpart W, and mass balance.

[1] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. DO NOT LIST H_2, H_2O, N_2, O_2, and Noble Gases.

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

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

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

LEAK-SOURCE DATA SHEET

Source Category	Pollutant	Number of Source Components[1]	Number of Components Monitored by Frequency[2]	Average Time to Repair (days)[3]	Estimated Annual Emission Rate (lb/yr)[4]
Pumps[5]	light liquid VOC[6,7]				
	heavy liquid VOC[8]				
	Non-VOC[9]				
Valves[10]	Gas VOC	700	0		11,292
	Light Liquid VOC				
	Heavy Liquid VOC				
	Non-VOC				
Safety Relief Valves[11]	Gas VOC				
	Non VOC				
Open-ended Lines[12]	VOC	12	0		86
	Non-VOC				
Sampling Connections[13]	VOC	650	0		466
	Non-VOC				
Compressors	VOC				
	Non-VOC				
Flanges	VOC	250	0		350
	Non-VOC				
Other	VOC				
	Non-VOC				

[1 - 13] See notes on the following page.

Notes for Leak Source Data Sheet

1. For VOC sources include components on streams and equipment that contain greater than 10% w/w VOC, including feed streams, reaction/separation facilities, and product/by-product delivery lines. Do not include certain leakless equipment as defined below by category.

2. By monitoring frequency, give the number of sources routinely monitored for leaks, using a portable detection device that measures concentration in ppm. Do not include monitoring by visual or soap-bubble leak detection methods. "M/Q(M)/Q/SA/A/O" means the time period between inspections as follows:

   Monthly/Quarterly, with Monthly follow-up of repaired leakers/Quarterly/Semi-annual/Annually/Other (specify time period)

   If source category is not monitored, a single zero in the space will suffice. For example, if 50 gas-service valves are monitored quarterly, with monthly follow-up of those repaired, 75 are monitored semi-annually, and 50 are checked bimonthly (alternate months), with non checked at any other frequency, you would put in the category "valves, gas service:" 0/50/0/75/0/50 (bimonthly).

3. Give the average number of days, after a leak is discovered, that an attempt will be made to repair the leak.

4. Note the method used: MB - material balance; EE - engineering estimate; EPA - emission factors established by EPA (cite document used); O - other method, such as in-house emission factor (specify).

5. Do not include in the equipment count sealless pumps (canned motor or diaphragm) or those with enclosed venting to a control device. (Emissions from vented equipment should be included in the estimates given in the Emission Points Data Sheet.)

6. Volatile organic compounds (VOC) means the term as defined in 40 CFR □51.100 (s).

7. A light liquid is defined as a fluid with vapor pressure equal to or greater than 0.04 psi (0.3 Kpa) at 20°C. For mixtures, if 20% w/w or more of the stream is composed of fluids with vapor pressures greater than 0.04 psi (0.3 Kpa) at 20 °C, then the fluid is defined as a light liquid.

8. A heavy liquid is defined as a fluid with a vapor pressure less than 0.04 psi (0.3 Kpa) at 20°C. For mixtures, if less than 20% w/w of the stream is composed of fluids with vapor pressures greater than 0.04 psi (0.3 Kpa) at 20 °C, then the fluid is defined as a heavy liquid.

9. LIST CO, H_2S, mineral acids, NO, NO_2, SO_3, etc. DO NOT LIST CO_2, H_2, H_2O, N_2, O_2, and Noble Gases.

10. Include all process valves whether in-line or on an open-ended line such as sample, drain and purge valves. Do not include safety-relief valves, or leakless valves such as check, diaphragm, and bellows seal valves.

11. Do not include a safety-relief valve if there is a rupture disk in place upstream of the valve, or if the valve vents to a control device.

12 Open-ended lines include purge, drain and vent lines. Do not include sampling connections, or lines sealed by plugs, caps, blinds or second valves.

13. Do not include closed-purge sampling connections.

ATTACHMENT L

Emission Unit Data Sheet

Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA'S TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT **www.epa.gov/tnn/tanks.html**), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA'S AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (**http://www.epa.gov/tnn/chief/**).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name Janus Compressor Station	2. Tank Name Produced Fluids Storage Tanks
3. Tank Equipment Identification No. (as assigned on *Equipment List Form*) T-001 & T-002	4. Emission Point Identification No. (as assigned on *Equipment List Form*) FLARE-003 (Optional)
5. Date of Commencement of Construction (for existing tanks)	
6. Type of change ☒ New Construction ☐ New Stored Material ☐ Other Tank Modification	
7. Description of Tank Modification (if applicable) Not Applicable	
7A. Does the tank have more than one mode of operation? (e.g. Is there more than one product stored in the tank?) ☐ Yes ☒ No	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode).	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.): None	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. T-001 & T-002: 210 bbl (each)	
9A. Tank Internal Diameter (ft) ~10	9B. Tank Internal Height (or Length) (ft) ~15
10A. Maximum Liquid Height (ft) ~15	10B. Average Liquid Height (ft) ~ 10
11A. Maximum Vapor Space Height (ft) ~15	11B. Average Vapor Space Height (ft) ~5
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. 210 bbl (each)	

13A. Maximum annual throughput (gal/yr)	13B. Maximum daily throughput (gal/day)
210,000 (Total)	575 (Total)

14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume)
24 (Total)

15. Maximum tank fill rate (gal/min) TBD

16. Tank fill method ☐ Submerged ☒ Splash ☐ Bottom Loading

17. Complete 17A and 17B for Variable Vapor Space Tank Systems ☐ Does Not Apply

17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year
TBD	TBD

18. Type of tank (check all that apply):
☒ Fixed Roof _x_ vertical __ horizontal ___ flat roof _x_ cone roof ___ dome roof
___ other (describe)
☐ External Floating Roof ___ pontoon roof ___ double deck roof
☐ Domed External (or Covered) Floating Roof
☐ Internal Floating Roof ___ vertical column support ___ self-supporting
☐ Variable Vapor Space ___ lifter roof ___ diaphragm
☐ Pressurized ___ spherical ___ cylindrical
☐ Underground
☐ Other (describe)

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary Sheets)

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

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

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

22A. Is the tank heated? ☐ YES ☒ NO

22B. If YES, provide the operating temperature (°F)

22C. If YES, please describe how heat is provided to tank.

23. Operating Pressure Range (psig): -0.30 to 0.75 psig

24. Complete the following section for **Vertical Fixed Roof Tanks** ☐ Does Not Apply

24A. For dome roof, provide roof radius (ft)

24B. For cone roof, provide slope (ft/ft) 0.0625

25. Complete the following section 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; indicate the number of each type of fitting:

ACCESS HATCH		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:

AUTOMATIC GAUGE FLOAT WELL		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:

COLUMN WELL		
BUILT-UP COLUMN – SLIDING COVER, GASKETED:	BUILT-UP COLUMN – SLIDING COVER, UNGASKETED:	PIPE COLUMN – FLEXIBLE FABRIC SLEEVE SEAL:

LADDER WELL	
PIP COLUMN – SLIDING COVER, GASKETED:	PIPE COLUMN – SLIDING COVER, UNGASKETED:

GAUGE-HATCH/SAMPLE PORT	
SLIDING COVER, GASKETED:	SLIDING COVER, UNGASKETED:

ROOF LEG OR HANGER WELL		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)

VACUUM BREAKER	
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:

RIM VENT	
WEIGHTED MECHANICAL ACTUATION GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:

DECK DRAIN (3-INCH DIAMETER)	
OPEN:	90% CLOSED:

STUB DRAIN
1-INCH DIAMETER:

OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)

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 feet wide ☐ Continuous sheet construction 6 feet wide ☐ Continuous sheet construction 7 feet wide ☐ Continuous sheet construction 5 × 7.5 feet wide ☐ Continuous sheet construction 5 × 12 feet wide ☐ Other (describe)	
26D. Deck seam length (ft)	26E. Area of deck (ft^2)
For column supported tanks: 26F. Number of columns:	26G. Diameter of each column:

IV. SITE INFORMANTION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based. Huntington, WV
28. Daily Average Ambient Temperature (°F)
29. Annual Average Maximum Temperature (°F) 65.3
30. Annual Average Minimum Temperature (°F) 45
31. Average Wind Speed (miles/hr) 6.6
32. Annual Average Solar Insulation Factor (BTU/(ft^2·day)) 1,176
33. Atmospheric Pressure (psia) 14.33

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid: 56.74	
34A. Minimum (°F)	34B. Maximum (°F) 61.79
35. Average operating pressure range of tank:	
35A. Minimum (psig)	35B. Maximum (psig)
36A. Minimum Liquid Surface Temperature (°F)	36B. Corresponding Vapor Pressure (psia)
37A. Average Liquid Surface Temperature (°F) 56.74	37B. Corresponding Vapor Pressure (psia)
38A. Maximum Liquid Surface Temperature (°F) 61.79	38B. Corresponding Vapor Pressure (psia)

39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.

39A.	Material Name or Composition	Produced Fluids		
39B.	CAS Number	TBD		
39C.	Liquid Density (lb/gal)	TBD		
39D.	Liquid Molecular Weight (lb/lb-mole)	TBD		
39E.	Vapor Molecular Weight (lb/lb-mole)	36.25		

Maximum Vapor Pressure 39F. True (psia) 39G. Reid (psia)	TBD TBD		
Months Storage per Year 39H. From 39I. To			

VI. EMISSIONS AND CONTROL DEVICE DATA (required)

40. Emission Control Devices (check as many as apply): ☐ Does Not Apply

- ☐ Carbon Adsorption[1]
- ☐ Condenser[1]
- ☒ Conservation Vent (psig) – Enardo Valve
  - Vacuum Setting 0.30 Pressure Setting 0.75
- ☐ Emergency Relief Valve (psig)
- ☐ Inert Gas Blanket of
- ☐ Insulation of Tank with
- ☐ Liquid Absorption (scrubber)[1]
- ☐ Refrigeration of Tank
- ☐ Rupture Disc (psig)
- ☒ Vent to Incinerator (optional)[1]
- ☐ Other[1] (describe):

[1] Complete appropriate Air Pollution Control Device Sheet.

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

Material Name & CAS No.	Breathing Loss (lb/hr)	Working Loss Amount	Working Loss Units	Annual Loss (lb/yr)	Estimation Method[1]
See attached Emissions Calculation					

[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 if applicable.

ATTACHMENT M

Air Pollution Control Device Sheet

Attachment M
Air Pollution Control Device Sheet
(FLARE SYSTEM)

Control Device ID No. (must match Emission Units Table): FLARE-003

Equipment Information

1. Manufacturer: Envirotherm (or similar)
Model No. EF-96-30 (or similar)

2. Method:
- ☐ Elevated flare
- ☐ Ground flare
- ☒ Other
  Describe Tank Enclosed Flare

3. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.

4. Method of system used:
☐ Steam-assisted ☐ Air-assisted ☒ Pressure-assisted ☐ Non-assisted

5. Maximum capacity of flare:
scf/min
scf/hr

6. Dimensions of stack:
Diameter 8 ft.
Height 30 ft.

7. Estimated combustion efficiency:
(Waste gas destruction efficiency)
Estimated: > 95 %
Minimum guaranteed: > 95 %

8. Fuel used in burners:
- ☒ Natural Gas
- ☐ Fuel Oil, Number
- ☐ Other, Specify:

9. Number of burners: One (1)
Rating: 41 MMBTU/hr

10. Will preheat be used? ☐ Yes ☐ No

11. Describe method of controlling flame:

12. Flare height: 30 ft

13. Flare tip inside diameter: 8 ft

14. Natural gas flow rate to flare pilot flame per pilot light:
scf/min
100 scf/hr

15. Number of pilot lights: One (1)
Total 0.12 MMBTU/hr

16. Will automatic re-ignition be used?
☒ Yes ☐ No

17. If automatic re-ignition will be used, describe the method:
The pilot flare will re-ignite upon pilot failure

18. Is pilot flame equipped with a monitor? ☒ Yes ☐ No
If yes, what type?
- ☒ Thermocouple
- ☐ Infra-Red
- ☐ Ultra Violet
- ☐ Camera with monitoring control room
- ☐ Other, Describe:

19. Hours of unit operation per year: 8760 (optional)

Steam Injection

20. Will steam injection be used? ☐ Yes ☒ No	21. Steam pressure PSIG Minimum Expected: Design Maximum:
22. Total Steam flow rate: LB/hr	23. Temperature: °F
24. Velocity ft/sec	25. Number of jet streams
26. Diameter of steam jets: in	27. Design basis for steam injected: LB steam/LB hydrocarbon
28. How will steam flow be controlled if steam injection is used?	

Characteristics of the Waste Gas Stream to be Burned

29.

Name	Quantity Grains of H_2S/100 ft^3	Quantity (LB/hr, ft^3/hr, etc)	Source of Material
See attached emissions calculations			

30. Estimate total combustible to flare:		LB/hr
(Maximum mass flow rate of waste gas)	338	scfm (20,280 scfh)
31. Estimated total flow rate to flare including materials to be burned, carrier gases, auxiliary fuel, etc.:		
32. Give composition of carrier gases:		

33. Temperature of emission stream: >70 °F Heating value of emission stream: 1,951 BTU/ft^3 Mean molecular weight of emission stream: MW = lb/lb-mole	34. Identify and describe all auxiliary fuels to be burned. BTU/scf BTU/scf BTU/scf BTU/scf BTU/scf
35. Temperature of flare gas: 1800 °F	36. Flare gas flow rate: 625 scf/min (37,500 scfh)
37. Flare gas heat content: 1,951 BTU/ft^3	38. Flare gas exit velocity: 125 ft/sec
39. Maximum rate during emergency for one major piece of equipment or process unit:	scf/min
40. Maximum rate during emergency for one major piece of equipment or process unit:	BTU/min
41. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):	
42. Describe the collection material disposal system:	
43. Have you included ***Flare Control Device*** in the Emissions Points Data Summary Sheet?	

44. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
Presence of pilot (temperature)	Maintain records of the times and duration of all periods where the pilot flame was absent Maintain records of visible emission opacity tests
REPORTING:	TESTING:
None	Conduct a Method 22 opacity test as required

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

45. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
VOC – 100%
HAP – 100%

46. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
VOC – 95%
HAP – 95%

47. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.

Technical Summary

Design Condition

Process inlet stream:

Bullet Tank Flash GasStream #1

Pipe Size:	4” Sch 40
Inlet Pressure:	0-90 PSIG
Volume Max:	20,280 SCFH
BTU Value	1,951 Btu/Scf
Total Heat input MAX	39.6 MMBTU/HR
Total BTU Load Max	41 MMBTU/hr
Combustion Chamber Temp: High Limit	1800 °F
Residence Time:	≥ 1.0 Sec.
Exit Velocity:	29.64 FT/sec.
Destruction Efficiency:	≥ 95%
Turn Down	10 : 1

Utility Flare Sizing:

Pipe Size:	6” Sch 40
Inlet Pressure:	8-12 osi
Volume	37,500 SCFH
BTU Value	1600 Btu/Scf
Total Heat input	60.0 MMBTU/HR
Exit Velocity:	125 FT/sec.
Destruction Efficiency:	≥ 95%
Δ P tip	.15 PSIG
Design Radiation	497 BTU/hr-sq.ft.

Site Conditions:

Wind Speed	90 MPH
Seismic Zone	1
Elevation	1000 ft.
Humidity	High

Utilities:

Gas Service Required for Pilot	100 SCFH – Natural Gas @ 20 PSIG Min. / 150 PSIG Max
Gas Service Required for Assist Fuel	8,000 SCFH – Natural Gas @ 20 PSIG Min. (Intermittent Usage)
Electrical Service Required	480 VAC, 3ph, 60Hz, 20 amp
Compressed Gas for Valves	80 PSIG – Intermittent

ATTACHMENT N

Supporting Emission Calculations

EQT Gathering - Janus Station
Facility-Wide Emissions Summary

	Janus Station													Janus Station TOTAL	
	CAT G3616 Compressor Engines	Capstone Microturbine	Fuel Gas Heaters		Dehydrator Enclosed Flares	Dehydration Units	Reboilers	Tank Enclosed Flare	Haul Roads	Miscellaneous Storage Tanks	Produced Fluids Storage Tanks	Liquid Loading Operations	Station Fugitives Blowdowns & Component Leaks		
Emission Unit ID	ENG-001 to ENG-004	EG-001 to EG-005	HTR-1	HTR-2	DEHY-001 to DEHY-002	DEHY-001 to DEHY-002	RB-001 to RB-002	FLARE-003	NA	T003 to T024	T-001 to T002	L1	NA		
Emission Point ID	ENG-001 to ENG-004	EG-001 to EG-005	HTR-1	HTR-2	FLARE-001 to FLARE-002	FLARE-001 to FLARE-002	RB-001 to RB-002	FLARE-003	NA	NA	FLARE-003	L1	NA		
Equipment Count	4	5	1	1	2	2	2	1	NA	22	2	NA	NA		
Equipment Status	Existing	Existing	Existing	Existing	Existing	Existing	Existing	Existing	Existing	Existing	Existing	Existing	Existing		
Fuel Type	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	---	Natural Gas	Natural Gas	NA	NA	NA	NA	NA		
Capacity	5,350	1.0	1.15	0.77	7	125	2.31	41		4,200 or less	210				
Unit	bhp	MW	MMBtu/hr	MMBtu/hr	MMBtu/hr	MMSCFD	MMBtu/hr	MMBtu/hr		gallon	bbl				
Hours per Year	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760		
Pollutant	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	lb/hr	tpy
PM_{10}	6.90	0.33	0.03	0.02	0.38	---	0.13	1.12	0.20	---	---	---	---	**2.08**	**9.11**
$PM_{2.5}$	6.90	0.33	0.03	0.02	0.38	---	0.13	1.12	0.01	---	---	---	---	**2.04**	**8.91**
SO_X	0.41	0.17	<0.01	<0.01	0.03	---	0.01	0.09	---	---	---	---	---	**0.16**	**0.71**
CO	35.73	4.82	0.35	0.23	4.25	---	1.39	12.34	---	---	---	---	---	**13.49**	**59.10**
NO_X	103.32	1.75	0.41	0.28	5.07	---	1.65	14.69	---	---	---	---	---	**29.03**	**127.16**
VOC (incl. HCHO)	68.91	0.44	0.02	0.02	---	13.60	0.09	---	---	0.00	8.37	0.09	30.80	**27.93**	**122.34**
CO_2	89,682	5,825	589	395	7,267	7,295	2,368	21073	---	---	--	---	0.47	**30706.42**	**134494.11**
CH_4	433.94	0.11	0.01	0.01	0.14	6.32	0.04	0.40	---	---	---	---	72.91	**117.33**	**513.88**
N_2O	0.15	0.01	<0.01	<0.01	0.01	---	0.00	0.04	---	---	---	---	---	**0.05**	**0.22**
CO_2e	100,576	5,831	590	395	7,274	7,453	2,370	21095	---	---	---	---	1,823	**33654.72**	**147407.68**
Formaldehyde	4.13	0.04	<0.01	<0.01	---	---	<0.01	---	---	---	---	---	---	**0.95**	**4.17**
Total HAPs (including HCHO)	14.66	0.05	0.01	0.01	---	5.92	0.03	---	---	---	0.20	---	1.69	**5.15**	**22.56**

1. VOC and HAP emissions are included in the storage tank emissions

Compressor Engines (Per Engine)

Source Designation:	
Manufacturer:	Caterpillar
Model No.:	3616
Stroke Cycle:	4-stroke
Type of Burn:	Lean Burn
Year Installed/Date Manufactured	TBD
Fuel Used:	Natural Gas
Fuel High Heating Value (HHV) (Btu/scf):	1,226
Rated Horsepower (bhp):	5,350
Specific Fuel Consumption (Btu/bhp-hr)	7,338
Maximum Fuel Consumption at 100% Load (scf/hr):	32,160
Heat Input (MMBtu/hr)	39.43
Control Device:	Oxidation Catalyst
Operational Details:	
Potential Annual Hours of Operation (hr/yr):	8,760
Potential Fuel Consumption (MMscf/yr):	281.7

Criteria and Manufacturer Specific Pollutant Emission Factors:

Pollutant	**Emission Factors[1]**	**Units**	**Estimation Basis / Emission Factor Source**
NOx	0.50	g/bhp-hr	CAT GERP Vendor Spec Sheet
CO	0.17	g/bhp-hr	Catalyst Vendor Spec Sheet
SO_2	5.88E-04	lb/MMBtu	AP-42, Table 3.2-2 (Jul-2000)
PM_{10} (Filterable)	7.71E-05	lb/MMBtu	AP-42, Table 3.2-2 (Jul-2000)
$PM_{2.5}$ (Filterable)	7.71E-05	lb/MMBtu	AP-42, Table 3.2-2 (Jul-2000)
PM Condensable	9.91E-03	lb/MMBtu	AP-42, Table 3.2-2 (Jul-2000)
PM Total	9.99E-03	lb/MMBtu	AP-42, Table 3.2-2 (Jul-2000)
NMNEHC	0.31	g/bhp-hr	Catalyst Vendor Spec Sheet
VOC (Includes HCHO)	0.33	g/bhp-hr	Catalyst Vendor Spec Sheet
Formaldehyde (HCHO)	0.02	g/bhp-hr	Catalyst Vendor Spec Sheet
CO_2	434.0	g/bhp-hr	CAT GERP Vendor Spec Sheet
CH_4	2.10	g/bhp-hr	Vendor Spec Sheet (=THC-NMHC)
N_2O	1.00E-04	kg/MMBtu	40 CFR 98, Table C-2

Criteria and Manufacturer Specific Pollutant Emission Rates:

Pollutant	**Potential Emissions**	
	(lb/hr)[2]	**(tons/yr)[3]**
NO_x	5.90	25.83
CO	2.04	8.93
SO_2	0.02	0.10
PM_{10} (Filterable)	0.003	0.01
$PM_{2.5}$ (Filterable)	0.003	0.01
PM Condensable	0.39	1.71
PM Total	0.39	1.73
NMNEHC	3.70	16.20
VOC (incl HCHO)	3.93	17.23
Formaldehyde (HCHO)	0.24	1.03
CO_2	5,119	22,420
CH_4	24.77	108.49
N_2O	0.01	0.04

Compressor Engines (Per Engine)

Hazardous Air Pollutant (HAP) Potential Emissions:

Pollutant	Emission Factor (lb/MMBtu)[1]	Potential Emissions (lb/hr)[2]	Potential Emissions (tons/yr)[3]
HAPs:			
Acenaphthene	1.25E-06	4.93E-05	2.16E-04
Acenaphthylene	5.53E-06	2.18E-04	9.55E-04
Acetaldehyde	8.36E-03	3.30E-01	1.44E+00
Acrolein	9.80E-04	3.87E-02	1.69E-01
Benzene	4.40E-04	1.74E-02	7.60E-02
Benzo(b)fluoranthene	1.66E-07	6.55E-06	2.87E-05
Benzo(e)pyrene	4.15E-07	1.64E-05	7.17E-05
Benzo(g,h,i)perlyene	4.14E-07	1.63E-05	7.15E-05
Biphenyl	2.12E-04	8.36E-03	3.66E-02
1,3-Butadiene	2.67E-04	1.05E-02	4.61E-02
Carbon Tetrachloride	3.67E-05	1.45E-03	6.34E-03
Chlorobenzene	3.04E-05	1.20E-03	5.25E-03
Chloroform	2.85E-05	1.12E-03	4.92E-03
Chrysene	6.93E-07	2.73E-05	1.20E-04
1,3-Dichloropropene	2.64E-05	1.04E-03	4.56E-03
Ethylbenzene	3.97E-05	1.57E-03	6.86E-03
Ethylene Dibromide	4.43E-05	1.75E-03	7.65E-03
Fluoranthene	1.11E-06	4.38E-05	1.92E-04
Fluorene	5.67E-06	2.24E-04	9.79E-04
Methanol	2.50E-03	9.86E-02	4.32E-01
Methylene Chloride	2.00E-05	7.89E-04	3.45E-03
n-Hexane	1.11E-03	4.38E-02	1.92E-01
Phenanthrene	1.04E-05	4.10E-04	1.80E-03
Phenol	2.40E-05	9.46E-04	4.15E-03
Pyrene	1.36E-06	5.36E-05	2.35E-04
Styrene	2.36E-05	9.31E-04	4.08E-03
Toluene	4.08E-04	1.61E-02	7.05E-02
1,1,2,2-Tetrachloroethane	4.00E-05	1.58E-03	6.91E-03
Tetrachloroethane	2.48E-06	9.78E-05	4.28E-04
1,1,2-Trichloroethane	3.18E-05	1.25E-03	5.49E-03
2,2,4-Trimethylpentane	2.50E-04	9.86E-03	4.32E-02
Vinyl Chloride	1.49E-05	5.88E-04	2.57E-03
Xylene	1.84E-04	7.26E-03	3.18E-02
Polycyclic Organic Matter:			
Naphthalene	7.44E-05	2.93E-03	1.29E-02
2-Methylnaphthalene	3.32E-05	1.31E-03	5.73E-03
PAH	2.69E-05	1.06E-03	4.65E-03
Total HAP		**0.84**	**3.66**

Notes:

1. SO_2, PM, and HAP emission factors from AP-42 Section 3.2, Table 3.2-2 "Uncontrolled Emission Factors for 4-Stroke Lean-Burn Engines," Supplement F, August 2000. Uncontrolled acrolein emission factor is based on SDAPCD emissions testing factors (assuming controlled values as tested are reduced by 99%) and assuming 1020 Btu/scf (http://www.sdapcd.org/content/dam/sdc/apcd/PDF/Misc/EFT/Gas_Combustion/APCD_Engine_Natural_Gas_Fired_4_Stroke_Lean_Burn_with_Catalytic_Oxidation.pdf). NO_X, VOC, CO, CO_2, and CH_4 (=THC-NMHC) and formaldehyde emission factors are based on manufacturer's data. Greenhouse gas emission factors (N_2O) are based on 40 CFR Part 98, Subpart C, Table C-2 for natural gas combustion.

2. Emission Rate (lb/hr) = Rated Capacity (MMBtu/hr or bhp) × Emission Factor (lb/MMBtu or gr/bhp-hr).

3. Annual Emissions $(tons/yr)_{Potential}$ = $(lb/hr)_{Emissions}$ × (Maximum Allowable Operating Hours, 8,760 hr/yr) × (1 ton/2000 lb).

Storage Tank Emissions

Tank Description	Tank Contents	Tank ID Number	Number of Tanks	Tank Capacity (gal)	Tank Diameter (ft)	Tank Length (ft)	Turnovers Per Year	Annual Throughput (gal)	VOC Emissions Per Tank (lb/yr)	Total VOC Emissions (tpy)	HAP Emissions Per Tank (lb/yr)	Total HAP Emissions (tpy)
Produced Fluids Tank	Produced Water	T-001	1	8,820	10	15.0	12	105,000	8,374.56	4.186	201.48	0.10
Produced Fluids Tank	Produced Water	T-002	1	8,820	10	15.0	12	105,000	8,374.56	4.186	201.48	0.10
Engine Lube Oil Tank	Engine Lube Oil	T-003	1	2,000	5.33	12.0	2	4,200	0.65	0.000	<0.01	<0.01
Compressor Lube Oil Tank	Compressor Oil	T-004	1	2,000	5.33	12.0	4	7,266	0.70	3.50E-04	<0.01	<0.01
New MEG Tank	New MEG	T-005	1	2,000	5.33	12.0	1	1,050	0.04	2.00E-05	<0.01	<0.01
Used MEG Tank	Used MEG	T-006	1	2,000	5.33	12.0	1	1,050	0.04	2.00E-05	<0.01	<0.01
Used Oil Tank	Used Oil	T-007	1	4,200	5.33	25.1	1	4,200	1.27	6.35E-04	<0.01	<0.01
Ice-chek Tank	Ice-chek	T-008	1	3,998	5.33	23.9	5	21,000	0.11	5.50E-05	<0.01	<0.01
Engine Lube Oil Tank	Engine Oil	T-009	1	302	3.2	5.1	3	1,050	0.11	5.50E-05	<0.01	<0.01
Engine Lube Oil Tank	Engine Oil	T-010	1	302	3.2	5.1	3	1,050	0.11	5.50E-05	<0.01	<0.01
Engine Lube Oil Tank	Engine Oil	T-011	1	302	3.2	5.1	3	1,050	0.11	5.50E-05	<0.01	<0.01
Engine Lube Oil Tank	Engine Oil	T-012	1	302	3.2	5.1	3	1,050	0.11	5.50E-05	<0.01	<0.01
Compressor Lube Oil Tank	Compressor Oil	T-013	1	302	3.2	5.1	6	1,806	0.11	5.50E-05	<0.01	<0.01
Compressor Lube Oil Tank	Compressor Oil	T-014	1	302	3.2	5.1	6	1,806	0.11	5.50E-05	<0.01	<0.01
Compressor Lube Oil Tank	Compressor Oil	T-015	1	302	3.2	5.1	6	1,806	0.11	5.50E-05	<0.01	<0.01
Compressor Lube Oil Tank	Compressor Oil	T-016	1	302	3.2	5.1	6	1,806	0.11	5.50E-05	<0.01	<0.01
Ice-chek Tank	Ice-chek	T-017	1	550	4.2	5.4	6	3,486	0.02	1.00E-05	<0.01	<0.01
Ice-chek Tank	Ice-chek	T-018	1	550	4.2	5.4	6	3,486	0.02	1.00E-05	<0.01	<0.01
Ice-chek Tank	Ice-chek	T-019	1	550	4.2	5.4	6	3,486	0.20	1.0E-04	<0.01	<0.01
Ice-chek Tank	Ice-chek	T-020	1	550	4.2	5.4	6	3,486	0.06	3.0E-05	<0.01	<0.01
Ice-chek Tank	Ice-chek	T-021	1	550	4.2	5.4	6	3,486	0.06	3.0E-05	<0.01	<0.01
Ice-chek Tank	Ice-chek	T-022	1	550	4.2	5.4	6	3,486	0.06	3.0E-05	<0.01	<0.01
New TEG Tank	New TEG	T-023	1	2,000	5.3	12.0	2	4,200	0.05	2.5E-05	<0.01	<0.01
Used TEG Tank	Used TEG	T-024	1	2,000	5.3	12.0	2	4,200	0.05	2.5E-05	<0.01	<0.01
Total Potential Emissions (excluding pipeline fluids tanks)									**4.21**	**0.00**	**0.000**	**0.00**

1. Ice-Chek contains ethylene glycol

Produced Fluids Tank (210 bbl) - T001 & T002

Operational Hours 8,760 hrs/yr

Control Efficiency 0% No credit is assumed for control using the combustor.

Annual Fluid Throughput (per tank) 105,000 gal/yr

Description	Potential Throughput [1] (gal/yr)
Produced Water	105,000

[1] Based on engineering estimate of produced water for the station. Produced water comprises of 90% water and 10% condensate

Storage Tank (210 bbl, each) - Emissions (Each Tank)

Constituent	Uncontrolled Total Emissions [1] lb/hr	Uncontrolled Total Emissions [1] tpy	Controlled Total Emissions [1] lb/hr	Controlled Total Emissions [1] tpy
Carbon Dioxide	0.002	0.007	0.002	0.007
Methane	0.158	0.692	0.158	0.692
Ethane	0.149	0.651	0.149	0.651
Propane	0.273	1.194	0.273	1.194
Isobutane	0.192	0.841	0.192	0.841
n-Butane	0.181	0.791	0.181	0.791
Isopentane	0.149	0.653	0.149	0.653
n-Pentane	0.063	0.276	0.063	0.276
n-Hexane	0.019	0.085	0.019	0.085
Other Hexanes	0.047	0.204	0.047	0.204
Heptanes	0.022	0.095	0.022	0.095
Benzene	0.001	0.005	0.001	0.005
Toluene	0.001	0.005	0.001	0.005
Ethylbenzene	<0.001	<0.001	<0.001	<0.001
Xylenes	0.000	0.002	0.000	0.002
2,2,4-Trimethylpentane	<0.001	<0.001	<0.001	<0.001
C8+ Heavies	0.008	0.036	0.008	0.036
Total Emissions:	1.262	5.529	1.262	5.529
Total VOC Emissions:	0.956	4.186	0.956	4.186
Total HAP Emissions:	0.023	0.100	0.023	0.100

[1] E&P TANK v2.0 calculates working, breathing and flashing losses and reports the sum as one total.

Fugitive Emissions

Fugitive Component Information:

Component Type	Estimated Component Count	Gas Leak Emission Factor		Average Gas Leak Rate	Max Gas Leak Rate	Potential VOC Emissions	Potential HAP Emissions
		(lb/hr/component)	Factor Source	(lb/hr)	(tpy)	(tpy)	(tpy)
Connectors	650	0.0004	EPA Protocol, Table 2-4	0.29	1.51	0.23	0.01
Flanges	250	0.001	EPA Protocol, Table 2-4	0.21	1.13	0.17	0.01
Open-Ended Lines	12	0.004	EPA Protocol, Table 2-4	0.05	0.28	0.04	0.00
Valves	700	0.010	EPA Protocol, Table 2-4	6.94	36.50	5.65	0.31
Total				**7.50**	**39.41**	**6.10**	**0.33**

Notes:

1. The component type "Other" includes any equipment type other than connectors, flanges, open-ended lines, pumps and valves that have fugitive emissions.
2. The component count is a preliminary estimate based on the proposed design of the station
3. *Table 2-4 :Oil & Gas Production Operations Average Emission Factors* , Protocol for Equipment Leak Emission Estimates, EPA 453/R-95-017, November 1995.
4. Assumes maximum leak rate 20% greater than measured average leak rate.

GHG Fugitive Emissions from Component Leaks:

Component Type	Estimated Component Count	GHG Emission Factor		CH_4 Emissions	CO_2 Emissions	CO_2e Emissions
		(scf/hr/component)	Factor Source	(tpy)	(tpy)	(tpy)
Connectors	650	0.003	40 CFR 98, Table W-1A	0.29	1.9E-03	7.29
Flanges	250	0.003	40 CFR 98, Table W-1A	0.11	7.2E-04	2.80
Open-Ended Lines	12	0.061	40 CFR 98, Table W-1A	0.11	7.1E-04	2.74
Valves	700	0.027	40 CFR 98, Table W-1A	2.83	1.8E-02	70.66
Total				**3.34**	**0.02**	**83.49**

Notes:

1. The component count is a preliminary estimate based on the proposed design of the station
2. *Table W-1 of Subpart W - Default Whole Gas Emission Factors for Onshore Production* , 40 CFR 98, Subpart W.
3. Calculated in accordance with Equations W-32a, W-35, and W-36 in Subpart W of 40 CFR 98.
4. GHG (CO_2e) is carbon dioxide equivalent, which is the summation of CO2 (GWP = 1) + CH4 (GWP = 25) + N2O (GWP = 298).

Rod Packing Emissions

Number of Compressors	Number of Rods Per Compressor	Leak Rate (scf/hr/rod)	Total Volume NG Emitted (scf/yr)	Potential VOC Emissions (tpy)	Potential HAP Emissions (tpy)	Potential CO_2 Emissions (tpy)	Potential CH_4 Emissions (tpy)	Potential CO_2e Emissions (tpy)
4	6	11	2,312,640	8.94	0.49	0.25	39.47	987.03
Total				**8.94**	**0.49**	**0.25**	**39.47**	**987.03**

Notes:

1. Assumes a density of natural gas of 0.05 lb/scf
2. Leak rate from https://www3.epa.gov/gasstar/documents/ll_rodpack.pdf

VOC/GHG Fugitive Emissions from Blowdowns:

Blowdown Type	Number of Events	Gas Volume	VOC Emissions	HAP Emissions	CH_4 Emissions	CO_2 Emissions	CO_2e Emissions
		(scf/event)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)
Station ESD	5	358,000	6.92	0.38	30.55	0.20	763.97
Pigging Operations	250	2,000	1.93	0.11	8.53	0.06	213.40
Filter Maintenance	15	13,500	0.78	0.04	3.46	0.02	86.43
Compressor	36	44,000	6.13	0.34	27.03	0.17	676.05
Total			**15.76**	**0.86**	**69.58**	**0.45**	**1,739.84**

Notes:

1. CH_4 and CO_2 emissions are based on fractions of these pollutants in the site-specific gas analysis.
2. GHG Emissions are calculated in accordance with Equations W-35 and W-36 in Subpart W of 40 CFR 98.
3. GHG (CO_2e) is carbon dioxide equivalent, which is the summation of CO_2 (GWP = 1) + CH_4 (GWP = 25) + N_2O (GWP = 298).
4. Density of natural gas: 0.05 lb/ft3 @ STP and wt% are used for VOC and HAP emission calculations.

Fugitive Component Emissions Data:

Pollutant	Atmospheric Emissions		Emissions Estimation Method
	lbs/hr	tpy	
VOC	7.03	30.80	EPA Protocol, Table 2-4 and Site-Specific Gas Analysis
HAPs	0.39	1.69	EPA Protocol, Table 2-4 and Site-Specific Gas Analysis
GHG (CO_2e)	642	2810	40 CFR 98, Table W-1A and Site-Specific Gas Analysis

E17 - ENGINES, NATURAL GAS FIRED, 4 STROKE, LEAN BURN, WITH CATALYTIC OXIDATION

CALCULATION METHODS

Ea = Ua x EF (lbs/mmft3)

Eh = Uh (scfm) x (60/1000000) x EF (lbs/mmft3)

NOTES:

- Catalytic oxidation can achieve efficiencies of approximately 90% in reducing of CO, ROG, TOG, and AB2588 toxic organic compounds.

- The trace organic factors listed below are based on detected AB 2588 compounds listed in AP-42 Table 3.2-2 (7/00).

- The AP-42 (7/00) emission factors have been converted into lbs/mmscf by assuming a natural gas BTU content of 1020 BTU/scf.

- PM10 and TSP emission factors include filterable and condensable PM in accordance with the District's definition of particulate matter.

- The listed AP-42 emission factors for 1,1,2-trichloroethane, 1,1-dichloroethane, 1,2-dichloroethane, 1,2-dichloropropane, 1,3-dichloropropene, carbon tetrachloride, chloroform, ethylene dibromide, styrene, and vinyl chloride are NOT included since these values are based on nondetectable test results.

- The listed AP-42 emission factors for 1,1,2,2-tetrachloroethane, 1,2,4-trimethylbenzene, 2,2,4-trimethylpentane, 2-methylnaphthalene, acenaphthalene, acenaphthylene, anthracene, benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, biphenyl, chlorobenzene, chrysene, cyclohexane, fluoranthene, fluorene, indeno(1,2,3-c,d)pyrene, perylene, phenanthrene, and pyrene are NOT included since these values were based on insignificant and/or nondetectable test results.

- Trace metal emission factors were not reported in AP-42 and are NOT included since natural gas fired engines are not expected to emit metals.

- The AP-42 emission factors for 1,2,3-trimethylbenzene, 1,3,5-trimethylpentane, butane, butyr/isobutyraldehyde, cyclopentane, ethane, isobutane, methylcyclohexane, n-nonane, n-octane, n-pentane, and propane are not included since these are not listed toxic air contaminants.

- The AP-42 acrolein emission factor is NOT included since this value is based on test data and detection limits from incorrect sampling methods. A District factor based on local test results and adjusted for equipment VOC controls is considered more accurate than the AP-42 value.

Pollutant	District Emission Factor (lbs/million ft3 fuel burned)	EPA Reference Document	EPA Factor	Units	Comments
NOx	4161.60	AP-42, Sect 3.2, 7/00, Table 3.2-2	4.08E+00	lbs/MMBTU	
CO	32.33	AP-42, Sect 3.2, 7/00, Table 3.2-2	3.17E-01	lbs/MMBTU	Catalytic oxidation 90% control of value shown in Table 3.2-2
SOx	0.60	AP-42, Sect 3.2, 7/00, Table 3.2-2	5.88E-04	lbs/MMBTU	Assume a sulfur content of 0.05% and a fuel density of 7 lbs/gal
TOG	149.94	AP-42, Sect 3.2, 7/00, Table 3.2-2	1.47E+00	lbs/MMBTU	Catalytic oxidation 90% control of value shown in Table 3.2-2
ROG	12.04	AP-42, Sect 3.2, 7/00, Table 3.2-2	1.18E-01	lbs/MMBTU	Catalytic oxidation 90% control of value shown in Table 3.2-2
TSP	10.19	AP-42, Sect 3.2, 7/00, Table 3.2-2	9.99E-03	lbs/MMBTU	TSP includes filterable (7.71 E-05) and condensable (9.91 E-03) PM.
PM10	10.19	AP-42, Sect 3.2, 7/00, Table 3.2-2	9.99E-03	lbs/MMBTU	PM10 includes filterable (7.71 E-05) and condensable (9.91 E-03) PM.
1,3-Butadiene	0.03	AP-42, Sect 3.2, 7/00, Table 3.2-2	2.67E-04	lbs/MMBTU	Catalytic oxidation 90% control of value shown in Table 3.2-2
Acetaldehyde	0.85	AP-42, Sect 3.2, 7/00, Table 3.2-2	8.36E-03	lbs/MMBTU	Catalytic oxidation 90% control of value shown in Table 3.2-2
Acrolein	0.01	AP-42, Sect 3.2, 7/00, Table 3.2-2	5.14E-03	lbs/MMBTU	District emission factor based on SDAPCD source test results.

Benzene	0.04	AP-42, Sect 3.2, 7/00, Table 3.2-2	4.40E-04	lbs/MMBTU	Catalytic oxidation 90% control of value shown in Table 3.2-2
Ethylbenzene	0.004	AP-42, Sect 3.2, 7/00, Table 3.2-2	3.97E-05	lbs/MMBTU	Catalytic oxidation 90% control of value shown in Table 3.2-2
Formaldehyde	5.39	AP-42, Sect 3.2, 7/00, Table 3.2-2	5.28E-02	lbs/MMBTU	Catalytic oxidation 90% control of value shown in Table 3.2-2
Hexane	0.11	AP-42, Sect 3.2, 7/00, Table 3.2-2	1.11E-03	lbs/MMBTU	Catalytic oxidation 90% control of value shown in Table 3.2-2
Methanol	0.26	AP-42, Sect 3.2, 7/00, Table 3.2-2	2.50E-03	lbs/MMBTU	Catalytic oxidation 90% control of value shown in Table 3.2-2
Methylene Chloride	0.002	AP-42, Sect 3.2, 7/00, Table 3.2-2	2.00E-05	lbs/MMBTU	Catalytic oxidation 90% control of value shown in Table 3.2-2
Naphthalene	0.01	AP-42, Sect 3.2, 7/00, Table 3.2-2	7.44E-05	lbs/MMBTU	Catalytic oxidation 90% control of value shown in Table 3.2-2
PAH	0.003	AP-42, Sect 3.2, 7/00, Table 3.2-2	2.69E-05	lbs/MMBTU	Catalytic oxidation 90% control of value shown in Table 3.2-2
Phenol	0.002	AP-42, Sect 3.2, 7/00, Table 3.2-2	2.40E-05	lbs/MMBTU	Catalytic oxidation 90% control of value shown in Table 3.2-2
Toluene	0.04	AP-42, Sect 3.2, 7/00, Table 3.2-2	4.08E-04	lbs/MMBTU	Catalytic oxidation 90% control of value shown in Table 3.2-2
Xylenes	0.02	AP-42, Sect 3.2, 7/00, Table 3.2-2	1.84E-04	lbs/MMBTU	Catalytic oxidation 90% control of value shown in Table 3.2-2

Last Updated on 7/20/01 (E06)
By D. Byrnes / A. Mar

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

Project File : Z:\Client\EQT Corporation\West Virginia\Janus\153901.0106 R13 Application\04 Draft\2015-0708 Janus R13 Application\Attach N - Emission Calculations\E&P Tank\20150715_EQT_Janus_PWT.ept
Flowsheet Selection : Oil Tank with Separator
Calculation Method : RVP Distillation
Control Efficiency : 95.0%
Known Separator Stream : Geographical Region
Geographical Region : All Regions in US
Entering Air Composition : No

Filed Name : Janus Produced Water Tank
Well Name : 210 bbl PWT
Date : 2015.07.15

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

Separator Pressure : 300.00[psig]
Separator Temperature : 80.00[F]
Ambient Pressure : 14.70[psia]
Ambient Temperature : 80.00[F]
C10+ SG : 0.8820
C10+ MW : 296.00

-- Low Pressure Oil ----------

No.	Component	mol %
1	H2S	0.0000
2	O2	0.0000
3	CO2	0.0300
4	N2	0.0900
5	C1	8.4300
6	C2	4.2300
7	C3	5.9100
8	i-C4	5.1700
9	n-C4	6.2200
10	i-C5	8.9100
11	n-C5	4.9700
12	C6	9.1100
13	C7	11.3400
14	C8	10.3900
15	C9	5.9600
16	C10+	11.7500
17	Benzene	0.3700
18	Toluene	0.9800
19	E-Benzene	0.1500
20	Xylenes	1.1900
21	n-C6	4.8000
22	224Trimethylp	0.0000

-- Sales Oil ----------
Production Rate : 1[bbl/day]
Days of Annual Operation : 365 [days/year]
API Gravity : 58.0
Reid Vapor Pressure : 10.60[psia]

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

-- Emission Summary ----------

Item	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]	Controlled [ton/yr]	Controlled [lb/hr]
Page 1---------- E&P TANK				
Total HAPs	0.100	0.023	0.005	0.001
Total HC	5.529	1.262	0.276	0.063
VOCs, C2+	4.836	1.104	0.242	0.055
VOCs, C3+	4.186	0.956	0.209	0.048

Uncontrolled Recovery Info.
Vapor 287.1100 x1E-3 [MSCFD]
HC Vapor 285.8300 x1E-3 [MSCFD]
GOR 287.11 [SCF/bbl]

-- Emission Composition ----------

No	Component	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]	Controlled [ton/yr]	Controlled [lb/hr]
1	H2S	0.000	0.000	0.000	0.000
2	O2	0.000	0.000	0.000	0.000
3	CO2	0.007	0.002	0.007	0.002
4	N2	0.013	0.003	0.013	0.003
5	C1	0.692	0.158	0.035	0.008
6	C2	0.651	0.149	0.033	0.007
7	C3	1.194	0.273	0.060	0.014
8	i-C4	0.841	0.192	0.042	0.010
9	n-C4	0.791	0.181	0.040	0.009
10	i-C5	0.653	0.149	0.033	0.007
11	n-C5	0.276	0.063	0.014	0.003
12	C6	0.204	0.047	0.010	0.002
13	C7	0.095	0.022	0.005	0.001
14	C8	0.030	0.007	0.002	0.000
15	C9	0.006	0.001	0.000	0.000
16	C10+	0.000	0.000	0.000	0.000
17	Benzene	0.005	0.001	0.000	0.000
18	Toluene	0.005	0.001	0.000	0.000
19	E-Benzene	0.000	0.000	0.000	0.000
20	Xylenes	0.002	0.000	0.000	0.000
21	n-C6	0.085	0.019	0.004	0.001
22	224Trimethylp	0.000	0.000	0.000	0.000
	Total	5.550	1.267	0.277	0.063

-- 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	0.0300	0.0021	0.0000	0.1194	0.0496	0.1111
4	N2	28.01	0.0900	0.0006	0.0000	0.3763	0.0145	0.3332
5	C1	16.04	8.4300	0.2054	0.0000	34.7691	4.8646	31.2062
6	C2	30.07	4.2300	0.5879	0.0039	15.8939	13.8313	15.6481
7	C3	44.10	5.9100	2.4063	0.8494	17.1306	37.7108	19.5826
8	i-C4	58.12	5.1700	3.7204	3.2119	9.8124	15.2521	10.4605
9	n-C4	58.12	6.2200	5.2238	4.8805	9.4102	13.0089	9.8389
10	i-C5	72.15	8.9100	9.7007	9.7854	6.3777	7.7795	6.5447
11	n-C5	72.15	4.9700	5.6802	5.7866	2.6955	3.2686	2.7638
12	C6	86.16	9.1100	11.4207	11.8324	1.7100	2.0852	1.7547
13	C7	100.20	11.3400	14.6665	15.2753	0.6869	0.8605	0.7075
14	C8	114.23	10.3900	13.5756	14.1635	0.1882	0.2442	0.1949
15	C9	128.28	5.9600	7.8101	8.1523	0.0352	0.0503	0.0370
16	C10+	175.93	11.7500	15.4190	16.0990	0.0000	0.0000	0.0000
17	Benzene	78.11	0.3700	0.4701	0.4881	0.0496	0.0610	0.0509
18	Toluene	92.13	0.9800	1.2750	1.3293	0.0351	0.0448	0.0363
19	E-Benzene	106.17	0.1500	0.1963	0.2049	0.0017	0.0022	0.0017
20	Xylenes	106.17	1.1900	1.5580	1.6260	0.0114	0.0152	0.0119
21	n-C6	86.18	4.8000	6.0812	6.3116	0.6969	0.8566	0.7160
22	224Trimethylp	114.24	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	MW		100.95	120.35	123.46	38.83	49.76	40.13
	Stream Mole Ratio		1.0000	0.7620	0.7299	0.2380	0.0322	0.2701
	Heating Value	[BTU/SCF]			2218.43	2811.04	2289.04	
	Gas Gravity	[Gas/Air]			1.34	1.72	1.39	
	Bubble Pt. @ 100F	[psia]	322.24	24.57	11.47			

RVP @ 100F	[psia]	79.39	15.92	10.57
Spec. Gravity @ 100F		0.672	0.695	0.698

ATTACHMENT O

Monitoring/Recordkeeping/Reporting/Testing Plans

ATTACHMENT O - MONITORING, RECORDING, REPORTING, AND TESTING PLANS

Plan Type	Emission unit	Pollutant	Requirements	Frequency	Method of Measurement	Regulatory Reference
Monitoring, Recordkeeping	Storage Tanks	VOC	Monitor throughput of Tanks		N/A	(Condition 4.1.8.b of Permit)
Monitoring	Blowdowns, Station Fugitives, Pigging	VOC	Monitor station blowdown, shutdown, pigging venting events	Annual	12 Month Rolling Total	(Condition 4.1.12.c of Permit)
Monitoring, Recordkeeping	Liquid Loading	VOC	Monitor throughput of loading		Records	(Condition 4.1.9.b of Permit)

See Attachment D for additional information.

ATTACHMENT P

Public Notice

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that EGT Gathering, LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Class II Administrative Update to permit number R13-3269 for an existing natural gas compressor station (the Janus Station) located off Left Fork Run Road in Doddridge County, West Virginia. The site latitude and longitude coordinates are: 39.25777 N, -80.80566 W.

The applicant estimates the potential increase in the following Regulated Air Pollutants associated with the project will be:

Particulate Matter (PM) = <0.01 tpy
Sulfur Dioxide (SO2) = <0.01 tpy
Volatile Organic Compounds (VOC) = 7.95 tpy
Carbon Monoxide (CO) = <0.01 tpy
Nitrogen Oxides (NOx) = <0.01 tpy
Hazardous Air Pollutants (HAPs) = <0.01 tpy
Carbon Dioxide Equivalents (CO_2e) = 988.85 tpy

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 on June 9, 2016.

By: EQT Gathering, LLC
Diana Charletta, Senior Vice President – Midstream Operations
625 Liberty Avenue Suite 1700
Pittsburgh, PA 15222