Tipane, Frederick <frederick.tipane@wv.gov>

Re: [EXTERNAL] EQM Gathering OPCO, LLC's Janus Compressor Station Title V Pre-Draft/Proposed Renewal Permit R30-01700158-2024

1 message

Tipane, Frederick <frederick.tipane@wv.gov> Thu, Oct 24, 2024 at 11:43 AM
To: "Knibloe, James" <james.knibloe@eqt.com>

Thanks Jim.

On Thu, Oct 24, 2024 at 11:03 AM Knibloe, James <james.knibloe@eqt.com> wrote:

> We have no comments.
>
> Thanks
>
> **Jim Knibloe, P.E.**
>
> Environmental Engineer
>
> EQT Corporation
>
> (412) 525-0609 Cell
>
> ---
>
> **From:** Tipane, Frederick <frederick.tipane@wv.gov>
> **Sent:** Tuesday, October 15, 2024 4:49 PM
> **To:** Knibloe, James <james.knibloe@eqt.com>
> **Subject:** [EXTERNAL] EQM Gathering OPCO, LLC's Janus Compressor Station Title V Pre-Draft/Proposed Renewal Permit R30-01700158-2024
>
> Jim,
>
> Attached for your review is the Pre-Draft/Proposed permit and factsheet for the Janus Compressor Station. Please forward any questions, comments or concerns you have with these documents as soon as possible but no later than Friday October 25, 2024.
>
> Feel free to contact me if you have any questions or wish to discuss any issues.
>
> Regards,

Fred

--

Frederick Tipane

Division of Air Quality

601 57th Street, SE

Charleston, WV 25304
(304) 414-1910

frederick.tipane@wv.gov

To learn about EQT's environmental, social and governance efforts visit: https://esg.eqt.com

Tipane, Frederick <frederick.tipane@wv.gov>

EQM Gathering OPCO, LLC's Janus Compressor Station Title V Pre-Draft/Proposed Renewal Permit R30-01700158-2024

1 message

Tipane, Frederick <frederick.tipane@wv.gov> Tue, Oct 15, 2024 at 4:49 PM
To: "Knibloe, James" <james.knibloe@eqt.com>

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Regards,
Fred

--

Frederick Tipane

Division of Air Quality

601 57th Street, SE

Charleston, WV 25304
(304) 414-1910
frederick.tipane@wv.gov

2 attachments

Pre-DPPermit R30-01700158-2024_R1.docx
418K

Pre-DPFactSheet R30-01700158-2024_R1.docx
206K

Tipane, Frederick <frederick.tipane@wv.gov>

Re: [EXTERNAL] Request for additional CAM Plan: Janus Compressor Station Title V CAM Plan Renewal Permit R30-01700158-2024

1 message

Tipane, Frederick <frederick.tipane@wv.gov> Tue, Oct 8, 2024 at 12:47 PM
To: "Knibloe, James" <james.knibloe@eqt.com>

Will do. Thanks.

On Tue, Oct 8, 2024 at 12:46 PM Knibloe, James <james.knibloe@eqt.com> wrote:

> Yes, please adjust the flare combustion zone indicator range to 1,400°F-1,800°F.
>
> Thanks
>
> Jim
>
> ---
>
> **From:** Tipane, Frederick <frederick.tipane@wv.gov>
> **Sent:** Tuesday, October 8, 2024 11:07 AM
> **To:** Knibloe, James <james.knibloe@eqt.com>
> **Subject:** Re: [EXTERNAL] Request for additional CAM Plan: Janus Compressor Station Title V CAM Plan Renewal Permit R30-01700158-2024
>
> Jim,
>
> Thanks for the information and CAM Plan for the Engines.
>
> For the DEHY-001 and DEHY-002 CAM Plan, since there is documentation from the flare vendor regarding the 98% destruction efficiency at 1400°F, do you want me to revise the flare combustion zone indicator range to 1400°F -1800°F instead of the 1450°F - 1800°F as we discussed in our phone conversation?
>
> Thanks ,
>
> Fred
>
> On Tue, Oct 8, 2024 at 10:38 AM Knibloe, James <james.knibloe@eqt.com> wrote:
>
> > Fred,
> >
> > Please find attached the requested CAM plan for the compressor engines.

The RO change was submitted for Janus as well as for all of our other permitted facilities last week. The Janus email is attached for your reference.

Regarding our discussion of the minimum temperature required for the 98% destruction efficiency of the flare, I have attached a vendor guarantee statement that this is accomplished at a minimum temperature of 1,400°F. The units will supply the required volume of assist gas to maintain 1,450°F, which is why that is stated in the vendor documentation. Automation will shut down the glycol pumps if the flare temperature goes below 1,400°F.

Thanks

Jim

From: Tipane, Frederick <frederick.tipane@wv.gov>
Sent: Tuesday, October 1, 2024 10:48 AM
To: Knibloe, James <james.knibloe@eqt.com>
Subject: [EXTERNAL] Request for additional CAM Plan: Janus Compressor Station Title V CAM Plan Renewal Permit R30-01700158-2024

Jim,

The purpose of my telephone call to you Yesterday was to give you a heads up regarding a request for an additional CAM Plan. During the processing of the renewal permit, I became aware of the need for a CAM plan for the compressor engines regarding carbon monoxide (CO) and formaldehyde (HCHO). Hence, I am requesting the submission of a CAM Plan for the Compressor Engines ENG-001, ENG-002, ENG-003 and ENG-004 for CO and HCHO. The limits for these pollutants are applicable through permit R13-3269B. Although 40 CFR 60 Subpart JJJJ is applicable to the engines, the R13-3269B limit for CO is more stringent than the Subpart JJJJ limits and Subpart JJJJ does not contain limits for HCHO. Therefore the engines cannot be exempt from CAM under 40 CFR §64.2(b)(1)(i).

Please submit the CAM plan as soon as possible but no later than Thursday October 10, 2024.

I also wanted to discuss the responsible official (RO) for the Janus Compressor Station. I noticed on the 2024 Semi-Annual Report submitted on September 11, 2024, the RO that signed the report was Michael Laudebaugh. I was unable to confirm that the paperwork was submitted to the WVDAQ designating him as the RO. Please find attached a form that will need to be filled out and submitted to the DAQ designating Mr Lauderbaugh as the RO.

As we discussed, I will give you a call Wednesday morning when you return to work or if you prefer you can give me a call at 304-414-1910.

Regards,

Fred

–

Frederick Tipane

Division of Air Quality

601 57th Street, SE

Charleston, WV 25304
(304) 414-1910

frederick.tipane@wv.gov

To learn about EQT's environmental, social and governance efforts visit: https://esg.eqt.com

Tipane, Frederick <frederick.tipane@wv.gov>

RE: [EXTERNAL] Request for additional CAM Plan: Janus Compressor Station Title V CAM Plan Renewal Permit R30-01700158-2024

1 message

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To: Knibloe, James <james.knibloe@eqt.com>
Subject: [EXTERNAL] Request for additional CAM Plan: Janus Compressor Station Title V CAM Plan Renewal Permit R30-01700158-2024

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Fred

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Division of Air Quality

601 57th Street, SE

Charleston, WV 25304
(304) 414-1910

frederick.tipane@wv.gov

To learn about EQT's environmental, social and governance efforts visit: https://esg.eqt.com

---------- Forwarded message ---------
From: "Knibloe, James" <james.knibloe@eqt.com>
To: "DEPAirQualityPermitting@wv.gov" <DEPAirQualityPermitting@wv.gov>
Cc: "Henry, Regina" <RHenry@eqt.com>
Bcc:
Date: Thu, 3 Oct 2024 19:37:21 +0000
Subject: Janus Compressor Station

Please find attached the RO change form for the Janus Compressor Station.

Sincerely,

Jim Knibloe, P.E.

Environmental Engineer

EQT Corporation

(412) 525-0609 Cell

4 attachments

H - CAM Plan Janus Comp Eng 100824.pdf
106K

Flare Services DVC Emissions Statement 2024.pdf
105K

Janus_Title_V_Permit_RO_Change_Signed.pdf
1275K

Janus Compressor Station.eml
1749K

ATTACHMENT H - Compliance Assurance Monitoring (CAM) Plan Form

For definitions and information about the CAM rule, please refer to 40 CFR Part 64. Additional information (including guidance documents) may also be found at http://www.epa.gov/ttn/emc/cam.html

CAM APPLICABILITY DETERMINATION

1) Does the facility have a PSEU (Pollutant-Specific Emissions Unit considered separately with respect to **EACH** regulated air pollutant) that is subject to CAM (40 CFR Part 64), which must be addressed in this CAM plan submittal? To determine applicability, a PSEU must meet **all** of the following criteria (*If No, then the remainder of this form need not be completed*): ☑ YES ☐ NO

a. The PSEU is located at a major source that is required to obtain a Title V permit;

b. The PSEU is subject to an emission limitation or standard for the applicable regulated air pollutant that is NOT exempt;

LIST OF EXEMPT EMISSION LIMITATIONS OR STANDARDS:

- NSPS (40 CFR Part 60) or NESHAP (40 CFR Parts 61 and 63) proposed after 11/15/1990.
- Stratospheric Ozone Protection Requirements.
- Acid Rain Program Requirements.
- Emission Limitations or Standards for which a WVDEP Division of Air Quality Title V permit specifies a continuous compliance determination method, as defined in 40 CFR §64.1.
- An emission cap that meets the requirements specified in 40 CFR §70.4(b)(12).

c. The PSEU uses an add-on control device (as defined in 40 CFR §64.1) to achieve compliance with an emission limitation or standard;

d. The PSEU has potential pre-control device emissions of the applicable regulated air pollutant that are equal to or greater than the Title V Major Source Threshold Levels; AND

e. The PSEU is NOT an exempt backup utility power emissions unit that is municipally-owned.

BASIS OF CAM SUBMITTAL

2) Mark the appropriate box below as to why this CAM plan is being submitted as part of an application for a Title V permit:

☑ RENEWAL APPLICATION. **ALL** PSEUs for which a CAM plan has NOT yet been approved need to be addressed in this CAM plan submittal.

☐ INITIAL APPLICATION (submitted after 4/20/98). **ONLY** large PSEUs (i. e., PSEUs with potential post-control device emissions of an applicable regulated air pollutant that are equal to or greater than Major Source Threshold Levels) need to be addressed in this CAM plan submittal.

☐ SIGNIFICANT MODIFICATION TO LARGE PSEUs. **ONLY** large PSEUs being modified after 4/20/98 need to be addressed in this cam plan submittal. For large PSEUs with an approved CAM plan, Only address the appropriate monitoring requirements affected by the significant modification.

3) [a] BACKGROUND DATA AND INFORMATION					
Complete the following table for **all** PSEUs that need to be addressed in this CAM plan submittal. This section is to be used to provide background data and information for each PSEU In order to supplement the submittal requirements specified in 40 CFR §64.4. If additional space is needed, attach and label accordingly.					
PSEU DESIGNATION	DESCRIPTION	POLLUTANT	CONTROL DEVICE	[b] EMISSION LIMITATION or STANDARD	[c] MONITORING REQUIREMENT
ENG-001 through ENG-004	Caterpillar G3616 4SLB Engine	CO	C1 through C4	R13-3269B, 4.1.1.a.i, 2.0 g/hp-hr	Stack testing every 8,760 hours of operation or 3 years, whichever comes first.
ENG-001 through ENG-004	Caterpillar G3616 4SLB Engine	HCHO	C1 through C4	R13-3269B, 4.1.1.a.v, 0.24 lbs/hr	Stack testing every 8,760 hours of operation or 3 years, whichever comes first.
EXAMPLE Boiler No. 1	Wood-Fired Boiler	PM	Multiclone	45CSR§2-4.1.c.; 9.0 lb/hr	Monitor pressure drop across multiclone: Weekly inspection of multiclone

[a] If a control device is common to more than one PSEU, one monitoring plan may be submitted for the control device with the affected PSEUs identified and any conditions that must be maintained or monitored in accordance with 40 CFR §64.3(a). If a single PSEU is controlled by more than one control device similar in design and operation, one monitoring plan for the applicable control devices may be submitted with the applicable control devices identified and any conditions that must be maintained or monitored in accordance with 40 CFR §64.3(a).

[b] Indicate the emission limitation or standard for any applicable requirement that constitutes an emission limitation, emission standard, or standard of performance (as defined in 40 CFR §64.1).

[c] Indicate the monitoring requirements for the PSEU that are required by an applicable regulation or permit condition.

CAM MONITORING APPROACH CRITERIA

Complete this section for **EACH** PSEU that needs to be addressed in this CAM plan submittal. This section may be copied as needed for each PSEU. This section is to be used to provide monitoring data and information for EACH indicator selected for EACH PSEU in order to meet the monitoring design criteria specified in 40 CFR §64.3 and §64.4. if more than two indicators are being selected for a PSEU or if additional space is needed, attach and label accordingly with the appropriate PSEU designation, pollutant, and indicator numbers.

4a) PSEU Designation:	**4b) Pollutant:**	**4c) [a] Indicator No. 1:**	**4d) [a] Indicator No. 2:**
ENG-001 through ENG-004	CO and HCHO	Stack test results	Pre Catalyst Exhaust Temperature
5a) GENERAL CRITERIA Describe the MONITORING APPROACH used to measure the indicators:		Stack testing is performed at the interval required by the permit.	Pre catalyst temperatures are continuously monitored.
[b] Establish the appropriate INDICATOR RANGE or the procedures for establishing the indicator range which provides a reasonable assurance of compliance:		CO emissions <2.0 g/bhp-hr, HCHO emissions <0.24 lbs/hr.	Pre catalyst temperature not to exceed 1350°F. The units will shut down if the pre catalyst temperature exceeds 1200°F.
5b) PERFORMANCE CRITERIA Provide the SPECIFICATIONS FOR OBTAINING REPRESENTATIVE DATA, such as detector location, installation specifications, and minimum acceptable accuracy:		As outlined in the stack test protocol submitted.	The thermocouple is installed upstream of the catalyst elements. The thermocouple has an accuracy of +/- 4.0°F.
[c] For new or modified monitoring equipment, provide VERIFICATION PROCEDURES, including manufacturer's recommendations, TO CONFIRM THE OPERATIONAL STATUS of the monitoring:		N/A	N/A
Provide QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC) PRACTICES that are adequate to ensure the continuing validity of the data, (i.e., daily calibrations, visual inspections, routine maintenance, RATA, etc.):		As outlined in the stack test protocol submitted.	For the thermocouple; calibration, maintenance, and operation shall be conducted in accordance with the manufacturer's specifications.
[d] Provide the MONITORING FREQUENCY:		Every 8,760 hours of operation or 3 years, whichever comes first.	The thermocouple temperature is monitored continuously.
Provide the DATA COLLECTION PROCEDURES that will be used:		Readings from the stack tests are reflected in the stack test reports.	Readings from the thermocouple are stored in EQT servers for a minimum of 5 years.
Provide the DATA AVERAGING PERIOD for the purpose of determining whether an excursion or exceedance has occurred:		N/A	The temperature is monitored continuously to determine if the unit is out of compliance. No data averaging will be used.

[a] Describe all indicators to be monitored which satisfies 40 CFR §64.3(a). Indicators of emission control performance for the control device and associated capture system may include measured or predicted emissions (including visible emissions or opacity), process and control device operating parameters that affect control device (and capture system) efficiency or emission rates, or recorded findings of inspection and maintenance activities.

[b] Indicator Ranges may be based on a single maximum or minimum value or at multiple levels that are relevant to distinctly different operating conditions, expressed as a function of process variables, expressed as maintaining the applicable indicator in a particular operational status or designated condition, or established as interdependent between more than one indicator. For CEMS, COMS, or PEMS, include the most recent certification test for the monitor.

[c] The verification for operational status should include procedures for installation, calibration, and operation of the monitoring equipment, conducted in accordance with the manufacturer's recommendations, necessary to confirm the monitoring equipment is operational prior to the commencement of the required monitoring.

[d] Emission units with post-control PTE ≥ 100 percent of the amount classifying the source as a major source (i.e., Large PSEU) must collect four or more values per hour to be averaged. A reduced data collection frequency may be approved in limited circumstances. Other emission units must collect data at least once per 24 hour period.

RATIONALE AND JUSTIFICATION

Complete this section for **EACH** PSEU that needs to be addressed in this CAM plan submittal. This section may be copied as needed for each PSEU. This section is to be used to provide rationale and justification for the selection of EACH indicator and monitoring approach and EACH indicator range in order to meet the submittal requirements specified in 40 CFR §64.4.

6a) PSEU Designation:	6b) Regulated Air Pollutant:
ENG-001 through ENG-004	CO and HCHO

7) **INDICATORS AND THE MONITORING APPROACH**: Provide the rationale and justification for the selection of the indicators and the monitoring approach used to measure the indicators. Also provide any data supporting the rationale and justification. Explain the reasons for any differences between the verification of operational status or the quality assurance and control practices proposed, and the manufacturer's recommendations. (If additional space is needed, attach and label accordingly with the appropriate PSEU designation and pollutant):

Annual stack tests are performed on the engines to ensure that the CO and HCHO permit limits are met. The pre catalyst temperature is continuously monitored.

8) **INDICATOR RANGES**: Provide the rationale and justification for the selection of the indicator ranges. The rationale and justification shall indicate how **EACH** indicator range was selected by either a COMPLIANCE OR PERFORMANCE TEST, a TEST PLAN AND SCHEDULE, or by ENGINEERING ASSESSMENTS. Depending on which method is being used for each indicator range, include the specific information required below for that specific indicator range. (If additional space is needed, attach and label accordingly with the appropriate PSEU designation and pollutant):

- COMPLIANCE OR PERFORMANCE TEST (Indicator ranges determined from control device operating parameter data obtained during a compliance or performance test conducted under regulatory specified conditions or under conditions representative of maximum potential emissions under anticipated operating conditions. Such data may be supplemented by engineering assessments and manufacturer's recommendations). The rationale and justification shall INCLUDE a summary of the compliance or performance test results that were used to determine the indicator range, and documentation indicating that no changes have taken place that could result in a significant change in the control system performance or the selected indicator ranges since the compliance or performance test was conducted.

- TEST PLAN AND SCHEDULE (Indicator ranges will be determined from a proposed implementation plan and schedule for installing, testing, and performing any other appropriate activities prior to use of the monitoring). The rationale and justification shall INCLUDE the proposed implementation plan and schedule that will provide for use of the monitoring as expeditiously as practicable after approval of this CAM plan, except that in no case shall the schedule for completing installation and beginning operation of the monitoring exceed 180 days after approval.

- ENGINEERING ASSESSMENTS (Indicator Ranges or the procedures for establishing indicator ranges are determined from engineering assessments and other data, such as manufacturers' design criteria and historical monitoring data, because factors specific to the type of monitoring, control device, or PSEU make compliance or performance testing unnecessary). The rationale and justification shall INCLUDE documentation demonstrating that compliance testing is not required to establish the indicator range.

RATIONALE AND JUSTIFICATION:

The acceptable CO and HCHO limits are set by the permit conditions. Compliance with these limits is determined by a performance test. The acceptable maximum pre catalyst temperature is set by the permit conditions. Monitoring this temperature ensures that the catalyst is operating at an acceptable temperature and meeting the required post control limits.

DVC – EMISSIONS STATEMENT

DATE: 10/03/2024

AURTHOR: Mike Riddell, President, Flare Services

The DEHY Vapor Combustor (DVC) manufactured by Flare Services LLC. will achieve a Destruction efficacy ≥98.0% when operating at temperatures ≥ 1400 deg F & < 1800 deg F.

This includes both the DVC-36 & DVC-48 model lines.

Thank you,

Mike Riddell

President, Flare Services LLC

Tipane, Frederick

From: Knibloe, James <james.knibloe@eqt.com>
Sent: Thursday, October 3, 2024 3:37 PM
To: DEPAirQualityPermitting@wv.gov
Cc: Henry, Regina
Subject: Janus Compressor Station
Attachments: Janus_Title_V_Permit_RO_Change_Signed.pdf

Please find attached the RO change form for the Janus Compressor Station.

Sincerely,

Jim Knibloe, P.E.
Environmental Engineer
EQT Corporation
(412) 525-0609 Cell

EQT CORPORATION
625 Liberty Ave | Pittsburgh, PA 15222-3111
P: 412.553.5700 | www.eqt.com

October 3, 2024

DEPAirQualityPermitting@wv.gov

Ms. Laura M. Crowder
Agency Director
Division of Air Quality
West Virginia Department of Environmental Protection
601 57th St. SE
Charleston, WV 25304

Subject: EQM Gathering Opco, LLC, Janus Compressor Station
Plant ID No. 017-00158
Administrative Update Request

Dear Ms. Crowder:

EQM Gathering Opco, LLC (EQM) has prepared a Class I Administrative Update request for submittal via email for the Class I Administrative Update request for submittal via email for Janus Compressor Station. The Janus Compressor Station currently operates under Title V Permit No. R30-01700158-2019. In accordance with Section 2.6 of Title V Permit No. R30-01700158-2019, an administrative permit amendment may be requested according to the procedures in 45CSR§30-6.4.

It is requested that the Responsible Official be updated to Michael Lauderbaugh (Vice President, EHS; (412) 510-7224; mike.lauderbaugh@eqt.com). This change took place on July 22, 2024.

This application package consists of:

- Title V Permit Revision Application

Please contact James Knibloe of EQT at (412) 525-0609 or James.Knibloe@eqt.com or Regina Henry of EQT at 412-328-3245 or RHenry@eqt.com with any questions.

Sincerely,

DocuSigned by:
Mike Lauderbaugh
A8716FCE3A784B8...

Michael Lauderbaugh
Vice President, EHS
EQT Corporation

Division of Air Quality Permit Application Submittal

Please find attached a permit application for : EQM Gathering Opco, LLC; Janus Compressor Station
[Company Name; Facility Location]

- DAQ Facility ID (for existing facilities only): 017-00158
- Current 45CSR13 and 45CSR30 (Title V) permits associated with this process (for existing facilities only): R30-01700158-2019

- Type of NSR Application (check all that apply):
  - ☐ Construction
  - ☐ Modification
  - ☐ Class I Administrative Update
  - ☐ Class II Administrative Update
  - ☐ Relocation
  - ☐ Temporary
  - ☐ Permit Determination

- Type of 45CSR30 (TITLE V) Revision (if any)**:
  - ☐ Title V Initial
  - ☐ Title V Renewal
  - ☑ Administrative Update
  - ☐ Minor Modification
  - ☐ Significant Modification
  - ☐ Off Permit Change

If any box above is checked, include the Title V revision information as ATTACHMENT S to this application.

- Payment Type:
  - ☐ Credit Card (Instructions to pay by credit card will be sent in the Application Status email.)
  - ☐ Check (Make checks payable to: WVDEP – Division of Air Quality)
    Mail checks to:
    WVDEP – DAQ – Permitting
    Attn: NSR Permitting Secretary
    601 57th Street, SE
    Charleston, WV 25304

Please wait until DAQ emails you the Facility ID Number and Permit Application Number. Please add these identifiers to your check or cover letter with your check.

- If the permit writer has any questions, please contact (all that apply):
  - ☐ Responsible Official/Authorized Representative
    - Name: Michael Lauderbaugh
    - Email: mike.lauderbaugh@eqt.com
    - Phone Number: (412) 510-7224
  - ☑ Company Contact
    - Name: James Knibloe
    - Email: James.Knibloe@eqt.com
    - Phone Number: (412) 525-0609
  - ☑ Consultant
    - Name: Julie Miller
    - Email: jemiller@cecinc.com
    - Phone Number: (763) 218-5081

JANUS COMPRESSOR STATION
ADMINISTRATIVE UPDATE

TITLE V PERMIT REVISION APPLICATION FORM

Submitted To:
WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF AIR QUALITY

Submitted By:
EQM GATHERING OPCO, LLC
2200 ENERGY DRIVE
CANONSBURG, PA 15317

SEPTEMBER 2024

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

TITLE V PERMIT REVISION APPLICATION

PLEASE CHECK TYPE OF TITLE V PERMIT REVISION:

- ☑ **ADMINISTRATIVE AMENDMENT**
- ☐ **MINOR MODIFICATION**
- ☐ **SIGNIFICANT MODIFICATION**
- ☐ **OFF-PERMIT CHANGE**
- ☐ **OPERATIONAL FLEXIBILITY [502(B)(10) CHANGES]**
- ☐ **REOPENING**

TITLE V PERMIT NUMBER:
R30- 01700158-2019

WHEN DID OR WHEN WILL THE CHANGES OCCUR?
MM/DD/YYYY: 05/31/2024

SIC CODES: PRIMARY: 1311 **SECONDARY:**

Refer to "Title V Revision Guidance" (Appendix A, "Title V Permit Revision Flowchart"), for type of revision, and to Section 7 of this Application for Application Completeness and Ability to Operate information

Section 1: General Information

a. Name of Applicant ***(As registered with the WV Secretary of State's Office)*****:**	**b. Facility Name or Location:**
EQM Gathering Opco, LLC	Janus Compressor Station

b. Contact Information		
Responsible Official: Michael Lauderbaugh		Title: Vice President, EHS
Street or P.O. Box: 2200 Energy Drive		
City: Canonsburg	State: PA	Zip: 15317
Telephone Number: (412) 510-7224	Fax Number: ( ) -	E-mail: mike.lauderbaugh@eqt.com
Environmental Contact: James Knibloe		Title: Senior Environmental Engineer
Street or P.O. Box: 625 Liberty Avenue		
City: Pittsburgh	State: PA	Zip: 15222-3114
Telephone Number: (412) 525-0609	Fax Number: ( ) -	E-mail: James.Knibloe@eqt.com
Application Preparer: Julie E. Miller		Title: Project Manager
Company: Civil & Environmental Consultants, Inc.		
Street or P.O. Box: 700 Cherrington Parkway		
City: Coraopolis	State: PA	Zip: 15108
Telephone Number: (763) 218-5081	Fax Number: ( ) -	E-mail: jemiller@cecinc.com
Person to contact if we have questions regarding this Application: James Knibloe		

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

Section 2: Revision Information

a. Description of Changes Associated with this Permit Revision

Provide a general description of changes to the facility.

A request is being made to update the Responsible Official listed in Title V Permit to Operate No. R30-01700158-2019 to Michael Lauderbaugh (VP EHS; (412) 510-7224; mike.lauderbaugh@eqt.com). There are no changes to the facility operations.

b. 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 as **ATTACHMENT A.**

c. Provide a **Plot Plan(s**) if new emission points were added since latest revision, e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the new/modified stationary source(s) is located as **ATTACHMENT B.** For instructions, refer to "***Plot Plan - Guidelines***"**.**

d. Provide a detailed **Process Flow Diagram(s)** if new emission points were added since latest revision, showing each new/modified process or emissions unit as **ATTACHMENT C.** Process Flow Diagrams should show all emission units, control equipment, emission points, and their relationships.

e. Emission Units Table

Fill out the **Emission Units Table** for new and/or modified equipment and provide it as **ATTACHMENT D**.

f. Emission Units Form(s)

For each new and/or modified emission unit(s) with applicable requirement(s) listed in the **Emission Units Table**, fill out and provide an **Emission Unit Form(s)** as **ATTACHMENT E**.

Are you in compliance with all facility-wide applicable requirements? ☐ Yes ☐ No

For each new and/or modified emission unit not in compliance with an applicable requirement, fill out a **Schedule of Compliance Form** as **ATTACHMENT F**.

g. Control Devices

For each new and/or modified control device listed in the **Emission Units Table**, fill out and provide an **Air Pollution Control Device Form(s)** as **ATTACHMENT G**.

For any control device that is required on an emission unit in order to meet a standard or limitation for which the potential pre-control device emissions of an applicable regulated air pollutant is greater than or equal to the Part 70 Major Source Threshold level, refer to the **Compliance Assurance Monitoring (CAM) Form(s)** for CAM applicability. If applicable, please check appropriate box in Section 3(a) below, fill out and provide these forms for each Pollutant Specific Emission Unit (PSEU) as **ATTACHMENT H**.

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

Section 3: New Applicable Requirements

a. New Applicable Requirements Summary

Mark all applicable requirements associated with the changes involved with this permit revision:

☐ SIP	☐ FIP
☐ Minor source NSR (45CSR13)	☐ PSD (45CSR14)
☐ NESHAP (45CSR34)	☐ Nonattainment NSR (45CSR19)
☐ Section 111 NSPS (Subpart(s)_____)	☐ Section 112(d) MACT standards (Subpart(s)_____)
☐ Section 112(g) Case-by-case MACT	☐ 112(r) RMP
☐ Section 112(i) Early reduction of HAP	☐ Consumer/commercial prod. reqts., section 183(e)
☐ Section 129 Standards/Reqts.	☐ Stratospheric ozone (Title VI)
☐ Tank vessel reqt., section 183(f)	☐ Emissions cap 45CSR§30-2.6.1
☐ NAAQS, increments or visibility (temp. sources)	☐ 45CSR27 State enforceable only rule
☐ 45CSR4 State enforceable only rule	☐ Acid Rain (Title IV, 45CSR33)
☐ Emissions Trading and Banking (45CSR28)	☐ Compliance Assurance Monitoring (40CFR64)
☐ CAIR NO_x Annual Trading Program (45CSR39)	☐ CAIR NO_x Ozone Season Trading Program (45CSR26)
☐ CAIR SO_2 Trading Program (45CSR41)	

b. Non Applicability Determinations

List all requirements, which the source has determined not applicable to this permit revision and for which a permit shield is requested. The listing shall also include the rule citation and a rationale for the determination.

☐ **Permit Shield Requested** *(not applicable to Minor Modifications, Off-Permit Changes, or for Operational Flexibility)*

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

c. Suggested Title V Draft Permit Language

Provide **Suggested Title V Draft Permit language** for the proposed Title V Permit revision (including all applicable requirements associated with the permit revision and any associated monitoring /recordkeeping/ reporting requirements), OR attach a marked up pages of current Title V Permit as **ATTACHMENT I**. Please include appropriate citations (Permit or Consent Order number, condition number and/or rule citation (e. g. 45CSR§7-4.1)) for those requirements being added / revised.

d. Active NSR Permits/Permit Determinations/Consent Orders Associated With This Permit Revision

Permit or Consent Order Number	Date of Issuance (MM/DD/YYYY)	Permit/Consent Order Condition Number

e. Inactive NSR Permits/Obsolete Permit or Consent Orders Conditions Associated With This Revision

Permit Number	Date of Issuance (MM/DD/YYYY)	Permit/Consent Order Condition Number

Section 4: Change in Potential Emissions

Pollutant	Change in Potential Emissions (+ or -), TPY	For Off-Permit Changes: Provide Total Aggregated Emissions Increase Since Last Permit/Modification

Provide **Supporting Emission Calculations/Estimations** as **ATTACHMENT J**.

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

Section 5: Certification of Information

a. Certification For Use Of Minor Modification Procedures ***(Required Only for Minor Modification Requests)***

Note:	*This certification must be signed by a responsible official. Applications without a signed certification will be returned as incomplete. The criteria for allowing the use of Minor Modification Procedures are as follows:*

i. Proposed changes do not violate any applicable requirement;

ii. Proposed changes do not involve significant changes to existing monitoring, reporting, or recordkeeping requirements in the permit;

iii. Proposed changes do not require or change a case-by-case determination of an emission limitation or other standard, or a source-specific determination for temporary sources of ambient air quality impacts, or a visibility increment analysis;

iv. Proposed changes do not seek to establish or change a permit term or condition for which there is no underlying applicable requirement and which permit or condition has been used to avoid an applicable requirement to which the source would otherwise be subject (synthetic minor). Such terms and conditions include, but are not limited to a federally enforceable emissions cap used to avoid classification as a modification under any provision of Title I or any alternative emissions limit approved pursuant to regulations promulgated under § 112(j)(5) of the Clean Air Act;

v. Proposed changes do not involve preconstruction review under Title I of the Clean Air Act or 45CSR14 and 45CSR19;

vi. Proposed changes are not required under any rule of the Director to be processed as a significant modification;

Notwithstanding subparagraph 45CSR§30-6.5.a.1.A. (items i through vi above), minor permit modification procedures may be used for permit modifications involving the use of economic incentives, marketable permits, emissions trading, and other similar approaches, to the extent that such minor permit modification procedures are explicitly provided for in rules of the Director which are approved by the U.S. EPA as a part of the State Implementation Plan under the Clean Air Act, or which may be otherwise provided for in the Title V operating permit issued under 45CSR30.

Pursuant to 45CSR§30-6.5.a.2.C., the proposed modification contained herein meets the criteria for use of Minor permit modification procedures as set forth in Section 45CSR§30-6.5.a.1.A. The use of Minor permit modification procedures are hereby requested for processing of this application.

(Signed):	_____ *(Please use blue ink)*	Date:	____ / ____ / ____ *(Please use blue ink)*
Named (typed):		Title:	

***b.* Certification of Truth, Accuracy and Completeness and Certification of Compliance**
(Required For All Revision Requests)

Note:	*This Certification must be signed by a responsible official. Applications without a signed certification will be returned as incomplete.*

Certification of Truth, Accuracy and Completeness

I certify that I am a responsible official (as defined at 45CSR§30-2.38) and am accordingly authorized to make this submission on behalf of the owners or operators of the source described in this document and its attachments. I certify under penalty of law that I have personally examined and am familiar with the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine and/or imprisonment.

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.

Responsible official (type or print)

Name: Michael Lauderbaugh | Title: Vice President, EHS

Responsible official's signature:

Signature: DocuSigned by: Mike Lauderbaugh A8716FCE3A784B8... *(Please use blue ink)*

Signature Date: 10/3/2024 | 12:18 PM EDT *(Please use blue ink)*

Section 6: Attachments

Note: Please check all applicable attachments included with this permit application:	
☐	ATTACHMENT A: Business Confidentiality Claims
☐	ATTACHMENT B: Plot Plan(s)
☐	ATTACHMENT C: Process Flow Diagram(s)
☐	ATTACHMENT D: Emission Units Table
☐	ATTACHMENT E: Emission Unit Form(s)
☐	ATTACHMENT F: Schedule of Compliance Form(s)
☐	ATTACHMENT G: Air Pollution Control Device Form(s)
☐	ATTACHMENT H: Compliance Assurance Monitoring Form(s)
☐	ATTACHMENT I: Suggested Title V Draft Permit Language
☐	ATTACHMENT J: Supporting Emission Calculations/Estimations

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

Section 7: Application Completeness and Ability to Operate information for different types of Title V Permit revisions

(Refer to "Title V Revision Guidance" for more information)

Type of Revision	Application/Notification Requirements	Ability to Operate
Administrative Amendment	☑ Description of change ☑ Supplemental information (rationale) ☑ Certification of application and compliance (Section 5(b))	Upon submittal of the application
Minor Modification	☐ Description of change ☐ Associated change in emissions ☐ Sample Calculations/estimations for determining emissions ☐ List of new applicable requirements associated with changes ☐ List of R13/R14 permits associated with the changes ☐ Suggested draft permit language ☐ Certification for use of Minor Modification (Section 5(a)) ☐ Certification of application and compliance (Section 5(b)) ***No Permit Shield***	After seven (7) days from the submittal of the application, or upon issuance of the R13/R14 permit (if any), whichever is later
Significant Modification	☐ Description of change ☐ Associated change in emissions ☐ Sample Calculations/estimations for determining emissions ☐ List of R13/R14 permits associated with the changes ☐ List of new applicable requirements associated with changes ☐ Request for permit shield ☐ Updated drawings, plot plans, process flow diagrams, etc. ☐ Certification of application and compliance (Section 5(b))	Upon issuance of the modified Title V permit (if changes either conflict with, or are prohibited by existing Title V Permit terms/ conditions), OR upon obtaining of proper R13/ R14 Permit for first 12 months (if changes neither conflict with, nor are prohibited by existing Title V Permit terms/conditions)
Off-Permit Changes	☐ Notification/application to DAQ and U.S.E.P.A. within 2 business days of the change ☐ Description of the change ☐ The date on which the change will occur or has occurred ☐ Pollutants and amounts emitted ☐ Sample Calculations/estimations for determining emissions ☐ Any new applicable requirements that will apply to changes ☐ Certification of application and compliance (Section 5(b)) ***No Permit Shield***	After two (2) days from the submittal of the application
Operational Flexibility	☐ Notification/application submitted to DAQ and U.S.E.P.A. in advance (7 days prior to making changes) ☐ Description of the change ☐ The date on which the change is to occur ☐ Permit terms and conditions affected by the change ☐ Certification of application and compliance (Section 5(b)) ***No Permit Shield***	After seven (7) days from the submittal of the application/notification to DAQ and EPA
Reopening	☐ Description of change ☐ List of new applicable requirements associated with changes ☐ Suggested draft permit language ☐ Certification of application and compliance (Section 5(b))	Ability to operate is not reflected by the changes

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

DocuSign

Certificate Of Completion

Envelope Id: 3B1A0053E2B644C7AF6F363376B620BC
Status: Completed
Subject: Complete with Docusign: Janus Title V Permit RO Change.pdf
Source Envelope:
Document Pages: 10
Signatures: 2
Certificate Pages: 1
Initials: 0
AutoNav: Enabled
EnvelopeId Stamping: Enabled
Time Zone: (UTC-05:00) Eastern Time (US & Canada)

Envelope Originator:
Regina Henry
625 Liberty Ave Ste 1700
Pittsburgh, PA 15222
rhenry@eqt.com
IP Address: 24.144.177.134

Record Tracking

Status: Original
10/3/2024 10:48:03 AM
Holder: Regina Henry
rhenry@eqt.com
Location: DocuSign

Signer Events	Signature	Timestamp
Mike Lauderbaugh mike.lauderbaugh@eqt.com Vice President of EHS EQT Corporation Security Level: Email, Account Authentication (None)	DocuSigned by:  A8716FCE3A784B8... Signature Adoption: Pre-selected Style Using IP Address: 73.52.232.59	Sent: 10/3/2024 10:49:12 AM Viewed: 10/3/2024 12:18:26 PM Signed: 10/3/2024 12:18:38 PM

Electronic Record and Signature Disclosure:
Not Offered via DocuSign

In Person Signer Events	Signature	Timestamp

Editor Delivery Events	Status	Timestamp

Agent Delivery Events	Status	Timestamp

Intermediary Delivery Events	Status	Timestamp

Certified Delivery Events	Status	Timestamp

Carbon Copy Events	Status	Timestamp

Witness Events	Signature	Timestamp

Notary Events	Signature	Timestamp

Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	10/3/2024 10:49:12 AM
Certified Delivered	Security Checked	10/3/2024 12:18:26 PM
Signing Complete	Security Checked	10/3/2024 12:18:38 PM
Completed	Security Checked	10/3/2024 12:18:38 PM

Payment Events	Status	Timestamps

Tipane, Frederick <frederick.tipane@wv.gov>

Re: [EXTERNAL] Re: Michael Lauderbaugh RO Contact Information

1 message

Tipane, Frederick <frederick.tipane@wv.gov> Wed, Oct 2, 2024 at 10:05 AM
To: "Knibloe, James" <james.knibloe@eqt.com>

No problem, thanks!

On Wed, Oct 2, 2024 at 10:05 AM Knibloe, James <james.knibloe@eqt.com> wrote:

> Yes, sorry I left that out.
>
> 400 Woodcliff Drive
>
> Canonsburg, PA 15317
>
> ---
>
> **From:** Tipane, Frederick <frederick.tipane@wv.gov>
> **Sent:** Wednesday, October 2, 2024 10:02 AM
> **To:** Knibloe, James <james.knibloe@eqt.com>
> **Subject:** [EXTERNAL] Re: Michael Lauderbaugh RO Contact Information
>
> ---
>
> Thanks!
>
> Do you have his mailing address?
>
> On Wed, Oct 2, 2024 at 9:59 AM Knibloe, James <james.knibloe@eqt.com> wrote:
>
> > Michael Lauderbaugh
> >
> > Mike.lauderbaugh@eqt.com
> >
> > 412-510-7224
> >
> > *To learn about EQT's environmental, social and governance efforts visit: https://esg.eqt.com*

Tipane, Frederick <frederick.tipane@wv.gov>

Request for additional CAM Plan: Janus Compressor Station Title V CAM Plan Renewal Permit R30-01700158-2024

1 message

Tipane, Frederick <frederick.tipane@wv.gov> Tue, Oct 1, 2024 at 10:48 AM
To: "Knibloe, James" <james.knibloe@eqt.com>

Jim,

The purpose of my telephone call to you Yesterday was to give you a heads up regarding a request for an additional CAM Plan. During the processing of the renewal permit, I became aware of the need for a CAM plan for the compressor engines regarding carbon monoxide (CO) and formaldehyde (HCHO). Hence, I am requesting the submission of a CAM Plan for the Compressor Engines ENG-001, ENG-002, ENG-003 and ENG-004 for CO and HCHO. The limits for these pollutants are applicable through permit R13-3269B. Although 40 CFR 60 Subpart JJJJ is applicable to the engines, the R13-3269B limit for CO is more stringent than the Subpart JJJJ limits and Subpart JJJJ does not contain limits for HCHO. Therefore the engines cannot be exempt from CAM under 40 CFR §64.2(b)(1)(i).

Please submit the CAM plan as soon as possible but no later than Thursday October 10, 2024.

I also wanted to discuss the responsible official (RO) for the Janus Compressor Station. I noticed on the 2024 Semi-Annual Report submitted on September 11, 2024, the RO that signed the report was Michael Laudebaugh. I was unable to confirm that the paperwork was submitted to the WVDAQ designating him as the RO. Please find attached a form that will need to be filled out and submitted to the DAQ designating Mr Lauderbaugh as the RO.

As we discussed, I will give you a call Wednesday morning when you return to work or if you prefer you can give me a call at 304-414-1910.

Regards,
Fred

--

Frederick Tipane

Division of Air Quality

601 57th Street, SE

Charleston, WV 25304
(304) 414-1910
frederick.tipane@wv.gov

2 attachments

Authority of Corporation Form.pdf
304K

Authority of Corporation.doc
53K

Tipane, Frederick <frederick.tipane@wv.gov>

Re: Question regarding new Responsible Official

1 message

Scott, Kimberly A <kimberly.a.scott@wv.gov> Thu, Sep 26, 2024 at 12:42 PM
To: "Tipane, Frederick" <frederick.tipane@wv.gov>

You're welcome.

On Thu, Sep 26, 2024 at 12:25 PM Tipane, Frederick <frederick.tipane@wv.gov> wrote:
> Thanks Kim. I'll forward it to them.
>
> Fred
>
> On Thu, Sep 26, 2024 at 12:22 PM Scott, Kimberly A <kimberly.a.scott@wv.gov> wrote:
> > Fred,
> >
> > Attached is the form that will need to be filled out and returned so we can update the RO in the system.
> >
> > Kim
> >
> > On Thu, Sep 26, 2024 at 11:55 AM Mink, Stephanie R <stephanie.r.mink@wv.gov> wrote:
> > > You can check with Kim Scott or Megan Grose to see if they have officially filed anything. If not, there is a form on the website to be completed that can be submitted to either Kim or Megan; I have cc'd them to let them know what you are looking for.
> > >
> > > Thanks
> > > Stephanie
> > >
> > > On Thu, Sep 26, 2024 at 11:48 AM Tipane, Frederick <frederick.tipane@wv.gov> wrote:
> > > > Hi Stephanie,
> > > >
> > > > I have a question regarding the responsible official (RO) for EQM Gathering, Opco, LLC's Janus Compressor Station.
> > > >
> > > > When I sent an email to the RO and environmental contact in August, I was told that Equitrans Midstream was acquired by EQT Corporation and that they were in the process of updating the RO. They never followed up with me regarding the new RO. I looked at the semi annual report that was submitted on September 11, 2024 and it shows *Michael Lauderbuagh- Vice President, EHS* as the RO.
> > > >
> > > > My question is: Who in our office is now taking care of company name changes transfers and PO changes? I want to ensure that the proper paperwork has been submitted for the new RO.
> > > >
> > > > Thanks for any assistance.
> > > > Fred
> > > >
> > > > –
> > > >
> > > > Frederick Tipane
> > > >
> > > > Division of Air Quality
> > > >
> > > > 601 57th Street, SE
> > > >
> > > > Charleston, WV 25304
> > > > (304) 414-1910
> > > > frederick.tipane@wv.gov

Tipane, Frederick <frederick.tipane@wv.gov>

RE: FW: [EXTERNAL] Janus Compressor Station Title V CAM Plan Renewal Permit R30-01700158-2024

1 message

Knibloe, James <james.knibloe@eqt.com> Tue, Sep 3, 2024 at 4:46 PM
To: "Tipane, Frederick" <frederick.tipane@wv.gov>

Please find requested CAM plan attached.

Thanks

Jim

From: Tipane, Frederick frederick.tipane@wv.gov
Sent: Thursday, August 29, 2024 10:48 AM
To: Knibloe, James <james.knibloe@eqt.com>
Subject: Re: FW: [EXTERNAL] Janus Compressor Station Title V CAM Plan Renewal Permit R30-01700158-2024

Thank you for the update.

Fred

On Thu, Aug 29, 2024 at 10:19 AM Knibloe, James <james.knibloe@eqt.com> wrote:

> Fred,
>
> I apologize for not submitting the CAM plan by the requested date. I am working on it but required some information from outside sources. I will get it to you by Tuesday 9/3/2024.
>
> Thanks
>
> **Jim Knibloe, P.E.**
>
> Environmental Engineer
>
> EQT Corporation
>
> (412) 525-0609 Cell

From: Tipane, Frederick <frederick.tipane@wv.gov>
Sent: Wednesday, August 14, 2024 2:25 PM
To: Kraus, Matthew <matthew.kraus@eqt.com>
Cc: Knibloe, James <james.knibloe@eqt.com>; Koulianos, Anthony <anthony.koulianos@eqt.com>; Morris, Dave <dmorris@cecinc.com>
Subject: Re: FW: [EXTERNAL] Janus Compressor Station Title V CAM Plan Renewal Permit R30-01700158-2024

Thank you for the update. I did receive an undeliverable email message regarding Jack Mackin. Please let me know as soon as possible as to who will be/is the Responsible official for the Janus Station.

Fred

On Wed, Aug 14, 2024 at 2:16 PM Kraus, Matthew <matthew.kraus@eqt.com> wrote:

> Hi Jim,
>
> Please see the email below regarding a CAM Plan for Janus.
>
> Mr. Tipane,
>
> On July 22, 2024, Equitrans Midstream was acquired by EQT Corporation and Jack Mackin in no longer with the company. We are in the process of updating our Ros.

Matt Kraus | EQT Corporation

Environmental Engineer

M: (412) 260-1723

From: Tipane, Frederick <frederick.tipane@wv.gov>
Sent: Wednesday, August 14, 2024 2:00 PM
To: Mackin, Jack <JMackin@equitransmidstream.com>

Cc: Kraus, Matthew <MKraus@equitransmidstream.com>
Subject: [EXTERNAL] Janus Compressor Station Title V CAM Plan Renewal Permit R30-01700158-2024

While processing the renewal permit (R30-01700158-2024) for EQM Gathering Opco, LLC's Janus Compressor Station, it has been determined that since the each of the dehydration unit/still columns DEY-001 and DEHY-002 pre-control VOC potential emissions (339.92 tpy - *taken from R13-3269 application*) are greater than the major source threshold (i.e., 100 tpy) and that a control device for each unit is used to meet an limit (6.80 tpy), each unit is subject to 40 CFR Part 64 Compliance Assurance Monitoring (CAM) for VOC.

The Title V renewal application indicated that the units are not subject to CAM because the units are subject to 40 CFR 63 Subpart HH and that the existing Title V permit (R30-01700158-2019) specifies a continuous compliance demonstration for the two flares (FLARE-001 and FLARE-002). In regard to HAP emissions, the exemption is applied since the units are subject to Subpart HH which establishes standards for HAPs and was proposed after November 15, 1990. However in regard to the VOC emissions, the existing Title V permit does not contain sufficient requirements to satisfy the requirements and exemption in the CAM rule. Therefore, I am requesting that a CAM Plan be submitted for each of the dehydration unit/still columns DEY-001 and DEHY-002 for VOC.

For your convenience, I have attached the "Attachment H - Compliance Assurance Monitoring (CAM)Plan Form" of the Title V application. I have also attached the "Compliance Assurance Monitoring Review" checklist. Section I of the checklist should be completed to ensure that the CAM Plan can be approved.

Please submit the CAM Plan as soon as possible but no later than Wednesday, August 28, 2024.

Feel free to contact me with any questions or concerns with this determination and request.

Regards,

Fred Tipane

--

Frederick Tipane

Division of Air Quality

601 57th Street, SE

Charleston, WV 25304
(304) 414-1910

frederick.tipane@wv.gov

To learn about EQT's environmental, social and governance efforts visit: https://esg.eqt.com

H - CAM Plan Janus 090324.pdf
328K

Tipane, Frederick <frederick.tipane@wv.gov>

Re: FW: [EXTERNAL] Janus Compressor Station Title V CAM Plan Renewal Permit R30-01700158-2024

1 message

Tipane, Frederick <frederick.tipane@wv.gov> Thu, Aug 29, 2024 at 10:48 AM
To: "Knibloe, James" <james.knibloe@eqt.com>

Thank you for the update.

Fred

On Thu, Aug 29, 2024 at 10:19 AM Knibloe, James <james.knibloe@eqt.com> wrote:

> Fred,
>
> I apologize for not submitting the CAM plan by the requested date. I am working on it but required some information from outside sources. I will get it to you by Tuesday 9/3/2024.
>
> Thanks
>
> **Jim Knibloe, P.E.**
>
> Environmental Engineer
>
> EQT Corporation
>
> (412) 525-0609 Cell
>
> ---
>
> **From:** Tipane, Frederick <frederick.tipane@wv.gov>
> **Sent:** Wednesday, August 14, 2024 2:25 PM
> **To:** Kraus, Matthew <matthew.kraus@eqt.com>
> **Cc:** Knibloe, James <james.knibloe@eqt.com>; Koulianos, Anthony <anthony.koulianos@eqt.com>; Morris, Dave <dmorris@cecinc.com>
> **Subject:** Re: FW: [EXTERNAL] Janus Compressor Station Title V CAM Plan Renewal Permit R30-01700158-2024
>
> Thank you for the update. I did receive an undeliverable email message regarding Jack Mackin. Please let me know as soon as possible as to who will be/is the Responsible official for the Janus Station.
>
> Fred
>
> On Wed, Aug 14, 2024 at 2:16 PM Kraus, Matthew <matthew.kraus@eqt.com> wrote:

Hi Jim,

Please see the email below regarding a CAM Plan for Janus.

Mr. Tipane,

On July 22, 2024, Equitrans Midstream was acquired by EQT Corporation and Jack Mackin in no longer with the company. We are in the process of updating our Ros.

Matt Kraus | EQT Corporation

Environmental Engineer

M: (412) 260-1723

From: Tipane, Frederick <frederick.tipane@wv.gov>
Sent: Wednesday, August 14, 2024 2:00 PM
To: Mackin, Jack <JMackin@equitransmidstream.com>
Cc: Kraus, Matthew <MKraus@equitransmidstream.com>
Subject: [EXTERNAL] Janus Compressor Station Title V CAM Plan Renewal Permit R30-01700158-2024

While processing the renewal permit (R30-01700158-2024) for EQM Gathering Opco, LLC's Janus Compressor Station, it has been determined that since the each of the dehydration unit/still columns DEY-001 and DEHY-002 pre-control VOC potential emissions (339.92 tpy - *taken from R13-3269 application*) are greater than the major source threshold (i.e., 100 tpy) and that a control device for each unit is used to meet an limit (6.80 tpy), each unit is subject to 40 CFR Part 64 Compliance Assurance Monitoring (CAM) for VOC.

The Title V renewal application indicated that the units are not subject to CAM because the units are subject to 40 CFR 63 Subpart HH and that the existing Title V permit (R30-01700158-2019) specifies a continuous compliance demonstration for the two flares (FLARE-001 and FLARE-002). In regard to HAP emissions, the exemption is applied since the units are subject to Subpart HH which establishes standards for HAPs and was proposed after November 15, 1990. However in regard to the VOC emissions, the existing Title V permit does not contain sufficient requirements to satisfy the requirements and exemption in the CAM rule. Therefore, I am requesting that a CAM Plan be submitted for each of the dehydration unit/still columns DEY-001 and DEHY-002 for VOC.

For your convenience, I have attached the "Attachment H - Compliance Assurance Monitoring (CAM)Plan Form" of the Title V application. I have also attached the "Compliance Assurance Monitoring Review" checklist. Section I of the checklist should be completed to ensure that the CAM Plan can be approved.

Please submit the CAM Plan as soon as possible but no later than Wednesday, August 28, 2024.

Feel free to contact me with any questions or concerns with this determination and request.

Regards,

Fred Tipane

–

Frederick Tipane

Division of Air Quality

601 57th Street, SE

Charleston, WV 25304
(304) 414-1910

frederick.tipane@wv.gov

To learn about EQT's environmental, social and governance efforts visit: https://esg.eqt.com

Tipane, Frederick <frederick.tipane@wv.gov>

Automatic reply: FW: [EXTERNAL] Janus Compressor Station Title V CAM Plan Renewal Permit R30-01700158-2024

1 message

Morris, Dave <dmorris@cecinc.com> Wed, Aug 14, 2024 at 2:25 PM
To: "Tipane, Frederick" <frederick.tipane@wv.gov>

Hello,

I'm travelling and will be in the out of office Wednesdat August 14 through Friday August 16. I will be checking emails in the evening during this time. For other urget matters contact Leah Blinn or Amanda Black. If this is an emergency please call my cell at 724-579-8860.

Tipane, Frederick <frederick.tipane@wv.gov>

Re: FW: [EXTERNAL] Janus Compressor Station Title V CAM Plan Renewal Permit R30-01700158-2024

1 message

Tipane, Frederick <frederick.tipane@wv.gov> Wed, Aug 14, 2024 at 2:25 PM
To: "Kraus, Matthew" <matthew.kraus@eqt.com>
Cc: "Knibloe, James" <james.knibloe@eqt.com>, "Koulianos, Anthony" <anthony.koulianos@eqt.com>, "Morris, Dave" <dmorris@cecinc.com>

Thank you for the update. I did receive an undeliverable email message regarding Jack Mackin. Please let me know as soon as possible as to who will be/is the Responsible official for the Janus Station.

Fred

On Wed, Aug 14, 2024 at 2:16 PM Kraus, Matthew <matthew.kraus@eqt.com> wrote:

> Hi Jim,
>
> Please see the email below regarding a CAM Plan for Janus.
>
> Mr. Tipane,
>
> On July 22, 2024, Equitrans Midstream was acquired by EQT Corporation and Jack Mackin in no longer with the company. We are in the process of updating our Ros.
>
> **Matt Kraus | EQT Corporation**
>
> Environmental Engineer
>
> M: (412) 260-1723
>
> **From:** Tipane, Frederick <frederick.tipane@wv.gov>
> **Sent:** Wednesday, August 14, 2024 2:00 PM
> **To:** Mackin, Jack <JMackin@equitransmidstream.com>

Cc: Kraus, Matthew <MKraus@equitransmidstream.com>
Subject: [EXTERNAL] Janus Compressor Station Title V CAM Plan Renewal Permit R30-01700158-2024

While processing the renewal permit (R30-01700158-2024) for EQM Gathering Opco, LLC's Janus Compressor Station, it has been determined that since the each of the dehydration unit/still columns DEY-001 and DEHY-002 pre-control VOC potential emissions (339.92 tpy - *taken from R13-3269 application*) are greater than the major source threshold (i.e., 100 tpy) and that a control device for each unit is used to meet an limit (6.80 tpy), each unit is subject to 40 CFR Part 64 Compliance Assurance Monitoring (CAM) for VOC.

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Regards,

Fred Tipane

--

Frederick Tipane

Division of Air Quality

601 57th Street, SE

Charleston, WV 25304
(304) 414-1910

> frederick.tipane@wv.gov
>
> *To learn about EQT's environmental, social and governance efforts visit: https://esg.eqt.com*

Tipane, Frederick <frederick.tipane@wv.gov>

FW: [EXTERNAL] Janus Compressor Station Title V CAM Plan Renewal Permit R30-01700158-2024

1 message

Kraus, Matthew <matthew.kraus@eqt.com> Wed, Aug 14, 2024 at 2:15 PM
To: "Knibloe, James" <james.knibloe@eqt.com>, "Tipane, Frederick" <frederick.tipane@wv.gov>
Cc: "Koulianos, Anthony" <anthony.koulianos@eqt.com>, "Morris, Dave" <dmorris@cecinc.com>

Hi Jim,

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Mr. Tipane,

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Matt Kraus | EQT Corporation

Environmental Engineer

M: (412) 260-1723

From: Tipane, Frederick <frederick.tipane@wv.gov>
Sent: Wednesday, August 14, 2024 2:00 PM
To: Mackin, Jack <JMackin@equitransmidstream.com>
Cc: Kraus, Matthew <MKraus@equitransmidstream.com>
Subject: [EXTERNAL] Janus Compressor Station Title V CAM Plan Renewal Permit R30-01700158-2024

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Fred Tipane

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Frederick Tipane

Division of Air Quality

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Charleston, WV 25304
(304) 414-1910

frederick.tipane@wv.gov

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2 attachments

H - CAM Plan.pdf
109K

CAM review checklist.pdf
183K

Tipane, Frederick <frederick.tipane@wv.gov>

Read: [EXTERNAL] Janus Compressor Station Title V CAM Plan Renewal Permit R30-01700158-2024

1 message

Kraus, Matthew <MKraus@equitransmidstream.com> Wed, Aug 14, 2024 at 2:12 PM
To: "frederick.tipane@wv.gov" <frederick.tipane@wv.gov>

Your message

To: Kraus, Matthew
Subject: [EXTERNAL] Janus Compressor Station Title V CAM Plan Renewal Permit R30-01700158-2024
Sent: Wednesday, August 14, 2024 2:00:29 PM (UTC-05:00) Eastern Time (US & Canada)

was read on Wednesday, August 14, 2024 2:12:10 PM (UTC-05:00) Eastern Time (US & Canada).

Tipane, Frederick <frederick.tipane@wv.gov>

Automatic reply: [EXTERNAL] Janus Compressor Station Title V CAM Plan Renewal Permit R30-01700158-2024

1 message

Mackin, Jack <JMackin@equitransmidstream.com> Wed, Aug 14, 2024 at 2:03 PM
To: "Tipane, Frederick" <frederick.tipane@wv.gov>

This email address is no longer in service.

Tipane, Frederick <frederick.tipane@wv.gov>

Janus Compressor Station Title V CAM Plan Renewal Permit R30-01700158-2024

1 message

Tipane, Frederick <frederick.tipane@wv.gov> Wed, Aug 14, 2024 at 2:00 PM
To: Jack Mackin <jmackin@equitransmidstream.com>
Cc: "Kraus, Matthew" <MKraus@equitransmidstream.com>

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Please submit the CAM Plan as soon as possible but no later than Wednesday, August 28, 2024.

Feel free to contact me with any questions or concerns with this determination and request.

Regards,
Fred Tipane

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Frederick Tipane

Division of Air Quality

601 57th Street, SE

Charleston, WV 25304
(304) 414-1910
frederick.tipane@wv.gov

2 attachments

H - CAM Plan.pdf
109K

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183K

ATTACHMENT H - Compliance Assurance Monitoring (CAM) Plan Form

For definitions and information about the CAM rule, please refer to 40 CFR Part 64. Additional information (including guidance documents) may also be found at http://www.epa.gov/ttn/emc/cam.html

CAM APPLICABILITY DETERMINATION

1) Does the facility have a PSEU (Pollutant-Specific Emissions Unit considered separately with respect to **EACH** regulated air pollutant) that is subject to CAM (40 CFR Part 64), which must be addressed in this CAM plan submittal? To determine applicability, a PSEU must meet **all** of the following criteria (*If No, then the remainder of this form need not be completed*): ☐ YES ☐ NO

a. The PSEU is located at a major source that is required to obtain a Title V permit;

b. The PSEU is subject to an emission limitation or standard for the applicable regulated air pollutant that is NOT exempt;

LIST OF EXEMPT EMISSION LIMITATIONS OR STANDARDS:

- NSPS (40 CFR Part 60) or NESHAP (40 CFR Parts 61 and 63) proposed after 11/15/1990.
- Stratospheric Ozone Protection Requirements.
- Acid Rain Program Requirements.
- Emission Limitations or Standards for which a WVDEP Division of Air Quality Title V permit specifies a continuous compliance determination method, as defined in 40 CFR §64.1.
- An emission cap that meets the requirements specified in 40 CFR §70.4(b)(12).

c. The PSEU uses an add-on control device (as defined in 40 CFR §64.1) to achieve compliance with an emission limitation or standard;

d. The PSEU has potential pre-control device emissions of the applicable regulated air pollutant that are equal to or greater than the Title V Major Source Threshold Levels; AND

e. The PSEU is NOT an exempt backup utility power emissions unit that is municipally-owned.

BASIS OF CAM SUBMITTAL

2) Mark the appropriate box below as to why this CAM plan is being submitted as part of an application for a Title V permit:

☐ RENEWAL APPLICATION. **ALL** PSEUs for which a CAM plan has NOT yet been approved need to be addressed in this CAM plan submittal.

☐ INITIAL APPLICATION (submitted after 4/20/98). **ONLY** large PSEUs (i. e., PSEUs with potential post-control device emissions of an applicable regulated air pollutant that are equal to or greater than Major Source Threshold Levels) need to be addressed in this CAM plan submittal.

☐ SIGNIFICANT MODIFICATION TO LARGE PSEUs. **ONLY** large PSEUs being modified after 4/20/98 need to be addressed in this cam plan submittal. For large PSEUs with an approved CAM plan, Only address the appropriate monitoring requirements affected by the significant modification.

3) [a] BACKGROUND DATA AND INFORMATION					
Complete the following table for **all** PSEUs that need to be addressed in this CAM plan submittal. This section is to be used to provide background data and information for each PSEU In order to supplement the submittal requirements specified in 40 CFR §64.4. If additional space is needed, attach and label accordingly.					
PSEU DESIGNATION	DESCRIPTION	POLLUTANT	CONTROL DEVICE	[b] EMISSION LIMITATION or STANDARD	[c] MONITORING REQUIREMENT
EXAMPLE Boiler No. 1	Wood-Fired Boiler	PM	Multiclone	45CSR§2-4.1.c.; 9.0 lb/hr	Monitor pressure drop across multiclone: Weekly inspection of multiclone

[a] If a control device is common to more than one PSEU, one monitoring plan may be submitted for the control device with the affected PSEUs identified and any conditions that must be maintained or monitored in accordance with 40 CFR §64.3(a). If a single PSEU is controlled by more than one control device similar in design and operation, one monitoring plan for the applicable control devices may be submitted with the applicable control devices identified and any conditions that must be maintained or monitored in accordance with 40 CFR §64.3(a).

[b] Indicate the emission limitation or standard for any applicable requirement that constitutes an emission limitation, emission standard, or standard of performance (as defined in 40 CFR §64.1).

[c] Indicate the monitoring requirements for the PSEU that are required by an applicable regulation or permit condition.

CAM MONITORING APPROACH CRITERIA

Complete this section for **EACH** PSEU that needs to be addressed in this CAM plan submittal. This section may be copied as needed for each PSEU. This section is to be used to provide monitoring data and information for EACH indicator selected for EACH PSEU in order to meet the monitoring design criteria specified in 40 CFR §64.3 and §64.4. if more than two indicators are being selected for a PSEU or if additional space is needed, attach and label accordingly with the appropriate PSEU designation, pollutant, and indicator numbers.

4a) PSEU Designation:	**4b) Pollutant:**	**4c) [a] Indicator No. 1:**	**4d) [a] Indicator No. 2:**

5a) GENERAL CRITERIA Describe the MONITORING APPROACH used to measure the indicators:		
[b] Establish the appropriate INDICATOR RANGE or the procedures for establishing the indicator range which provides a reasonable assurance of compliance:		
5b) PERFORMANCE CRITERIA Provide the SPECIFICATIONS FOR OBTAINING REPRESENTATIVE DATA, such as detector location, installation specifications, and minimum acceptable accuracy:		
[c] For new or modified monitoring equipment, provide VERIFICATION PROCEDURES, including manufacturer's recommendations, TO CONFIRM THE OPERATIONAL STATUS of the monitoring:		
Provide QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC) PRACTICES that are adequate to ensure the continuing validity of the data, (i.e., daily calibrations, visual inspections, routine maintenance, RATA, etc.):		
[d] Provide the MONITORING FREQUENCY:		
Provide the DATA COLLECTION PROCEDURES that will be used:		
Provide the DATA AVERAGING PERIOD for the purpose of determining whether an excursion or exceedance has occurred:		

[a] Describe all indicators to be monitored which satisfies 40 CFR §64.3(a). Indicators of emission control performance for the control device and associated capture system may include measured or predicted emissions (including visible emissions or opacity), process and control device operating parameters that affect control device (and capture system) efficiency or emission rates, or recorded findings of inspection and maintenance activities.

[b] Indicator Ranges may be based on a single maximum or minimum value or at multiple levels that are relevant to distinctly different operating conditions, expressed as a function of process variables, expressed as maintaining the applicable indicator in a particular operational status or designated condition, or established as interdependent between more than one indicator. For CEMS, COMS, or PEMS, include the most recent certification test for the monitor.

[c] The verification for operational status should include procedures for installation, calibration, and operation of the monitoring equipment, conducted in accordance with the manufacturer's recommendations, necessary to confirm the monitoring equipment is operational prior to the commencement of the required monitoring.

[d] Emission units with post-control PTE ≥ 100 percent of the amount classifying the source as a major source (i.e., Large PSEU) must collect four or more values per hour to be averaged. A reduced data collection frequency may be approved in limited circumstances. Other emission units must collect data at least once per 24 hour period.

RATIONALE AND JUSTIFICATION

Complete this section for **EACH** PSEU that needs to be addressed in this CAM plan submittal. This section may be copied as needed for each PSEU. This section is to be used to provide rationale and justification for the selection of EACH indicator and monitoring approach and EACH indicator range in order to meet the submittal requirements specified in 40 CFR §64.4.

6a) PSEU Designation:	6b) Regulated Air Pollutant:

7) **INDICATORS AND THE MONITORING APPROACH**: Provide the rationale and justification for the selection of the indicators and the monitoring approach used to measure the indicators. Also provide any data supporting the rationale and justification. Explain the reasons for any differences between the verification of operational status or the quality assurance and control practices proposed, and the manufacturer's recommendations. (If additional space is needed, attach and label accordingly with the appropriate PSEU designation and pollutant):

8) **INDICATOR RANGES**: Provide the rationale and justification for the selection of the indicator ranges. The rationale and justification shall indicate how **EACH** indicator range was selected by either a COMPLIANCE OR PERFORMANCE TEST, a TEST PLAN AND SCHEDULE, or by ENGINEERING ASSESSMENTS. Depending on which method is being used for each indicator range, include the specific information required below for that specific indicator range. (If additional space is needed, attach and label accordingly with the appropriate PSEU designation and pollutant):

- COMPLIANCE OR PERFORMANCE TEST (Indicator ranges determined from control device operating parameter data obtained during a compliance or performance test conducted under regulatory specified conditions or under conditions representative of maximum potential emissions under anticipated operating conditions. Such data may be supplemented by engineering assessments and manufacturer's recommendations). The rationale and justification shall INCLUDE a summary of the compliance or performance test results that were used to determine the indicator range, and documentation indicating that no changes have taken place that could result in a significant change in the control system performance or the selected indicator ranges since the compliance or performance test was conducted.

- TEST PLAN AND SCHEDULE (Indicator ranges will be determined from a proposed implementation plan and schedule for installing, testing, and performing any other appropriate activities prior to use of the monitoring). The rationale and justification shall INCLUDE the proposed implementation plan and schedule that will provide for use of the monitoring as expeditiously as practicable after approval of this CAM plan, except that in no case shall the schedule for completing installation and beginning operation of the monitoring exceed 180 days after approval.

- ENGINEERING ASSESSMENTS (Indicator Ranges or the procedures for establishing indicator ranges are determined from engineering assessments and other data, such as manufacturers' design criteria and historical monitoring data, because factors specific to the type of monitoring, control device, or PSEU make compliance or performance testing unnecessary). The rationale and justification shall INCLUDE documentation demonstrating that compliance testing is not required to establish the indicator range.

RATIONALE AND JUSTIFICATION:

Compliance Assurance Monitoring Review

I. CAM Submittal Requirements

Any "No" response indicates the CAM submittal does not meet the requirements of 40 CFR part 64.

64.4(a) Indicator Ranges, Designated Conditions, and Performance Criteria			
Does the submittal contain:	**Yes**	**No**	**NA**
1. **Indicators** that satisfy the design criteria at §§ 64.3(a)(1)-(2)?			
2. **Ranges** or designated conditions for the indicators, or the process by which such indicator ranges or designated conditions be established?			
3. **Performance criteria** that satisfy § 64.3(b)? *(see § 64.3(b) below)*			
4. **Indicator ranges** and **performance criteria** that will be used pursuant to § 64.3(d) for monitoring to be conducted by **CEMS, COMS or PEMS**? *(if applicable; see § 64.3(d) below)*			

64.3(b) Performance Design Criteria			
Does the submittal contain:	**Yes**	**No**	**NA**
5. Specifications that provide for obtaining **data representative** of the emissions or parameters being monitored (e.g., detector location, installation specifications)?			
6. **Quality assurance** and **quality control** practices that are adequate to ensure the continuing validity of the data?			
7. Specifications for the **frequency** of monitoring? *(see 11 and 12 below)*			
8. Specifications for the **data collection procedures** that will be used?			
9. For new or modified monitoring equipment, **verification procedures** to confirm the operational status of the monitoring? *(if applicable)*			
10. Specifications for the data **averaging period** for determining whether an excursion or exceedance has occurred? *(if applicable)*			
11. For **large PSEUs**, specifications for collecting **four or more data values per hour** (or a reduced data collection frequency approved pursuant to 64.3(b)(4)(ii)) on each parameter monitored and for averaging the values, as applicable, over the period determined pursuant to 64.3(b)(4)(i)? *(if applicable)*			
12. For **other than large PSEUs**, specifications for collecting one or more data values **at least once per day**? *(if applicable)*			

64.3(d) Special Criteria for CEMS/COMS/PEMS			
Does the submittal contain:	**Yes**	**No**	**NA**
13. The use of **CEMS, COMS, or PEMS** to satisfy part 64 requirements if such systems are already required under other authority of the Clean Air Act or state or local law? *(if applicable)*			
14. A requirement for **reporting exceedances** (or **excursions** if applicable to a COMS used to assure compliance with a particulate matter standard), consistent with any period for reporting of exceedances in an underlying requirement (or consistent with the averaging period established pursuant to 64.3(b)(4) if an underlying requirement does not contain a provision for establishing an averaging period)? *(if applicable)*			
15. For **COMS** used to assure compliance with a particulate matter standard, an **indicator range** consistent with paragraph 64.3(a)? *(if applicable)*			

64.4(b) Justification			
Does the submittal contain:	**Yes**	**No**	**NA**
16. **Justification** for the proposed elements of the monitoring?			
17. **All data** used to support the justification?			
18. **Explanation of any differences** from manufacturer recommendations for performance specifications proposed to satisfy § 64.3(b)(2) or (3)? *(if applicable)*			
19. Justification for the use of any "**presumptively acceptable monitoring**" approach? *(if applicable)*			

64.4(c) Existing Operating Parameter Data			
Does the submittal contain:	**Yes**	**No**	**NA**
20. Existing **operating parameter data** obtained during compliance or performance testing, a **test plan**, or **engineering assessment**? *(see 22 and 23 below)*			
21. **Documentation** that **no changes** to the PSEU, including the control device and capture system, have taken place since any performance or compliance tests were conducted? *(if applicable)*			

64.4(d) Test Plan and Schedule for Obtaining Data			
Does the submittal contain:	**Yes**	**No**	**NA**
22. If there are no existing test data, either: - a **test plan** and **schedule** for obtaining such data, or - indicator ranges (or procedures for establishing indicator ranges) that rely on **engineering assessments and other data**? *(if applicable)*			
23. If indicator ranges (or procedures for establishing indicator ranges) that rely on **engineering assessments and other data** are used (rather than test data or a test plan and schedule for obtaining data), a **demonstration** that factors specific to the type of monitoring, control device, or PSEU make compliance or performance testing unnecessary to establish indicator ranges? *(if applicable)*			

64.4(e) Plan and Schedule for Installation & Testing of Equipment			
Does the submittal contain:	**Yes**	**No**	**NA**
24. A **plan** and **schedule** for installing, testing and performing any other appropriate activities prior to use of the monitoring? *(if applicable)*			

II. CAM Permit Content Requirements

Any "No" response indicates the title V permit does not meet the requirements of 40 CFR part 64.

64.6(c) Minimum Requirements			
Does the permit specify:	**Yes**	**No**	**NA**
1. **Indicator(s)** to be monitored?			
2. **Means** or **device** to be used to measure the indicator(s)?			
3. **Performance requirements** established to satisfy § 64.3(b) or (d)?			
4. Means by which the owner or operator will **define** an **exceedance** or **excursion**?			
5. **Obligation** to conduct the monitoring and fulfill the other obligations specified in **§§ 64.7 through 64.9**?			
6. **Minimum data availability** requirement? *(if applicable)*			

64.6(d) Enforceable Schedule			
Does the permit specify:	**Yes**	**No**	**NA**
7. An **enforceable schedule** for any required installation, testing, or final verification of operational status? *(if applicable)*			

64.6(e) Submittal Disapproved by Permitting Authority			
Does the permit specify:	**Yes**	**No**	**NA**
8. At a minimum, monitoring that satisfies **§ 70.6(a)(3)(i)(B)** if the permitting authority disapproved the proposed monitoring? *(if applicable)*			
9. A **compliance schedule** for the source owner to submit an acceptable plan if the permitting authority disapproved the proposed monitoring? *(if applicable)*			

Tipane, Frederick <frederick.tipane@wv.gov>

Completeness Determination, EQM- Janus Compressor Station, Application No. R30-017-00158-2024

1 message

Tipane, Frederick <frederick.tipane@wv.gov> Mon, Mar 11, 2024 at 4:22 PM
To: Jack Mackin <jmackin@equitransmidstream.com>, "Kraus, Matthew" <MKraus@equitransmidstream.com>

Your Title V renewal application for a permit to operate the above referenced facility was received by this Division on March 6, 2024. After review of said application, it has been determined that the application is administratively complete as submitted. Therefore, the above referenced facility qualifies for an Application Shield.

The applicant has the duty to supplement or correct the application. Any applicant who fails to submit any relevant facts or who has submitted incorrect information in a permit application shall, upon becoming aware of such failure or incorrect submittal, promptly submit such supplementary facts or corrected information. In addition, an applicant shall provide additional information as necessary to address any requirements that become applicable to the source after the date it filed a complete application but prior to release of a draft permit.

The submittal of a complete application shall not affect the requirement that any source have all **preconstruction permits** required under the rules of the Division.

If during the processing of this application it is determined that additional information is necessary to evaluate or take final action on this application, a request for such information will be made in writing with a reasonable deadline for a response. Until which time as your renewal permit is issued or denied, please continue to operate this facility in accordance with 45CSR30, section 6.3.c. which states: *If the Secretary fails to take final action to deny or approve a timely and complete permit application before the end of the term of the previous permit, the permit shall not expire until the renewal permit has been issued or denied, and any permit shield granted for the permit shall continue in effect during that time.* This protection shall cease to apply if, subsequent to the completeness determination made pursuant to paragraph 6.1.d. of 45CSR30 and as required by paragraph 4.1.b., the applicant fails to submit by the deadline specified in writing any additional information identified as being needed to process the application.

Please remember, **failure of the applicant to timely submit information required or requested to process the application may cause the Application Shield to be revoked.** Should you have any questions regarding this determination, please contact me.

Sincerely,

Frederick Tipane

--

Frederick Tipane

Division of Air Quality

601 57th Street, SE

Charleston, WV 25304
(304) 414-1910
frederick.tipane@wv.gov

TITLE V PERMIT APPLICATION CHECKLIST
FOR ADMINISTRATIVE COMPLETENESS

EQM Gathering OPCP, LLC; Janus Compressor Station - Renewal R30-01700158-2024

A complete application is demonstrated when all the information required below is properly prepared, completed and attached. The items listed below are required information which must be submitted with a Title V permit application. Any submittal will be considered incomplete if the required information is not included.

☑	Application signed by a Responsible Official as defined in 45CSR§30-2.38 ("*Section 6: Certification of Information*" page signed and dated)
☑	Table of Contents (should be included, but not required for administrative completeness)
☑	Facility information
☑	Description of process and products, including NAICS and SIC codes, and including alternative operating scenarios
☑	Area map showing plant location
☑	Plot plan showing buildings and process areas
☑	Process flow diagram(s), showing all emission units, control equipment, emission points, and their relationships
☑	Identification of all applicable requirements with a description of the compliance status, the methods used for demonstrating compliance, and a Schedule of Compliance Form (ATTACHMENT F) for all requirements for which the source is not in compliance
☑	Listing of all active permits and consent orders (if applicable)
☑	Facility-wide emissions summary
☑	Identification of Insignificant Activities
☑	ATTACHMENT D - Title V Equipment Table completed for all emission units at the facility except those designated as insignificant activities
☑	ATTACHMENT E - Emission Unit Form completed for each emission unit listed in the Title V Equipment Table (ATTACHMENT D) and a Schedule of Compliance Form (ATTACHMENT F) for all requirements for which the emission unit is not in compliance
☑	ATTACHMENT G - Air Pollution Control Device Form completed for each control device listed in the Title V Equipment Table (ATTACHMENT D)
☐ NA	ATTACHMENT H – Compliance Assurance Monitoring (CAM) Plan Form completed for each control device for which the "Is the device subject to CAM?" question is answered "Yes" on the Air Pollution Control Device Form (ATTACHMENT G)
☐ NA	Confidential Information submitted in accordance with 45CSR31

WV DAQ Title V Permit Application Status for EQM Gathering OPCO, LLC ; Janus Compressor Station

4 messages

Mink, Stephanie R <stephanie.r.mink@wv.gov> Fri, Mar 8, 2024 at 9:56 AM
To: JMackin@equitransmidstream.com, mkraus@equitransmidstream.com, dmorris@cecinc.com
Cc: Carrie McCumbers <carrie.mccumbers@wv.gov>, "Tipane, Frederick" <frederick.tipane@wv.gov>

RE: Application Status

EQM Gathering OPCO, LLC

Janus Compressor Station

Facility ID No. 017-00158

Application No. R30-01700158-2024

Dear Mr. Mackin,

Your application for a Title V Permit Renewal for EQM Gathering OPCO, LLC's Janus Compressor Station was received by this Division on March 6, 2024, and was assigned to Frederick Tipane.

Should you have any questions, please contact the assigned permit writer, Frederick Tipane, at 304-926-0499, extension 41910, or Frederick.Tipane@wv.gov.

--

Stephanie Mink

Environmental Resources Associate

West Virginia Department of Environmental Protection

Division of Air Quality, Title V & NSR Permitting

601 57th Street SE

Charleston, WV 25304

Phone: 304-926-0499 x41281

Kraus, Matthew <MKraus@equitransmidstream.com> Fri, Mar 8, 2024 at 9:58 AM
To: "stephanie.r.mink@wv.gov" <stephanie.r.mink@wv.gov>

Your message

To: Kraus, Matthew
Subject: [EXTERNAL] WV DAQ Title V Permit Application Status for EQM Gathering OPCO, LLC ; Janus Compressor Station
Sent: Friday, March 8, 2024 9:56:57 AM (UTC-05:00) Eastern Time (US & Canada)

was read on Friday, March 8, 2024 9:58:24 AM (UTC-05:00) Eastern Time (US & Canada).

Tipane, Frederick <frederick.tipane@wv.gov> Mon, Mar 11, 2024 at 7:10 AM
To: stephanie.r.mink@wv.gov

Your message

To: Tipane, Frederick
Subject: WV DAQ Title V Permit Application Status for EQM Gathering OPCO, LLC ; Janus Compressor Station
Sent: 3/8/24, 9:56:57 AM EST

was read on 3/11/24, 7:10:29 AM EDT

McCumbers, Carrie <carrie.mccumbers@wv.gov> Mon, Mar 11, 2024 at 7:18 AM
To: stephanie.r.mink@wv.gov

Your message

To: McCumbers, Carrie
Subject: WV DAQ Title V Permit Application Status for EQM Gathering OPCO, LLC ; Janus Compressor Station
Sent: 3/8/24, 9:56:57 AM EST

was read on 3/11/24, 7:18:32 AM EDT

Mink, Stephanie R <stephanie.r.mink@wv.gov>

Automatic reply: WV DAQ Title V Permit Application Status for EQM Gathering OPCO, LLC ; Janus Compressor Station

1 message

Morris, Dave <dmorris@cecinc.com> Fri, Mar 8, 2024 at 9:57 AM
To: "Mink, Stephanie R" <stephanie.r.mink@wv.gov>

Hello,

I will be out of the office starting Wednesday March 6th through Friday the 8th. I will be responding to emails during this time. If this is an emergency please call my cell at 724-579-8860.

.

Received
March 6, 2024
WV DEP/Div of Air Quality

Division of Air Quality Permit Application Submittal

Please find attached a permit application for : EQM Gathering OPCO, LLC; Janus Compressor Station
[Company Name; Facility Location]

- DAQ Facility ID (for existing facilities only): 017-00158
- Current 45CSR13 and 45CSR30 (Title V) permits associated with this process (for existing facilities only): R30-01700158-2019

- Type of NSR Application (check all that apply):
  - ☐ Construction
  - ☐ Modification
  - ☐ Class I Administrative Update
  - ☐ Class II Administrative Update
  - ☐ Relocation
  - ☐ Temporary
  - ☐ Permit Determination

- Type of 45CSR30 (TITLE V) Application:
  - ☐ Title V Initial
  - ☑ Title V Renewal
  - ☐ Administrative Amendment**
  - ☐ Minor Modification**
  - ☐ Significant Modification**
  - ☐ Off Permit Change

****If the box above is checked, include the Title V revision information as ATTACHMENT S to the combined NSR/Title V application.**

- Payment Type:
  - ☑ Credit Card (Instructions to pay by credit card will be sent in the Application Status email.)
  - ☐ Check (Make checks payable to: WVDEP – Division of Air Quality)
    Mail checks to:
    WVDEP – DAQ – Permitting
    Attn: NSR Permitting Secretary
    601 57th Street, SE
    Charleston, WV 25304

Please wait until DAQ emails you the Facility ID Number and Permit Application Number. Please add these identifiers to your check or cover letter with your check.

- If the permit writer has any questions, please contact (all that apply):
  - ☑ Responsible Official/Authorized Representative
    - Name: Jack Mackin
    - Email: JMackin@equitransmidstream.com
    - Phone Number: 412-395-3576
  - ☑ Company Contact
    - Name: Matt Kraus
    - Email: mkraus@equitransmidstream.com
    - Phone Number: 412-260-1723
  - ☑ Consultant
    - Name: David Morris
    - Email: dmorris@cecinc.com
    - Phone Number: 412-275-2949

March 6, 2024

Laura M. Crowder, Director
West Virginia Department of Environmental Protection
Division of Air Quality
601 57th St. SE
Charleston, WV 25304

Subject: Title V Permit Renewal Application
EQM Gathering OPCO, LLC – Janus Compressor Station
Facility ID No: 017-00158
Title V Permit R30-01700158-2019
CEC Project 334-808

Dear Ms. Crowder:

EQM Gathering OPCO, LLC (EQM) is submitting this Title V permit renewal application for its Janus Compressor Station located in Doddridge County, West Virginia. The station is currently operating under permit R30-01700158-2019, issued September 17, 2019. The current permit expires on September 17, 2024 with a renewal application due date of March 17, 2024.

This permit application is being filed to renew the Title V permit at the Janus Compressor Station. The following Title V Application Forms and required supplemental documents in accordance with instructions for Title V permit application forms are enclosed as follows:

- Introduction
- Regulatory Discussion
- Title V Application Forms
- Attachment A: Area Map
- Attachment B: Plot Plan
- Attachment C: Process Flow Diagram
- Attachment D: Equipment Table
- Attachment E: Emission Unit Forms
- Attachment G: Air Pollution Control Device Forms
- Attachment H: Compliance Assurance Monitoring Plan
- Attachment I: Emission Calculations

Please contact this office or Mr. Matt Kraus of Equitrans at (412) 260-1723 if you have any questions regarding the application.

Sincerely,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

David Morris
Project Manager

Amanda Black
Vice President

Enclosures

cc: Matt Kraus, Equitrans Midstream

TITLE V PERMIT RENEWAL APPLICATION

JANUS COMPRESSOR STATION
DODDRIDGE COUNTY, WEST VIRGINIA

Submitted to:

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF AIR QUALITY
601 57TH STREET, SE
CHARLESTON, WV 25304

Prepared For:

EQM GATHERING OPCO, LLC
2200 ENERGY DRIVE,
CANONSBURG, PA 15317

Prepared By:

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
PITTSBURGH, PENNSYLVANIA

CEC Project 334-808

MARCH 2024

TITLE V PERMIT RENEWAL APPLICATION

EQM GATHERING OPCO, LLC
JANUS COMPRESSOR STATION
DODDRIDGE COUNTY, WEST VIRGINIA

TABLE OF CONTENTS

APPLICATION ATTACHMENTS:

INTRODUCTION

Process Description

EQM Gathering OPCO, LLC (EQM), a subsidiary of Equitrans Midstream operates the Janus Compressor Station (Janus) which is a natural gas gathering facility located in Doddridge County, West Virginia. Janus is currently operating under the Title V Operating Permit No. R30-01700158-2019 which was issued on September 17, 2019 and expires on September 17, 2024 with a renewal application due March 17, 2024. The Janus Compressor Station is a natural gas gathering facility which is covered by the Standard Industrial Classification (SIC) Code 1311. The station has the potential to operate a maximum of 24 hours per day, 7 days per week. Janus compresses and dehydrates natural gas and transports the gas downstream through a pipeline system.

The facility currently consists of the following equipment:

- Four (4) Caterpillar G3616 compressor engines, each rated at 5,000 hp and each equipped with an oxidation catalyst
- Two (2) glycol dehydration units with flash tanks, each rated at 152 MMSCFD and each equipped with one (1) enclosed flare, rated at 7 MMBtu/hr
- Two (2) glycol dehydration unit reboilers, each rated at 1.5 MMBtu/hr
- Two (2) produced fluids vessels, each with a capacity of 8,820 gallons and associated enclosed flare rated at 41 MMBtu/hr
- Liquid loading associated with the produced fluids vessels
- One (1) natural gas fired fuel gas heater, rated at 1.0 MMBtu/hr
- Two (2) natural gas fired suction condensate heaters, each rated at 0.006 MMBtu/hr
- Five (5) Capstone C200 microturbines, each rated at 0.2 MW
- One (1) engine lube oil tank, with a capacity of 2,000 gallons
- One (1) compressor lube oil tank, with a capacity of 2,000 gallons
- One (1) new MEG storage tank, with a capacity of 2,000 gallons
- One (1) used MEG storage tank, with a capacity of 2,000 gallons
- One (1) used oil storage tank, with a capacity of 4,200 gallons
- Four (4) engine lube oil storage tanks, each with a capacity of 302 gallons
- Four (4) compressor lube oil storage tanks, each with a capacity of 302 gallons
- One (1) new TEG storage tank, with a capacity of 2,000 gallons
- One (1) used TEG storage tank, with a capacity of 2,000 gallons
- Fugitive emissions from unpaved haul roads
- Fugitive emissions from equipment leaks, rod packing, pigging and intermittent bleed pneumatics
- Blowdown emissions from station ESD events, filter maintenance, and compressor blowdowns

The following sources were originally permitted but were not installed at the facility. They will remain in the permit in case they are installed in the future:

- One (1) natural gas fired fuel gas heater, rated at 0.75 MMBtu/hr

One (1) 2,000 gallon methanol tank was previously permitted for the facility. This tank was never installed and will not be installed at the facility, so it will no longer be included in the permit.

A process flow diagram has been provided as Attachment C to this application.

The Janus Compressor Station's site-wide potential to emit currently exceeds the Title V major source thresholds for nitrogen oxides (NOx) and volatile organic compounds (VOC). Emission calculations are provided as Attachment I to this application.

REGULATORY DISCUSSION

Regulatory Discussion

The regulatory discussion reviews the federal and West Virginia regulations applicable to the Janus Compressor Station facility. Only those regulations applicable to the facility have been included in the regulatory discussion.

1. TITLE V OPERATING PERMIT PROGRAM

Title 40 of the Code of Federal Regulations Part 70 (40 CFR 70) establishes the Title V Operating Permit Program. The Title V Operating Program has also been incorporated in West Virginia Code of State Regulations (CSR) 45-30. Under the West Virginia Title V Operating Permit Program, the major source thresholds are 10 tons per year (tpy) of a single hazardous air pollutant (HAP), 25 tpy of any combination of HAPs, and 100 tpy for all other regulated pollutants.

The following pollutants exceed the major source thresholds for the Janus Station:

- Nitrogen oxides (NOx), and volatile organic compounds (VOC) emissions exceed the threshold of 100 tpy for criteria pollutants.

2. COMPLIANCE ASSURANCE MONITORING

CAM applies to any unit with pre-controlled emissions greater than the Title V major source threshold level that utilizes a control device to comply with a federally enforceable requirement (e.g. emission limits). Its intent is "to provide reasonable assurance of compliance with applicable requirements under the Clean Air Act for emissions units that rely on pollution control devices to achieve compliance". The CAM rule requires owners and operators to maintain their control devices at levels that assure compliance, to design CAM plans around current requirements and operating practices, and to select representative parameters upon which compliance can be assured. The CAM plan establishes indicator ranges or procedures for setting indicator ranges, uses performance testing and other information to verify parameters and ranges, and seeks to correct control device performance problems as expeditiously as possible.

CAM potentially applies to every pollutant-specific emissions unit (PSEU) that is located at a major source where a 40 CFR Part 70 or 71 permit is required. The PSEU must be subject to an emission limitation or standard and use a control device to achieve compliance with an emission limitation or standard. A PSEU that is applicable to CAM shall have pre-control potential emissions that are equal or greater than 100 percent of the Title V major source threshold.

The CAM rule also contains several exemptions. Units that are subject to a NSPS or NESHAP regulation that was promulgated after November 15, 1990, are exempt from CAM. Units that have emissions limitations or standards for which a Title V permit specifies a continuous compliance determination method are also exempt. The two dehydration units at the Janus Compressor Station are not subject to CAM because they meet one or more of these exemptions.

Sections 2.1 and 2.2 provide information on the CAM applicability for specific units at the Janus Compressor Station. The emission units which warrant discussion are DEHY-001 and DEHY-002. The other emissions units at the facility are not subject to CAM requirements because they do not have control devices associated with their operation, or they do not have pre-control emissions greater than 100 percent of the Title V major source threshold.

2.1 DEHY-001 (FLARE-001)

In assessing CAM applicability, DEHY-001 has federally-enforceable emission limits associated with its operation. CAM applies to units that use control devices in order to comply with applicable standards for a regulated pollutant under Title V. Since the flare associated with DEHY-001 meets the definition of a control device per 40 CFR 64.1, this unit is potentially CAM applicable. The last variable to assess is whether the emission unit has potential pre-controlled emissions that are greater than the Title V major source threshold. Potential pre-controlled emissions from DEHY-001 exceed major source thresholds, so the unit is potentially CAM applicable.

DEHY-001 is subject to NESHAP Subpart HH, which is a NESHAP regulation promulgated after November 15, 1990, and therefore this unit is exempt from CAM according to 40 CFR 64.2(b)(1)(i). As such, CAM is not applicable to this emission unit and no CAM plan is required. Furthermore, Title V Operating Permit R30-01700158-2019 for the Janus Compressor Station specifies a continuous compliance determination for the flare applicable to DEHY-001. The continuous compliance determination specifies that the control device must maintain a specified control efficiency through operational procedures, including the operation and maintenance of a system that continuously measures the temperature of the combustion zone of each control device with a mechanism that prohibits the dehydrator from operating when the temperature in the combustion zone is below the minimum temperature. Based on these exemptions, CAM is not applicable to this emission unit and no CAM plan is required.

2.2 DEHY-002 (FLARE-002)

In assessing CAM applicability, DEHY-002 has federally-enforceable emission limits associated with its operation. CAM applies to units that use control devices in order to comply with applicable standards for a regulated pollutant under Title V. Since the flare associated with DEHY-002 meets the definition of a control device per 40 CFR 64.1, this unit is potentially CAM applicable. The last variable to assess is whether the emission unit has potential pre-controlled emissions that are greater than the Title V major source threshold. Potential pre-controlled emissions from DEHY-001 exceed major source thresholds, so the unit is potentially CAM applicable.

DEHY-002 is subject to NESHAP Subpart HH, which is a NESHAP regulation promulgated after November 15, 1990, and is therefore exempt from this unit from CAM according to 40 CFR 64.2(b)(1)(i). As such, CAM is not applicable to this emission unit and no CAM plan is required. Furthermore, Title V Operating Permit R30-01700158-2019 for the Janus Compressor Station specifies a continuous compliance determination for the flare applicable to DEHY-002. The

continuous compliance determination specifies that the control device must maintain a specified control efficiency through operational procedures, including the operation and maintenance of a system that continuously measures the temperature of the combustion zone of each control device with a mechanism that prohibits the dehydrator from operating when the temperature in the combustion zone is below the minimum temperature. Based on these exemptions, CAM is not applicable to this emission unit and no CAM plan is required.

2.3 PRODUCED FLUIDS TANKS (FLARE-003)

In assessing CAM applicability, the produced fluids tanks T-001 and T-002 have federally-enforceable emission limits associated with their operation. CAM applies to units that use control devices in order to comply with applicable standards for a regulated pollutant under Title V. Since the flare associated with produced fluids tanks T-001 and T-002 meets the definition of a control device per 40 CFR 64.1, this unit is potentially CAM applicable. The last variable to assess is whether the emission unit has potential pre-controlled emissions that are greater than the Title V major source threshold. Potential pre-controlled emissions from produced fluids tanks T-001 and T-002 do not exceed major source thresholds, so the unit is not CAM applicable and no CAM plan is required.

3. 40 CFR 60 NEW SOURCE PERFORMANCE STANDARDS (NSPS) SUBPART OOOO

NSPS Subparts OOOO Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution, (OOOO) applies to affected facilities that commenced construction, reconstruction, or modification after August 23, 2011 and before September 18, 2015 for OOOO. All sources at Janus Compressor Station were constructed after September 18, 2015, therefore Janus is not a OOOO affected facility.

3.1 40 CFR 60 NEW SOURCE PERFORMANCE STANDARDS (NSPS) SUBPART OOOOA

NSPS Subpart OOOOa– Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution,(OOOOa) applies to affected facilities that commenced construction, reconstruction, or modification after September 18, 2015. The Produced Fluids Tanks were installed in 2016. The potential Volatile Organic Compound emissions for each tank are below the 6 tons per year threshold, therefore Janus is not a storage vessel affected facility.

All compressor engines were installed after September 18, 2015, therefore Janus is a reciprocating compressor affected facility under OOOOa. The reciprocating compressors at the facility must change the rod packing prior to operating 26,000 hours or prior to 36 months of the last packing change (or start up). EQM will continue to comply with the requirements of this rule.

The collection of fugitive components at the compressor station is an affected facility (subject to leak detection and repair or 'LDAR') based on the date it commenced construction. Therefore, EQM will be required to monitor all fugitive emission components as defined in OOOOa with an approved methodology, and repair all sources of fugitive emissions in accordance with the rule. EQM must also develop a monitoring plan, and conduct surveys on a quarterly basis. EQM is also subject to the applicable recordkeeping and reporting requirements of the rule. EQM will continue to comply with requirements of this rule.

4. NSPS SUBPART JJJJ – STATIONARY SPARK IGNITION INTERNAL COMBUSTION ENGINES

NSPS 40 CFR Part 60 Subpart JJJJ (NSPS JJJJ) affects owners and operators of stationary spark ignition internal combustion engines (SI ICE) that commence construction, reconstruction, or modification after June 12, 2006. Applicability dates are based on the manufacture date for new engines. The applicability dates for new engines range from July 1, 2007 to January 1, 2019, depending upon the engine horsepower and application. The engines at the Janus Compressor Station are 4-stroke, lean burn spark ignition RICE (each rated at >500 hp) manufactured after July 1, 2007. The engines are equipped with oxidation catalysts to reduce CO, formaldehyde, and VOC emissions. The engines are subject to the emission standards per Table 1 of NSPS JJJJ non-emergency use engines and will be in compliance with the NSPS JJJJ limits.

EQM will continue to demonstrate compliance with this subpart for all non-certified engines at the Janus Compressor Station in accordance with 40 CFR §60.4243(b)(2)(ii) which requires EQM to keep a maintenance plan and records of conducted maintenance and to maintain and operate engines, to the extent practicable, in a manner consistent with good air pollution control practices for minimizing emissions. Additionally, EQM is required to conduct compliance testing every 8,760 hours or three years, whichever comes first, to demonstrate continued compliance. Testing will be conducted in accordance with 40 CFR §60.4244.

Records of all notifications submitted to comply with this subpart, maintenance conducted on the engines, and performance testing will be maintained in accordance with 40 CFR §60.4245(a). Performance testing results will be reported as required in 40 CFR §60.4245(d).

5. NATIONAL EMISSIONS STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAP)

40 CFR 63 includes regulatory requirements for facilities which are subject to NESHAP standards, known as Maximum Available Control Technology (MACT) Standards. A major source of HAP emissions is defined as having potential emissions exceeding 25 tpy for total HAP and/or potential emissions exceeding 10 tpy for any individual HAP. Part 63 of NESHAPs apply to sources in specifically regulated industrial source categories (CAA Section 112(d)) or on a case-by-case basis (Section 112(g)) for facilities not regulated as a specific industrial source type.

The Janus Compressor Station is an area source of HAP emissions since its potential emission of any single HAP does not exceed the 10 tpy threshold, and the total HAP emissions does not exceed the 25 tpy threshold. The potential applicability of specific MACT standards to the Janus Station is discussed below.

6. NESHAP SUBPART HH – OIL AND NATURAL GAS PRODUCTION FACILITIES

This MACT standard contains requirements for both major and area sources of HAP. Dehy Units #1 and #2 (DEHY-001 and DEHY-002) at the Janus Compressor Station can process field gas from production gathering lines entering the site and the facility is considered an area source of HAP as defined by 40 CFR §63.761. Therefore, Dehy Units #1 and #2 are subject to the requirements for area sources under Subpart HH when processing production field gas.

The benzene emissions from Dehy Unit #1 and Dehy #2 are less than 0.90 megagrams per year (1 tpy), therefore, the Janus Compressor Station is exempt from the requirements of NESHAP Subpart HH pursuant to 40 CFR §63.764(e)(l)(ii), except for the requirement to keep records of the actual average natural gas flow rate or actual average benzene emissions from the dehydrator, per 40 CFR §63.774(d)(1). EQM will continue to comply with the requirements of Subpart HH as outlined in the current permit.

7. NESHAP SUBPART HHH – NATURAL GAS TRANSMISSION AND STORAGE FACILITIES

This standard applies to such units at natural gas transmission and storage facilities that are major sources of HAP emissions located downstream of the point of custody transfer (after processing and/or treatment in the production sector), but upstream of the distribution sector. Subpart HHH defines a "major source" as having the same meaning as in section 63.2, except that: (1) Emissions from any pipeline compressor station or pump station shall not be aggregated with emissions from other similar units, whether or not such units are in a contiguous area or under common control; and (2) Emissions from process, operations, and equipment that are not part of the same facility, as defined in this section, shall not be aggregated.

The Janus Compressor Station is a gathering station and is not a transmission or storage facility. As such, the requirements of this subpart do not apply to the station.

8. NESHAP SUBPART ZZZZ – STATIONARY RECIPROCATING INTERNAL COMBUSTION ENGINES

This MACT subpart applies to stationary reciprocating combustion engines (RICE) at major and area sources of HAP. The Caterpillar G3616 compressor engines at the Janus Compressor Station are classified as existing spark ignition engines at an area (minor) source of HAP. 40 CFR §63.6590(c) states that a new or reconstructed stationary reciprocating internal combustion engine (RICE) located at an area source of HAP must meet the requirements of NESHAP Subpart ZZZZ by meeting the requirements of NSPS Subpart JJJJ. No further requirements apply for such engines

under NESHAP Subpart ZZZZ. EQM will be in compliance with applicable requirements of 40 CFR 63 Subpart ZZZZ by meeting the applicable requirements of 40 CFR 60 JJJJ.

9. 45 CSR 2: TO PREVENT AND CONTROL PARTICULATE AIR POLLUTION FROM COMBUSTION OF FUEL IN INDIRECT HEAT EXCHANGERS

45 CSR 2 applies to fuel burning units, defined as equipment burning fuel "for the purpose of producing heat or power by indirect heat transfer". The reboilers and fuel gas heaters are fuel burning units and therefore must comply with this regulation. Per 45 CSR 2-3, opacity of emissions from units shall not exceed 10 percent, based on a six-minute block average. Per 45 CSR 2-4, PM emissions from the units will not exceed a level measured in lb/hr of 0.09 multiplied by the heat design inputs in MMBtu/hr.

10. 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.

11. 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 purpose 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 Dehydrator Enclosed Flares and the Produced Fluids Tanks Enclosed Flare are incinerators and therefore must comply with this regulation. Per 45 CSR 6-4.3, opacity of emissions from these units 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.

12. 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 CSR Part 60 by reference. As such, by complying with all applicable requirements of 40 CFR Part 60 at the Janus Compressor Station, EQM will be complying with 45 CSR 16.

13. 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 process at Janus Compressor Station, it is unlikely that fugitive particulate matter emissions will be emitted under normal operating conditions. However, EQM will take measures to ensure that any fugitive particulate matter emissions will not cross the property boundary should any emissions occur.

14. 45 CSR 34: EMISSIONS STANDARDS FOR HAZARDOUS AIR POLLUTANTS

45 CSR 34-1 incorporates the federal Clean Air Act (CAA) national emissions standards for hazardous air pollutants (NESHAPs) as set forth in 40 CFR Parts 61 and 63 by reference. As such, by complying with all applicable requirements of 40 CFR Parts 61 and 63 at Janus Compressor Station, EQM will be complying with 45 CSR 34.

TITLE V APPLICATION FORMS

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF AIR QUALITY

601 57th Street SE

Charleston, WV 25304

Phone: (304) 926-0475

www.dep.wv.gov/daq

INITIAL/RENEWAL TITLE V PERMIT APPLICATION - GENERAL FORMS

Section 1: General Information

1. **Name of Applicant (As registered with the WV Secretary of State's Office):** EQM Gathering OPCO, LLC	**2. Facility Name or Location:** Janus Compressor Station
3. DAQ Plant ID No.: 017-00158	**4. Federal Employer ID No. (FEIN):** 32-0422322

5. **Permit Application Type:**

☐ Initial Permit — When did operations commence?

☑ Permit Renewal — What is the expiration date of the existing permit? September 17, 2024

☐ Update to Initial/Renewal Permit Application

6. Type of Business Entity:

☐ Corporation ☐ Governmental Agency ☑ LLC
☐ Partnership ☐ Limited Partnership

7. Is the Applicant the:

☐ Owner ☐ Operator ☑ Both

If the Applicant is not both the owner and operator, please provide the name and address of the other party.

8. Number of onsite employees:

0

9. Governmental Code:

☑ Privately owned and operated; 0
☐ Federally owned and operated; 1
☐ State government owned and operated; 2
☐ County government owned and operated; 3
☐ Municipality government owned and operated; 4
☐ District government owned and operated; 5

10. 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.

11. Mailing Address		
Street or P.O. Box: 2200 Energy Drive		
City: Canonsburg	**State:** PA	**Zip:** 15317
Telephone Number:	**Fax Number:**	

12. Facility Location (Physical Address)		
Street: Left Fork Run Road	**City:** West Union	**County:** Doddridge
UTM Easting: 516.776 km	**UTM Northing:** 4,345.401 km	**Zone:** ☑ 17 or ☐ 18
Directions: Turn south off of RT 50 at mile marker 50.5 onto Arnolds Creek Rd. (Rt. 11). In 0.7 miles, continue straight onto Left Fork Run Rd. In 1.1 miles, the access road for the facility will be on the right.		
Portable Source? ☐ Yes ☑ No		
Is facility located within a nonattainment area? ☐ Yes ☑ No		**If yes, for what air pollutants?**
Is facility located within 50 miles of another state? ☑ Yes ☐ No		**If yes, name the affected state(s).** Ohio Pennsylvania
Is facility located within 100 km of a Class I Area[1]? ☐ Yes ☑ No **If no, do emissions impact a Class I Area[1]?** ☐ Yes ☑ No		**If yes, name the area(s).**

[1] *Class I areas include Dolly Sods and Otter Creek Wilderness Areas in West Virginia, and Shenandoah National Park and James River Face Wilderness Area in Virginia.*

13. Contact Information		
Responsible Official: Jack Mackin		**Title:** Vice President, Operations
Street or P.O. Box: 2200 Energy Drive		
City: Canonsburg	**State:** PA	**Zip:** 15317
Telephone Number: 412-395-3576	**Cell Number:**	
E-mail address: jmackin@equitransmidstream.com		
Environmental Contact: Matt Kraus		**Title:** Environmental Engineer
Street or P.O. Box: 2200 Energy Drive		
City: Canonsburg	**State:** PA	**Zip:** 15317
Telephone Number:	**Cell Number:** 412-260-1723	
E-mail address: mkraus@equitransmidstream.com		
Application Preparer: David Morris		**Title:** Project Manager
Company: Civil & Environmental Consultants, Inc		
Street or P.O. Box: 700 Cherrington Parkway		
City: Moon Township	**State:** PA	**Zip:** 15108
Telephone Number: 412-429-2324	**Cell Number:** 724-579-8860	
E-mail address: dmorris@cecinc.com		

14. Facility Description

List all processes, products, NAICS and SIC codes for normal operation, in order of priority. Also list any process, products, NAICS and SIC codes associated with any alternative operating scenarios if different from those listed for normal operation.

Process	Products	NAICS	SIC
Natural Gas Gathering Facility	Natural Gas	211111	1311

Provide a general description of operations.

The Janus Compressor Station is an existing natural gas gathering facility. Natural gas and liquids (mostly produced water) from nearby wells undergo compression and dehydration before it is transported to a gas gathering line.

15. Provide an **Area Map** showing plant location as **ATTACHMENT A**.

16. Provide a **Plot Plan(s)**, e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is located as **ATTACHMENT B**. For instructions, refer to "Plot Plan - Guidelines."

17. Provide a detailed **Process Flow Diagram(s)** showing each process or emissions unit as **ATTACHMENT C**. Process Flow Diagrams should show all emission units, control equipment, emission points, and their relationships.

Section 2: Applicable Requirements

18. Applicable Requirements Summary	
Instructions: Mark all applicable requirements.	
☑ SIP	☐ FIP
☑ Minor source NSR (45CSR13)	☐ PSD (45CSR14)
☑ NESHAP (45CSR34)	☐ Nonattainment NSR (45CSR19)
☑ Section 111 NSPS	☑ Section 112(d) MACT standards
☐ Section 112(g) Case-by-case MACT	☐ 112(r) RMP
☐ Section 112(i) Early reduction of HAP	☐ Consumer/commercial prod. reqts., section 183(e)
☐ Section 129 Standards/Reqts.	☐ Stratospheric ozone (Title VI)
☐ Tank vessel reqt., section 183(f)	☐ Emissions cap 45CSR§30-2.6.1
☐ NAAQS, increments or visibility (temp. sources)	☐ 45CSR27 State enforceable only rule
☐ 45CSR4 State enforceable only rule	☐ Acid Rain (Title IV, 45CSR33)
☐ Emissions Trading and Banking (45CSR28)	☐ **C**ompliance **A**ssurance **M**onitoring (40CFR64)
☐ Cross-State Air Pollution Rule (45CSR43)	

19. Non Applicability Determinations

List all requirements which the source has determined not applicable and for which a permit shield is requested. The listing shall also include the rule citation and the reason why the shield applies.

- 40 CFR part 60 Dc - the boilers at the facility are below 10 MMBtu/hr
- 40 CFR part 60 Subpart GG and KKKK - there are no turbines greater than 10 MMBtu/hr at the facility
- 40 CFR part 60 Subparts K, Ka - all tanks at the facility are less than 40,000 gallons in capacity
- 40 CFR part 60 Subpart KKK - the facility is not engaged in the extraction of natural gas liquids from field gas or in the fractionation of mixed natural gas liquids to natural gas products
- 40 CFR part 60 Subpart LLL - there are no sweetening units at the facility
- 40 CFR part 60 Subpart IIII - the engines at the facility are not stationary compression ignition (CI) internal combustion engines (ICE)
- 40 CFR part 60 Subpart OOOO - this subpart applies to affected facilities that have been constructed, reconstructed, or modified after August 23, 2011 and on or before September 18, 2015. All emission units at the facility were constructed in 2016 and have not been modified or reconstructed, and therefore the requirements of this subpart do not apply
- 40 CFR part 60 Subpart DDDDD - this MACT standard applies to industrial, commercial, and institutional boilers and process heaters of various sizes and fuel types at major sources of HAP emissions. The facility is an area source of HAP emissions. Therefore, this subpart is not applicable
- 40 CFR part 63 Subpart JJJJJJ - this MACT standard applies to industrial, commercial, and institutional boilers at area sources of HAP. All boilers at the facility fire natural gas exclusively. Natural gas fired boilers are exempt from the rule per 40 C.F.R. §63.1195 (e). Therefore, this rule is not applicable
- 45 CSR 21 - the facility is not located in Cabell, Kanawha, Putnam, Wayne, nor Wood counties.
- 45 CSR 27 - natural gas is included as a petroleum product and contains less than 5% benzene by weight.
- 45 CSR §27-2.4 - exempts equipment "used in the production and distribution of petroleum products providing that such equipment does not produce or contact materials containing more than 5% benzene by weight"

☑ Permit Shield

19. Non Applicability Determinations *(Continued)* - *Attach additional pages as necessary.*

List all requirements which the source has determined not applicable and for which a permit shield is requested. The listing shall also include the rule citation and the reason why the shield applies.

☑ Permit Shield

20. Facility-Wide Applicable Requirements

List all facility-wide applicable requirements. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*).

45CSR§6-3.1 Open Burning, R13 Permit Condition 3.1.1
45CSR§6-3.2 Open Burning Exemptions R13 Permit Condition 3.1.2
45CSR§61.145(b) and 45CSR§34 Asbestos, R13 Permit Condition 3.1.3
45CSR§4-3.1 Odor, R13 Permit Condition 3.1.4
45CSR§13-10.5 Permanent Shutdown, R13 Permit Condition 3.1.5
45CSR§11-5.2 Standby Plan for Reducing Emissions, R13 Permit Condition 3.1.6
45CSR§17-3-1 Particulate Matter Emissions

☑ Permit Shield

For all facility-wide applicable requirements listed above, provide monitoring/testing / recordkeeping / reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number and/or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

WV Code §22-5-4(a)(14-15) and 45CSR13 Stack Testing, R13 Permit Condition 3.3
Retention of Records, R13 Permit Condition 3.4.1.
45CSR§4 Odors, R13 Permit Condition 3.4.2.
Reporting Requirements, R13 Permit Condition 3.5.

Are you in compliance with all facility-wide applicable requirements? ☑ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

20. Facility-Wide Applicable Requirements *(Continued)* - *Attach additional pages as necessary.*

List all facility-wide applicable requirements. For each applicable requirement, include the rule citation and/or permit with the condition number.

☐ Permit Shield

For all facility-wide applicable requirements listed above, provide monitoring/testing/recordkeeping/ reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number and/or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Are you in compliance with all facility-wide applicable requirements? ☐ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

21. Active Permits/Consent Orders		
Permit or Consent Order Number	Date of Issuance MM/DD/YYYY	List any Permit Determinations that Affect the Permit *(if any)*
R30-01700158-2019	09/17/2019	NA
R13-3269B	8/21/2018	NA

22. Inactive Permits/Obsolete Permit Conditions		
Permit Number	Date of Issuance MM/DD/YYYY	Permit Condition Number
R13-3269A	1/18/2017	NA
R13-3269	02/12/2016	NA

Section 3: Facility-Wide Emissions

23. Facility-Wide Emissions Summary [Tons per Year]	
Criteria Pollutants	Potential Emissions
Carbon Monoxide (CO)	56.29
Nitrogen Oxides (NO_X)	119.84
Lead (Pb)	<0.01
Particulate Matter ($PM_{2.5}$)[1]	8.45
Particulate Matter (PM_{10})[1]	8.69
Total Particulate Matter (TSP)	12.38
Sulfur Dioxide (SO_2)	0.67
Volatile Organic Compounds (VOC)	114.95
Hazardous Air Pollutants[2]	Potential Emissions
Formaldehyde (HCHO)	3.91
Total HAPs	20.77
Regulated Pollutants other than Criteria and HAP	Potential Emissions

[1]$PM_{2.5}$ and PM_{10} are components of TSP.
[2]For HAPs that are also considered PM or VOCs, emissions should be included in both the HAPs section and the Criteria Pollutants section.

Section 4: Insignificant Activities

24. Insignificant Activities (Check all that apply)		
☑	1.	Air compressors and pneumatically operated equipment, including hand tools.
☐	2.	Air contaminant detectors or recorders, combustion controllers or shutoffs.
☑	3.	Any consumer product used in the same manner as in normal consumer use, provided the use results in a duration and frequency of exposure which are not greater than those experienced by consumer, and which may include, but not be limited to, personal use items; janitorial cleaning supplies, office supplies and supplies to maintain copying equipment.
☑	4.	Bathroom/toilet vent emissions.
☑	5.	Batteries and battery charging stations, except at battery manufacturing plants.
☐	6.	Bench-scale laboratory equipment used for physical or chemical analysis, but not lab fume hoods or vents. Many lab fume hoods or vents might qualify for treatment as insignificant (depending on the applicable SIP) or be grouped together for purposes of description.
☐	7.	Blacksmith forges.
☑	8.	Boiler water treatment operations, not including cooling towers.
☑	9.	Brazing, soldering or welding equipment used as an auxiliary to the principal equipment at the source.
☐	10.	CO_2 lasers, used only on metals and other materials which do not emit HAP in the process.
☑	11.	Combustion emissions from propulsion of mobile sources, except for vessel emissions from Outer Continental Shelf sources.
☑	12.	Combustion units designed and used exclusively for comfort heating that use liquid petroleum gas or natural gas as fuel.
☑	13.	Comfort air conditioning or ventilation systems not used to remove air contaminants generated by or released from specific units of equipment.
☐	14.	Demineralized water tanks and demineralizer vents.
☐	15.	Drop hammers or hydraulic presses for forging or metalworking.
☐	16.	Electric or steam-heated drying ovens and autoclaves, but not the emissions from the articles or substances being processed in the ovens or autoclaves or the boilers delivering the steam.
☐	17.	Emergency (backup) electrical generators at residential locations.
☐	18.	Emergency road flares.
☑	19.	Emission units which do not have any applicable requirements and which emit criteria pollutants (CO, NO_x, SO_2, VOC and PM) into the atmosphere at a rate of less than 1 pound per hour and less than 10,000 pounds per year aggregate total for each criteria pollutant from all emission units. Please specify all emission units for which this exemption applies along with the quantity of criteria pollutants emitted on an hourly and annual basis: Four (4) Engine Lube Oil Tanks (each rated at 300 gallons) Four (4) Compressor Lube Oil Tanks (each rated at 300 gallons) One (1) 2,000 gallon New TEG Tank One (1) 2,000 gallon Used TEG Tank One (1) 2,000 gallon Engine Lube Oil Tank One (1) 2,000 gallon Compressor Lube Oil Tank One (1) 2,000 gallon New MEG Storage Tank One (1) 2,000 gallon Used MEG Storage Tank One (1) 4,200 gallon Used Oil Storage Tank

24. Insignificant Activities (Check all that apply)		
☐	20.	Emission units which do not have any applicable requirements and which emit hazardous air pollutants into the atmosphere at a rate of less than 0.1 pounds per hour and less than 1,000 pounds per year aggregate total for all HAPs from all emission sources. This limitation cannot be used for any source which emits dioxin/furans nor for toxic air pollutants as per 45CSR27. Please specify all emission units for which this exemption applies along with the quantity of hazardous air pollutants emitted on an hourly and annual basis:
☐	21.	Environmental chambers not using hazardous air pollutant (HAP) gases.
☐	22.	Equipment on the premises of industrial and manufacturing operations used solely for the purpose of preparing food for human consumption.
☐	23.	Equipment used exclusively to slaughter animals, but not including other equipment at slaughterhouses, such as rendering cookers, boilers, heating plants, incinerators, and electrical power generating equipment.
☑	24.	Equipment used for quality control/assurance or inspection purposes, including sampling equipment used to withdraw materials for analysis.
☐	25.	Equipment used for surface coating, painting, dipping or spray operations, except those that will emit VOC or HAP.
☑	26.	Fire suppression systems.
☐	27.	Firefighting equipment and the equipment used to train firefighters.
☐	28.	Flares used solely to indicate danger to the public.
☑	29.	Fugitive emission related to movement of passenger vehicle provided the emissions are not counted for applicability purposes and any required fugitive dust control plan or its equivalent is submitted.
☐	30.	Hand-held applicator equipment for hot melt adhesives with no VOC in the adhesive formulation.
☑	31.	Hand-held equipment for buffing, polishing, cutting, drilling, sawing, grinding, turning or machining wood, metal or plastic.
☐	32.	Humidity chambers.
☐	33.	Hydraulic and hydrostatic testing equipment.
☐	34.	Indoor or outdoor kerosene heaters.
☑	35.	Internal combustion engines used for landscaping purposes.
☐	36.	Laser trimmers using dust collection to prevent fugitive emissions.
☐	37.	Laundry activities, except for dry-cleaning and steam boilers.
☑	38.	Natural gas pressure regulator vents, excluding venting at oil and gas production facilities.
☐	39.	Oxygen scavenging (de-aeration) of water.
☐	40.	Ozone generators.

24. Insignificant Activities (Check all that apply)		
☑	41.	Plant maintenance and upkeep activities (e.g., grounds-keeping, general repairs, cleaning, painting, welding, plumbing, re-tarring roofs, installing insulation, and paving parking lots) provided these activities are not conducted as part of a manufacturing process, are not related to the source's primary business activity, and not otherwise triggering a permit modification. (Cleaning and painting activities qualify if they are not subject to VOC or HAP control requirements. Asphalt batch plant owners/operators must still get a permit if otherwise requested.)
☑	42.	Portable electrical generators that can be moved by hand from one location to another. "Moved by Hand" means that it can be moved without the assistance of any motorized or non-motorized vehicle, conveyance, or device.
☐	43.	Process water filtration systems and demineralizers.
☑	44.	Repair or maintenance shop activities not related to the source's primary business activity, not including emissions from surface coating or de-greasing (solvent metal cleaning) activities, and not otherwise triggering a permit modification.
☑	45.	Repairs or maintenance where no structural repairs are made and where no new air pollutant emitting facilities are installed or modified.
☑	46.	Routing calibration and maintenance of laboratory equipment or other analytical instruments.
☐	47.	Salt baths using nonvolatile salts that do not result in emissions of any regulated air pollutants. Shock chambers.
☐	48.	Shock chambers.
☐	49.	Solar simulators.
☐	50.	Space heaters operating by direct heat transfer.
☐	51.	Steam cleaning operations.
☐	52.	Steam leaks.
☐	53.	Steam sterilizers.
☐	54.	Steam vents and safety relief valves.
☐	55.	Storage tanks, reservoirs, and pumping and handling equipment of any size containing soaps, vegetable oil, grease, animal fat, and nonvolatile aqueous salt solutions, provided appropriate lids and covers are utilized.
☑	56.	Storage tanks, vessels, and containers holding or storing liquid substances that will not emit any VOC or HAP. Exemptions for storage tanks containing petroleum liquids or other volatile organic liquids should be based on size limits such as storage tank capacity and vapor pressure of liquids stored and are not appropriate for this list.
☐	57.	Such other sources or activities as the Director may determine.
☐	58.	Tobacco smoking rooms and areas.
☑	59.	Vents from continuous emissions monitors and other analyzers.

Section 5: Emission Units, Control Devices, and Emission Points

25. Equipment Table

Fill out the **Title V Equipment Table** and provide it as **ATTACHMENT D**.

26. Emission Units

For each emission unit listed in the **Title V Equipment Table**, fill out and provide an **Emission Unit Form** as **ATTACHMENT E**.

For each emission unit not in compliance with an applicable requirement, fill out a **Schedule of Compliance Form** as **ATTACHMENT F**.

27. Control Devices

For each control device listed in the **Title V Equipment Table**, fill out and provide an **Air Pollution Control Device Form** as **ATTACHMENT G**.

For any control device that is required on an emission unit in order to meet a standard or limitation for which the potential pre-control device emissions of an applicable regulated air pollutant is greater than or equal to the Title V Major Source Threshold Level, refer to the **Compliance Assurance Monitoring (CAM) Form(s)** for CAM applicability. Fill out and provide these forms, if applicable, for each Pollutant Specific Emission Unit (PSEU) as **ATTACHMENT H**.

Section 6: Certification of Information

28. Certification of Truth, Accuracy and Completeness and Certification of Compliance

Note: This Certification must be signed by a responsible official as defined in 45CSR§30-2.38.

a. Certification of Truth, Accuracy and Completeness

I certify that I am a responsible official (as defined at 45CSR§30-2.38) and am accordingly authorized to make this submission on behalf of the owners or operators of the source described in this document and its attachments. I certify under penalty of law that I have personally examined and am familiar with the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine and/or imprisonment.

b. 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.

Responsible official (type or print)

Name:	Title:
Jack Mackin	Vice President, Operations

Responsible official's signature:

Signature: _____ Signature Date: 2-29-2024

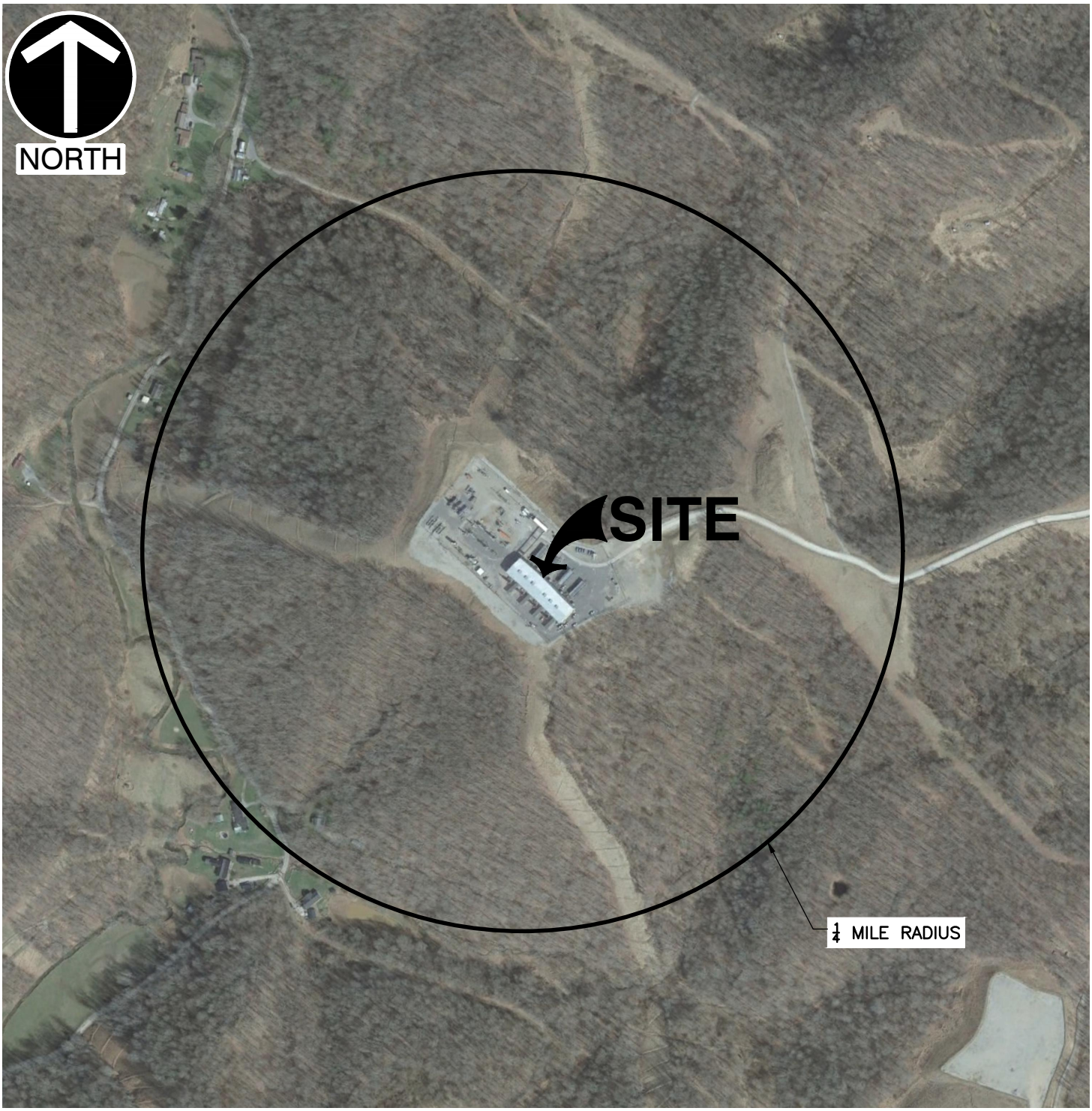
(Must be signed and dated in blue ink or have a valid electronic signature)

Note: Please check all applicable attachments included with this permit application:

- [x] ATTACHMENT A: Area Map
- [x] ATTACHMENT B: Plot Plan(s)
- [x] ATTACHMENT C: Process Flow Diagram(s)
- [x] ATTACHMENT D: Equipment Table
- [x] ATTACHMENT E: Emission Unit Form(s)
- [ ] ATTACHMENT F: Schedule of Compliance Form(s)
- [x] ATTACHMENT G: Air Pollution Control Device Form(s)
- [x] ATTACHMENT H: Compliance Assurance Monitoring (CAM) Form(s)

All of the required forms and additional information can be found and downloaded from, the DEP website at www.dep.wv.gov/daq, requested by phone (304) 926-0475, and/or obtained through the mail.

ATTACHMENT A
AREA MAP



REFERENCE

AERIAL TAKEN FROM GOOGLE EARTH PRO, DATED: MARCH 21, 2021.

SCALE IN FEET

0 500 1000

*HAND SIGNATURE ON FILE

Civil & Environmental Consultants, Inc.
700 Cherrington Parkway · Moon Township, PA 15108
412-429-2324 · 800-365-2324
www.cecinc.com

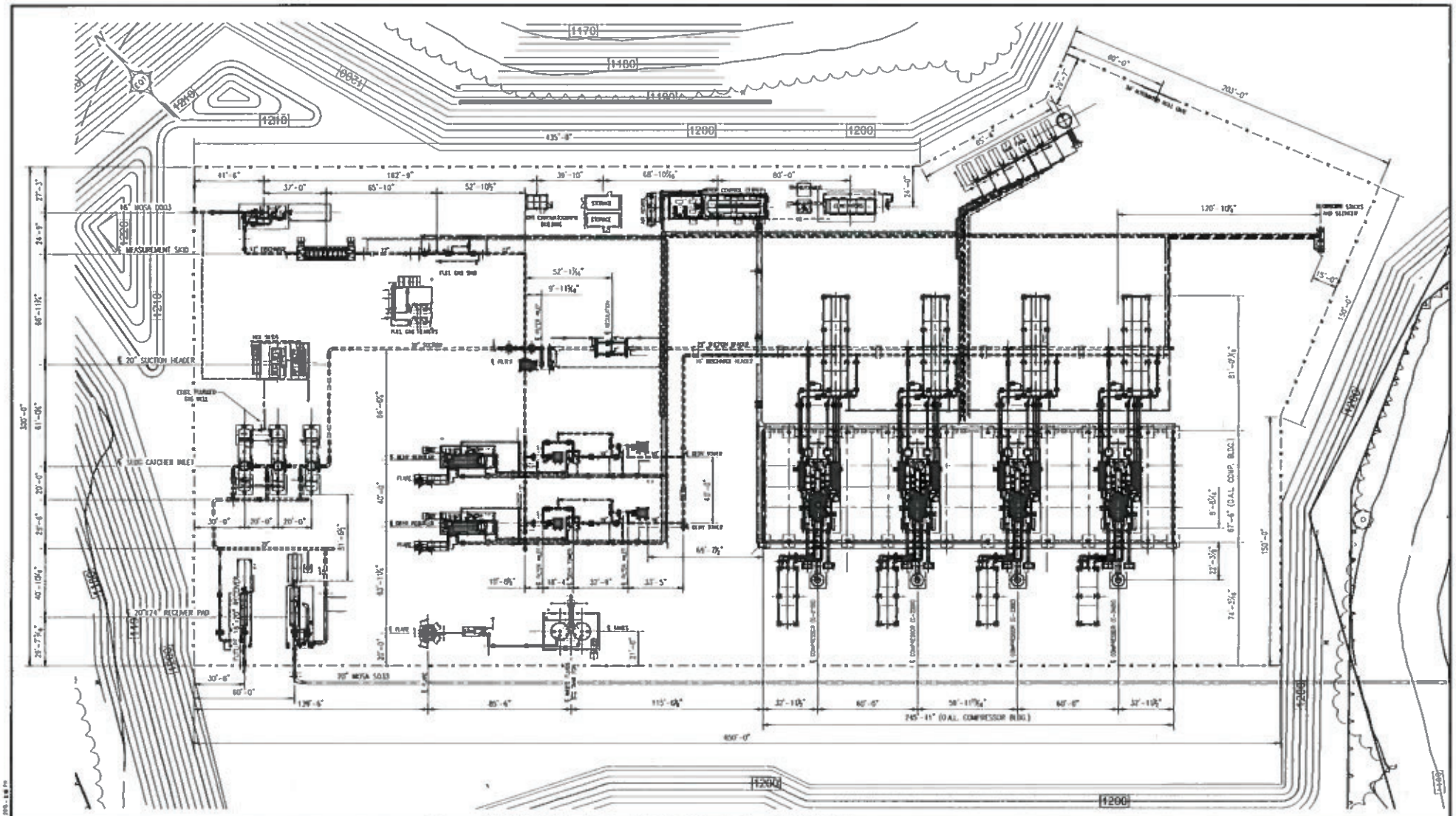
EQM GATHERING OPCO, LLC
JANUS COMPRESSOR STATION
DODDRIDGE COUNTY, WEST VIRGINIA

AREA MAP

DRAWN BY:	DWD	CHECKED BY:	ZMS	APPROVED BY:	AB*	ATTACHMENT:	A
DATE:	3/6/2024	DWG SCALE:	1"=500'	PROJECT NO:	334-808.0001		

P:\330-000\334-808\-CADD\Dwg\AQ01\334808-AQ01-SITE LOCATION MAP.dwg{FIGURE 1} LS:(1/22/2024 - ddiable) - LP: 3/6/2024 9:21 AM

ATTACHMENT B
PLOT PLAN



DRAWING NUMBER	DRAWING TITLE	RE	DATE	REVISION	BY	CHK	APPD	RE	DATE	REVISION	BY	CHK	APPD
		P	6/16/15	ISSUED FOR 30% REVIEW									

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

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™

DESIGN ENGINEER (DM)

PROJECT #

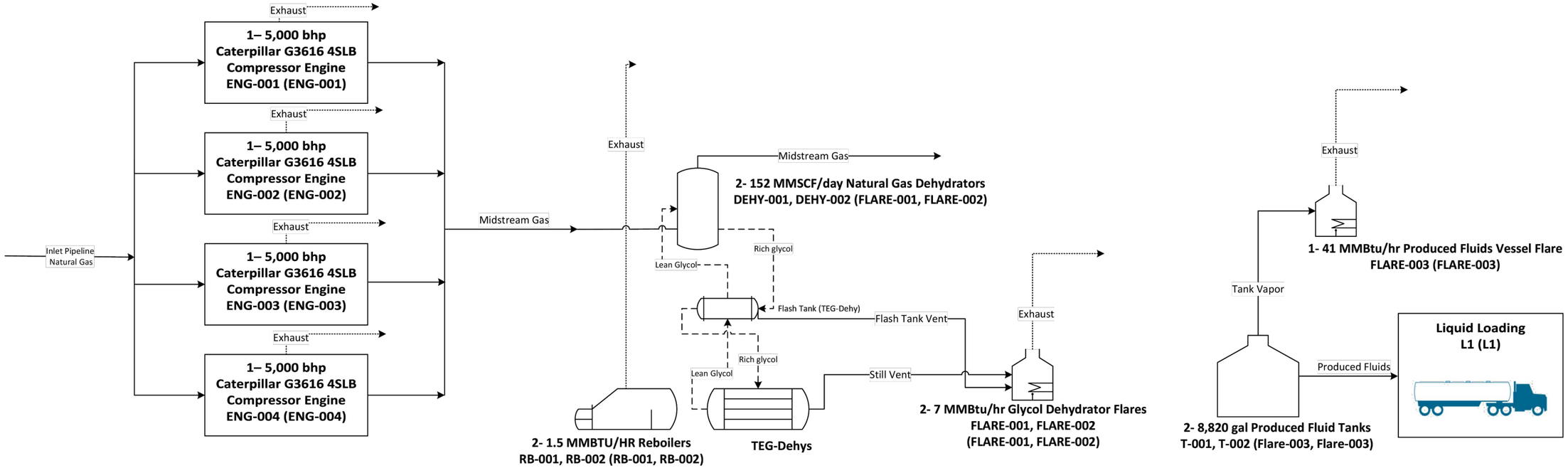
DRAWING SCALE: 1"=25'-0"

DRAWING TITLE:

JANUS COMPRESSOR STATION
2016 COMPRESSOR AND DEHY INSTALLATION
PIPING
PLOT PLAN

FACILITY	STATE	IDENTIFICATION	SERIES	SHEET	REVISION
C	W	JAN01	1100	02	P

ATTACHMENT C
PROCESS FLOW DIAGRAM



1– 1.0 MMBtu Fuel Gas Heater 1 HTR-1 (HTR-1)	1– 0.75 MMBtu Fuel Gas Heater 2 HTR-2 (HTR-2)	2– 0.006 MMBtu/hr Suction Condensate Heaters HTR-3, HTR-4 (HTR-3, HTR-4)	Compressor, Filter Maintenance, and Facility Blowdowns BLD (BLD)
5 – 0.2 MW Capstone C200 Microturbines EG-001, EG-002, EG-003, EG-004, EG-005 (EG-001, EG-002, EG-003, EG-004, EG-005)	1 – 2,000 gal Engine Lube Oil Tank T-003 (T-003)	1 – 2,000 gal Compressor Lube Oil Tank T-004 (T-004)	Fugitive Equipment Leaks, Rod Packing, Pigging and Intermittent Bleed Pneumatics FUG (FUG)
1 – 2,000 gal New MEG Storage Tank T-005 (T-005)	1 – 2,000 gal Used MEG Storage Tank T-006 (T-006)	1 – 4,200 gal Used Oil Storage Tank T-007 (T-007)	Haul Roads ROAD (ROAD)
4 – 302 gal Engine Lube Oil Storage Tanks T-009, T-010, T-011, T-012 (T-009, T-010, T-011, T-012)	4 – 302 gal Compressor Lube Oil Storage Tanks T-013, T-014, T-015, T-016 (T-013, T-014, T-015, T-016)	1 – 2,000 gal Used TEG Storage Tank T-024 (T-024)	1 – 2,000 gal New TEG Storage Tank T-023 (T-023)

*HAND SIGNATURE ON FILE

Civil & Environmental Consultants, Inc.
700 Cherrington Parkway
Moon Township, PA 15108
Ph: 412.429.2324 · 800.365.2324
www.cecinc.com

EQM GATHERING OPCO, LLC
JANUS COMPRESSOR STATION
DODDRIDGE COUNTY, WEST VIRGINIA

PROCESS FLOW DIAGRAM

DRAWN BY:	DWD	CHECKED BY:	ZMS	APPROVED BY:	AB*	ATTACHMENT:	C
DATE:	3/6/2024	DWG SCALE:	NTS	PROJECT NO:	334.808.0001		

ATTACHMENT D
EQUIPMENT TABLE

ATTACHMENT D - Title V Equipment Table

(includes all emission units at the facility except those designated as insignificant activities in Section 4, Item 24 of the General Forms)

Emission Unit ID[1]	Emission Point ID[1]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Control Device[1]
ENG-001	ENG-001	Caterpillar G3616 4SLB Compressor Engine	2016	5,000 bhp	Oxidation Catalyst (C1)
ENG-002	ENG-002	Caterpillar G3616 4SLB Compressor Engine	2016	5,000 bhp	Oxidation Catalyst (C2)
ENG-003	ENG-003	Caterpillar G3616 4SLB Compressor Engine	2017	5,000 bhp	Oxidation Catalyst (C3)
ENG-004	ENG-004	Caterpillar G3616 4SLB Compressor Engine	2017	5,000 bhp	Oxidation Catalyst (C4)
DEHY-001	FLARE-001	Glycol Dehydration Unit Flash Tank and Still Column	2016	152 MMSCF/day	FLARE-001
FLARE-001	FLARE-001	Glycol Dehydrator Flare 1	2016	7 MMBtu/hr	FLARE-001
RB-001	RB-001	Glycol Dehydration Unit Reboiler	2016	1.5 MMBtu/hr	None
DEHY-002	FLARE-002	Glycol Dehydration Unit Flash Tank and Still Column	2017	152 MMSCF/day	FLARE-002
FLARE-002	FLARE-002	Glycol Dehydrator Flare 2	2016	7 MMBtu/hr	FLARE-002
RB-002	RB-002	Glycol Dehydration Unit Reboiler	2017	1.5 MMBtu/hr	None
T-001	FLARE-003	Produced Fluids Vessel T-8110	2016	210 bbl	FLARE-003
T-002	FLARE-003	Produced Fluids Vessel T-8120	2016	210 bbl	FLARE-003
FLARE-003	FLARE-003	Produced Fluids Vessel Flare	2016	41 MMBtu/hr	FLARE-003
L1	L1	Liquid Loading	2016	420,000 gal/yr	None
HTR-1	HTR-1	Fuel Gas Heater	2016	1.0 MMBtu/hr	None
HTR-2	HTR-2	Fuel Gas Heater	2016	0.75 MMBtu/hr	None
HTR-3	HTR-3	#1 Suction Condensate Heater	2016	6 MBtu/hr	None
HTR-4	HTR-4	#2 Suction Condensate Heater	2016	6 MBtu/hr	None
EG-001	EG-002	Capstone C200 Microturbine	2016	200 KW	None
EG-002	EG-002	Capstone C200 Microturbine	2016	200 KW	None
EG-003	EG-003	Capstone C200 Microturbine	2016	200 KW	None
EG-004	EG-004	Capstone C200 Microturbine	2016	200 KW	None
EG-005	EG-005	Capstone C200 Microturbine	2016	200 KW	None
T-003	T-003	Engine Lube Oil Tank	2016	2,000 gallons	None
T-004	T-004	Compressor Lube Oil Tank	2016	2,000 gallons	None

[1]For 45CSR13 permitted sources, the numbering system used for the emission points, control devices, and emission units should be consistent with the numbering system used in the 45CSR13 permit. For grandfathered sources, the numbering system should be consistent with registrations or emissions inventory previously submitted to DAQ. For emission points, control devices, and emissions units which have not been previously labeled, use the following 45CSR13 numbering system: 1S, 2S, 3S,... or other appropriate description for emission units; 1C, 2C, 3C,... or other appropriate designation for control devices; 1E, 2E, 3E, ... or other appropriate designation for emission points.

ATTACHMENT D - Title V Equipment Table

(includes all emission units at the facility except those designated as insignificant activities in Section 4, Item 24 of the General Forms)

Emission Unit ID[1]	Emission Point ID[1]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Control Device[1]
T-005	T-005	New MEG Storage Tank	2016	2,000 gallons	None
T-006	T-006	Used MEG Storage Tank	2016	2,000 gallons	None
T-007	T-007	Used Oil Storage Tank	2016	4,200 gallons	None
T-009	T-009	Engine Lube Oil Storage Tank	2016	300 gallons	None
T-010	T-010	Engine Lube Oil Storage Tank	2016	300 gallons	None
T-011	T-011	Engine Lube Oil Storage Tank	2016	300 gallons	None
T-012	T-012	Engine Lube Oil Storage Tank	2016	300 gallons	None
T-013	T-013	Compressor Lube Oil Storage Tank	2016	300 gallons	None
T-014	T-014	Compressor Lube Oil Storage Tank	2016	300 gallons	None
T-015	T-015	Compressor Lube Oil Storage Tank	2016	300 gallons	None
T-016	T-016	Compressor Lube Oil Storage Tank	2016	300 gallons	None
T-023	T-023	New TEG Storage Tank	2016	2,000 gallons	None
T-024	T-024	Used TEG Storage Tank	2016	2,000 gallons	None

[1]For 45CSR13 permitted sources, the numbering system used for the emission points, control devices, and emission units should be consistent with the numbering system used in the 45CSR13 permit. For grandfathered sources, the numbering system should be consistent with registrations or emissions inventory previously submitted to DAQ. For emission points, control devices, and emissions units which have not been previously labeled, use the following 45CSR13 numbering system: 1S, 2S, 3S,... or other appropriate description for emission units; 1C, 2C, 3C,... or other appropriate designation for control devices; 1E, 2E, 3E, ... or other appropriate designation for emission points.

ATTACHMENT E
EMISSION UNIT FORMS

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
DEHY-001 to DEHY-002	TEG Dehydration Units	FLARE-001 to FLARE-002

Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable)

Triethylene Glycol dehydration unit for removing water from natural gas.

Manufacturer:	**Model number:**	**Serial number:**

Construction date: MM/DD/YYYY	**Installation date:** MM/DD/YYYY	**Modification date(s):** MM/DD/YYYY
2016	2016	2017

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

152 million standard cubic feet per day MMSCFD (each)

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
6.33 MMscf/hr	55,480 MMscf/yr	8,760 hours

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? ☐ Yes ☑ No	**If yes, is it?** ☐ Indirect Fired ☐ Direct Fired
Maximum design heat input and/or maximum horsepower rating: N/A	**Type and Btu/hr rating of burners:** N/A

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.

N/A

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	--	--
Nitrogen Oxides (NO_X)	--	--
Lead (Pb)	--	--
Particulate Matter ($PM_{2.5}$)	--	--
Particulate Matter (PM_{10})	--	--
Total Particulate Matter (TSP)	--	--
Sulfur Dioxide (SO_2)	--	--
Volatile Organic Compounds (VOC)	1.07	4.68
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	0.11	0.48
n-Hexane	0.01	0.05
Total HAP	0.34	1.49
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
CO2e	19.78	86.65

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

GRI-GLYCalc 4.0

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

No change from existing requirements in Title V Operating Permit R30-01700158-2019

☐ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

No change from existing requirements in Title V Operating Permit R30-01700158-2019

Are you in compliance with all applicable requirements for this emission unit? ☑ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
EG-001 to EG-005	Microturbines	N/A

Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable)

Five (5) Capstone Microturbines (each rated at 200 kW) for generating electricity.

Manufacturer:	**Model number:**	**Serial number:**
Capstone	C200	

Construction date: MM/DD/YYYY	**Installation date:** MM/DD/YYYY	**Modification date(s):** MM/DD/YYYY
2016	2016	N/A

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

200 kW (each)

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
1,860 scf/hr (each)	16.29 MMscf/yr (each)	8,760 hours (each)

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? ☑ Yes ☐ No	**If yes, is it?** ☐ Indirect Fired ☐ Direct Fired
Maximum design heat input and/or maximum horsepower rating: 2.28 MMBtu/hr (each)	**Type and Btu/hr rating of burners:** 2.28 MMBtu/hr (each)

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.

Natural Gas - 1,860 scf/hr (each), 16.29 MMscf/yr (each)

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	Negl.	Negl.	1,222 Btu/scf

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	0.22	0.96
Nitrogen Oxides (NO_X)	0.08	0.35
Lead (Pb)	--	--
Particulate Matter ($PM_{2.5}$)	0.02	0.07
Particulate Matter (PM_{10})	0.02	0.07
Total Particulate Matter (TSP)	0.02	0.07
Sulfur Dioxide (SO_2)	0.01	0.03
Volatile Organic Compounds (VOC)	0.02	0.09
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Total HAP	<0.01	0.01
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
CO2e	266.28	1166.29

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

Emission factors from AP-42 Section 3.1, Tables 3.1-2a and 3.1-3.
VOC, NOx, CO, and CO2 emission factors from Table 1 and Table 5 (CO2) of Capstone Microturbine Systems Emissions sheet. CH4 and N2O emission factors from Tables C-1 and C-2 of 40 CFR Part 98, Subpart C.

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

No change from existing requirements in Title V Operating Permit R30-01700158-2019

☐ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

No change from existing requirements in Title V Operating Permit R30-01700158-2019

Are you in compliance with all applicable requirements for this emission unit? ☑ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
ENG-001 to ENG-004	CAT G3616 Compressor Engines	C1 to C4 (Oxidation Catalysts)

Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable)

Four (4) natural gas-fired 5,000 horsepower (hp) reciprocating internal combustion engines that drive compressors for the compression of natural gas.

Manufacturer:	**Model number:**	**Serial number:**
Caterpillar	G3616	
Construction date: MM/DD/YYYY 2016	**Installation date:** MM/DD/YYYY 2016	**Modification date(s):** MM/DD/YYYY

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

5,000 HP (each)

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
30,205 scf/hr (each)	264.6 MMscf/yr (each)	8,760 hours (each)

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? ☑ Yes ☐ No	**If yes, is it?** ☐ Indirect Fired ☐ Direct Fired
Maximum design heat input and/or maximum horsepower rating: 5,000 HP (each) 36.91 MMBtu/hr (each)	**Type and Btu/hr rating of burners:** 36.91 MMBtu/hr (each)

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.

Natural Gas - 30,205 scf/hr (each), 264.6 MMscf/yr (each)

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	Negl.	Negl.	1,222 BTU/scf

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	1.91	8.35
Nitrogen Oxides (NO_X)	5.51	24.14
Lead (Pb)	--	--
Particulate Matter ($PM_{2.5}$)	0.37	1.61
Particulate Matter (PM_{10})	0.37	1.61
Total Particulate Matter (TSP)	0.37	1.61
Sulfur Dioxide (SO_2)	0.02	0.10
Volatile Organic Compounds (VOC)	3.93	17.20
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Formaldehyde (HCHO)	0.22	0.97
Total HAP	0.94	4.10
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
CO2e	5,425.80	23,764.99

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

SO2, 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. NOx, VOC, CO and Formaldehyde emission factors are based on manufacturer's guarantees for the oxidation catalyst. Methane and Carbon Dioxide are based on manufacturer's guarantees for the engine. Greenhouse gas emission factors are based on 40 CFR Part 98, Subpart C, Tables C-1 and C-2 for natural gas combustion.

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

No change from existing requirements in Title V Operating Permit R30-01700158-2019

☐ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

No change from existing requirements in Title V Operating Permit R30-01700158-2019

Are you in compliance with all applicable requirements for this emission unit? ☑ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
HTR-1	Fuel Gas Heater	N/A

Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable)

One (1) 1.0 MMBtu/hr natural gas-fired fuel gas heater.

Manufacturer:	**Model number:**	**Serial number:**

Construction date: MM/DD/YYYY	**Installation date:** MM/DD/YYYY	**Modification date(s):** MM/DD/YYYY
2016	2016	N/A

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

1.0 MMBtu/hr

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
818.33 scf/hr	7.17 MMscf/yr	8,760 hours

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? ☑ Yes ☐ No	**If yes, is it?** ☑ Indirect Fired ☐ Direct Fired
Maximum design heat input and/or maximum horsepower rating: 1.0 MMBtu/hr	**Type and Btu/hr rating of burners:** 1.0 MMBtu/hr

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.

Natural Gas - 818.33 scf/hr

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	Negl.	Negl.	1,222 BTU/scf

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	0.07	0.30
Nitrogen Oxides (NO_X)	0.08	0.36
Lead (Pb)	<0.01	<0.01
Particulate Matter ($PM_{2.5}$)	0.01	0.03
Particulate Matter (PM_{10})	0.01	0.03
Total Particulate Matter (TSP)	0.01	0.03
Sulfur Dioxide (SO_2)	<0.01	<0.01
Volatile Organic Compounds (VOC)	<0.01	0.02
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Total HAP	1.54E-3	6.77E-03
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
CO2e	98.78	432.67

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

Criteria pollutant and HAP emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, 1.4-3, & 1.4-4. Greenhouse gas emission factors from 40 CFR Part 98 Tables C-1 and C-2.

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

No change from existing requirements in Title V Operating Permit R30-01700158-2019

☐ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

No change from existing requirements in Title V Operating Permit R30-01700158-2019

Are you in compliance with all applicable requirements for this emission unit? ☑ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
HTR-2	Fuel Gas Heater	N/A

Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable)

One (1) 0.75 MMBtu/hr natural gas-fired fuel gas heater.

Manufacturer:	**Model number:**	**Serial number:**

Construction date: MM/DD/YYYY	**Installation date:** MM/DD/YYYY	**Modification date(s):** MM/DD/YYYY
2016	2016	N/A

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

0.75 MMBtu/hr

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
613.7 scf/hr	5.38 MMscf/yr	8,760 hours

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? ☑ Yes ☐ No	**If yes, is it?** ☑ Indirect Fired ☐ Direct Fired
Maximum design heat input and/or maximum horsepower rating: 0.75 MMBtu/hr	**Type and Btu/hr rating of burners:** 0.75 MMBtu/hr

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.

Natural Gas - 613.7 scf/hr, 5.38 MMscf/yr

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	Negl.	Negl.	1,222 BTU/scf

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	0.05	0.23
Nitrogen Oxides (NO_X)	0.06	0.27
Lead (Pb)	<0.01	<0.01
Particulate Matter ($PM_{2.5}$)	<0.01	0.02
Particulate Matter (PM_{10})	<0.01	0.02
Total Particulate Matter (TSP)	<0.01	0.02
Sulfur Dioxide (SO_2)	<0.01	<0.01
Volatile Organic Compounds (VOC)	<0.01	0.01
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Total HAP	1.16E-03	5.08E-03
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
CO2e	74.09	324.50

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

Criteria pollutant and HAP emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, 1.4-3, & 1.4-4. Greenhouse gas emission factors from 40 CFR Part 98 Tables C-1 and C-2.

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

No change from existing requirements in Title V Operating Permit R30-01700158-2019

☐ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

No change from existing requirements in Title V Operating Permit R30-01700158-2019

Are you in compliance with all applicable requirements for this emission unit? ☑ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
HTR-3, HTR-4	Suction Condensate Heaters	None

Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable)

Two (2) 6.0 MBtu/hr natural gas-fired heaters.

Manufacturer:	**Model number:**	**Serial number:**

Construction date: MM/DD/YYYY	**Installation date:** MM/DD/YYYY	**Modification date(s):** MM/DD/YYYY
2016	2016	N/A

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

6.0 MBtu/hr (each)

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
4.9 scf/hr (each)	0.04 MMscf/yr (each)	8,760 hours (each)

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? ☑ Yes ☐ No	**If yes, is it?** ☑ Indirect Fired ☐ Direct Fired
Maximum design heat input and/or maximum horsepower rating: 6.0 MBtu/hr (each)	**Type and Btu/hr rating of burners:** 6.0 MBtu/hr (each)

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.

Natural Gas - 4.9 scf/hr (each), 0.04 MMscf/yr (each)

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	Negl.	Negl.	1,222 BTU/scf

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	<0.01	<0.01
Nitrogen Oxides (NO_X)	<0.01	<0.01
Lead (Pb)	<0.01	<0.01
Particulate Matter ($PM_{2.5}$)	<0.01	<0.01
Particulate Matter (PM_{10})	<0.01	<0.01
Total Particulate Matter (TSP)	<0.01	<0.01
Sulfur Dioxide (SO_2)	<0.01	<0.01
Volatile Organic Compounds (VOC)	<0.01	<0.01
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Total HAP	9.27E-06	4.06E-05
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
CO2e	0.59	2.60

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

Criteria pollutant and HAP emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, 1.4-3, & 1.4-4. Greenhouse gas emission factors from 40 CFR Part 98 Tables C-1 and C-2.

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

No change from existing requirements in Title V Operating Permit R30-01700158-2019

☐ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

No change from existing requirements in Title V Operating Permit R30-01700158-2019

Are you in compliance with all applicable requirements for this emission unit? ☑ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
RB-001 to RB-002	Dehydrator Reboilers	None

Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable)

Two (2) 1.5 MMBtu/hr natural gas-fired reboilers associated with dehydration units (DEHY-001 to DEHY-002)

Manufacturer:	**Model number:**	**Serial number:**

Construction date: MM/DD/YYYY	**Installation date:** MM/DD/YYYY	**Modification date(s):** MM/DD/YYYY
2016	2016	N/A

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

1.5 MMBtu/hr (each)

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
1227.5 scf/hr (each)	10.8 MMscf/yr (each)	8,760 hours

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? ☑ Yes ☐ No	**If yes, is it?** ☑ Indirect Fired ☐ Direct Fired
Maximum design heat input and/or maximum horsepower rating: 1.5 MMBtu/hr	**Type and Btu/hr rating of burners:** 1.5 MMBtu/hr

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.

Natural Gas - 1227.5 scf/hr (each), 10.8 MMscf/yr (each)

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	Negl.	Negl.	1,222 BTU/scf

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	0.10	0.45
Nitrogen Oxides (NO_X)	0.12	0.54
Lead (Pb)	<0.01	<0.01
Particulate Matter ($PM_{2.5}$)	0.01	0.04
Particulate Matter (PM_{10})	0.01	0.04
Total Particulate Matter (TSP)	0.01	0.04
Sulfur Dioxide (SO_2)	<0.01	<0.01
Volatile Organic Compounds (VOC)	0.01	0.03
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Total HAP	2.32E-03	1.02E-02
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
CO2e	148.17	649.01

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

Criteria pollutants and HAP emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, 1.4-3, & 1.4-4. Greenhouse gas emission factors from 40 CFR Part 98 Tables C-1 and C-2.

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

No change from existing requirements in Title V Operating Permit R30-01700158-2019

☐ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

No change from existing requirements in Title V Operating Permit R30-01700158-2019

Are you in compliance with all applicable requirements for this emission unit? ☑ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
T-001-T-002	Produced Fluids Tanks	FLARE-003

Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable)

Two (2) 8,820 gallon storage tanks for produced fluids

Manufacturer:	**Model number:**	**Serial number:**

Construction date: MM/DD/YYYY	**Installation date:** MM/DD/YYYY	**Modification date(s):** MM/DD/YYYY
2016	2016	2017

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

8,820 gallons (each)

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
	210,000 gal/yr (each)	8,760 hours (each)

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? ☐ Yes ☑ No	**If yes, is it?** ☐ Indirect Fired ☐ Direct Fired
Maximum design heat input and/or maximum horsepower rating: N/A	**Type and Btu/hr rating of burners:** N/A

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.

N/A

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	--	--
Nitrogen Oxides (NO_X)	--	--
Lead (Pb)	--	--
Particulate Matter ($PM_{2.5}$)	--	--
Particulate Matter (PM_{10})	--	--
Total Particulate Matter (TSP)	--	--
Sulfur Dioxide (SO_2)	--	--
Volatile Organic Compounds (VOC)	0.20	0.88
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Formaldehyde	--	--
Total HAP	0.04	0.18
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
CO2e	0.82	3.59

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

BR&E ProMax

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

No change from existing requirements in Title V Operating Permit R30-01700158-2019

☐ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

No change from existing requirements in Title V Operating Permit R30-01700158-2019

Are you in compliance with all applicable requirements for this emission unit? ☑ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT G
AIR POLLUTION CONTROL DEVICE FORMS

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number:	List all emission units associated with this control device.	
FLARE-001 to FLARE-002	DEHY-001 to DEHY-002	
Manufacturer: Envirotherm	**Model number:** ET1-DVC-36-20	**Installation date:** MM/DD/YYYY 2016

Type of Air Pollution Control Device:

___ Baghouse/Fabric Filter	___ Venturi Scrubber	___ Multiclone
___ Carbon Bed Absorber	___ Packed Tower Scrubber	___ Single Cyclone
___ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
___ Thermal Incinerator	___ Flare	✓ Other (describe) Enclosed Flare
___ Wet Plate Electrostatic Precipitator		___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
VOC	100%	98%
HAP	100%	98%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).

Flare Rating - 7 MMBtu/hr, Pilot Rating - 0.09 MMBtu/hr

Is this device subject to the CAM requirements of 40 C.F.R. 64? ___ Yes ✓ No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.** Refer to Sections 2.1 and 2.2 of Regulatory Analysis.

Describe the parameters monitored and/or methods used to indicate performance of this control device.

Pilot flame is equipped with a thermocouple.

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number:	**List all emission units associated with this control device.**	
FLARE-003	T-001 to T-002	
Manufacturer:	**Model number:**	**Installation date:** MM/DD/YYYY
Envirotherm	EF-96-30	2016

Type of Air Pollution Control Device:

___ Baghouse/Fabric Filter	___ Venturi Scrubber	___ Multiclone
___ Carbon Bed Absorber	___ Packed Tower Scrubber	___ Single Cyclone
___ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
___ Thermal Incinerator	___ Flare	✓ Other (describe) Enclosed Flare
___ Wet Plate Electrostatic Precipitator		___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
VOC	100%	95%
HAP	100%	95%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).

Flare Rating - 41 MMBtu/hr, Pilot Rating - 0.12 MMBtu/hr

Is this device subject to the CAM requirements of 40 C.F.R. 64? ___ Yes ✓ No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.** CAM is not applicable, as pre-controlled emissions are less than 100 percent of major source thresholds.

Describe the parameters monitored and/or methods used to indicate performance of this control device.

Pilot flame is equipped with a thermocouple.

ATTACHMENT H
COMPLIANCE ASSURANCE MONITORING PLAN

ATTACHMENT H - Compliance Assurance Monitoring (CAM) Plan Form

For definitions and information about the CAM rule, please refer to 40 CFR Part 64. Additional information (including guidance documents) may also be found at http://www.epa.gov/ttn/emc/cam.html

CAM APPLICABILITY DETERMINATION

1) Does the facility have a PSEU (Pollutant-Specific Emissions Unit considered separately with respect to **EACH** regulated air pollutant) that is subject to CAM (40 CFR Part 64), which must be addressed in this CAM plan submittal? To determine applicability, a PSEU must meet **all** of the following criteria (*If No, then the remainder of this form need not be completed*): ☐ YES ☑ NO

a. The PSEU is located at a major source that is required to obtain a Title V permit;

b. The PSEU is subject to an emission limitation or standard for the applicable regulated air pollutant that is NOT exempt;

LIST OF EXEMPT EMISSION LIMITATIONS OR STANDARDS:

- NSPS (40 CFR Part 60) or NESHAP (40 CFR Parts 61 and 63) proposed after 11/15/1990.
- Stratospheric Ozone Protection Requirements.
- Acid Rain Program Requirements.
- Emission Limitations or Standards for which a WVDEP Division of Air Quality Title V permit specifies a continuous compliance determination method, as defined in 40 CFR §64.1.
- An emission cap that meets the requirements specified in 40 CFR §70.4(b)(12).

c. The PSEU uses an add-on control device (as defined in 40 CFR §64.1) to achieve compliance with an emission limitation or standard;

d. The PSEU has potential pre-control device emissions of the applicable regulated air pollutant that are equal to or greater than the Title V Major Source Threshold Levels; AND

e. The PSEU is NOT an exempt backup utility power emissions unit that is municipally-owned.

BASIS OF CAM SUBMITTAL

2) Mark the appropriate box below as to why this CAM plan is being submitted as part of an application for a Title V permit:

☐ RENEWAL APPLICATION. **ALL** PSEUs for which a CAM plan has NOT yet been approved need to be addressed in this CAM plan submittal.

☐ INITIAL APPLICATION (submitted after 4/20/98). **ONLY** large PSEUs (i. e., PSEUs with potential post-control device emissions of an applicable regulated air pollutant that are equal to or greater than Major Source Threshold Levels) need to be addressed in this CAM plan submittal.

☐ SIGNIFICANT MODIFICATION TO LARGE PSEUs. **ONLY** large PSEUs being modified after 4/20/98 need to be addressed in this cam plan submittal. For large PSEUs with an approved CAM plan, Only address the appropriate monitoring requirements affected by the significant modification.

3) [a] BACKGROUND DATA AND INFORMATION					
Complete the following table for **all** PSEUs that need to be addressed in this CAM plan submittal. This section is to be used to provide background data and information for each PSEU In order to supplement the submittal requirements specified in 40 CFR §64.4. If additional space is needed, attach and label accordingly.					
PSEU DESIGNATION	DESCRIPTION	POLLUTANT	CONTROL DEVICE	[b] EMISSION LIMITATION or STANDARD	[c] MONITORING REQUIREMENT
EXAMPLE Boiler No. 1	Wood-Fired Boiler	PM	Multiclone	45CSR§2-4.1.c.; 9.0 lb/hr	Monitor pressure drop across multiclone: Weekly inspection of multiclone

[a] If a control device is common to more than one PSEU, one monitoring plan may be submitted for the control device with the affected PSEUs identified and any conditions that must be maintained or monitored in accordance with 40 CFR §64.3(a). If a single PSEU is controlled by more than one control device similar in design and operation, one monitoring plan for the applicable control devices may be submitted with the applicable control devices identified and any conditions that must be maintained or monitored in accordance with 40 CFR §64.3(a).

[b] Indicate the emission limitation or standard for any applicable requirement that constitutes an emission limitation, emission standard, or standard of performance (as defined in 40 CFR §64.1).

[c] Indicate the monitoring requirements for the PSEU that are required by an applicable regulation or permit condition.

CAM MONITORING APPROACH CRITERIA			
Complete this section for **EACH** PSEU that needs to be addressed in this CAM plan submittal. This section may be copied as needed for each PSEU. This section is to be used to provide monitoring data and information for EACH indicator selected for EACH PSEU in order to meet the monitoring design criteria specified in 40 CFR §64.3 and §64.4. if more than two indicators are being selected for a PSEU or if additional space is needed, attach and label accordingly with the appropriate PSEU designation, pollutant, and indicator numbers.			
4a) PSEU Designation:	**4b) Pollutant:**	**4c) [a] Indicator No. 1:**	**4d) [a] Indicator No. 2:**
5a) GENERAL CRITERIA Describe the MONITORING APPROACH used to measure the indicators:			
[b] Establish the appropriate INDICATOR RANGE or the procedures for establishing the indicator range which provides a reasonable assurance of compliance:			
5b) PERFORMANCE CRITERIA Provide the SPECIFICATIONS FOR OBTAINING REPRESENTATIVE DATA, such as detector location, installation specifications, and minimum acceptable accuracy:			
[c] For new or modified monitoring equipment, provide VERIFICATION PROCEDURES, including manufacturer's recommendations, TO CONFIRM THE OPERATIONAL STATUS of the monitoring:			
Provide QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC) PRACTICES that are adequate to ensure the continuing validity of the data, (i.e., daily calibrations, visual inspections, routine maintenance, RATA, etc.):			
[d] Provide the MONITORING FREQUENCY:			
Provide the DATA COLLECTION PROCEDURES that will be used:			
Provide the DATA AVERAGING PERIOD for the purpose of determining whether an excursion or exceedance has occurred:			

[a] Describe all indicators to be monitored which satisfies 40 CFR §64.3(a). Indicators of emission control performance for the control device and associated capture system may include measured or predicted emissions (including visible emissions or opacity), process and control device operating parameters that affect control device (and capture system) efficiency or emission rates, or recorded findings of inspection and maintenance activities.

[b] Indicator Ranges may be based on a single maximum or minimum value or at multiple levels that are relevant to distinctly different operating conditions, expressed as a function of process variables, expressed as maintaining the applicable indicator in a particular operational status or designated condition, or established as interdependent between more than one indicator. For CEMS, COMS, or PEMS, include the most recent certification test for the monitor.

[c] The verification for operational status should include procedures for installation, calibration, and operation of the monitoring equipment, conducted in accordance with the manufacturer's recommendations, necessary to confirm the monitoring equipment is operational prior to the commencement of the required monitoring.

[d] Emission units with post-control PTE ≥ 100 percent of the amount classifying the source as a major source (i.e., Large PSEU) must collect four or more values per hour to be averaged. A reduced data collection frequency may be approved in limited circumstances. Other emission units must collect data at least once per 24 hour period.

RATIONALE AND JUSTIFICATION

Complete this section for **EACH** PSEU that needs to be addressed in this CAM plan submittal. This section may be copied as needed for each PSEU. This section is to be used to provide rationale and justification for the selection of EACH indicator and monitoring approach and EACH indicator range in order to meet the submittal requirements specified in 40 CFR §64.4.

6a) PSEU Designation:	6b) Regulated Air Pollutant:

7) **INDICATORS AND THE MONITORING APPROACH**: Provide the rationale and justification for the selection of the indicators and the monitoring approach used to measure the indicators. Also provide any data supporting the rationale and justification. Explain the reasons for any differences between the verification of operational status or the quality assurance and control practices proposed, and the manufacturer's recommendations. (If additional space is needed, attach and label accordingly with the appropriate PSEU designation and pollutant):

8) **INDICATOR RANGES**: Provide the rationale and justification for the selection of the indicator ranges. The rationale and justification shall indicate how **EACH** indicator range was selected by either a COMPLIANCE OR PERFORMANCE TEST, a TEST PLAN AND SCHEDULE, or by ENGINEERING ASSESSMENTS. Depending on which method is being used for each indicator range, include the specific information required below for that specific indicator range. (If additional space is needed, attach and label accordingly with the appropriate PSEU designation and pollutant):

- COMPLIANCE OR PERFORMANCE TEST (Indicator ranges determined from control device operating parameter data obtained during a compliance or performance test conducted under regulatory specified conditions or under conditions representative of maximum potential emissions under anticipated operating conditions. Such data may be supplemented by engineering assessments and manufacturer's recommendations). The rationale and justification shall INCLUDE a summary of the compliance or performance test results that were used to determine the indicator range, and documentation indicating that no changes have taken place that could result in a significant change in the control system performance or the selected indicator ranges since the compliance or performance test was conducted.

- TEST PLAN AND SCHEDULE (Indicator ranges will be determined from a proposed implementation plan and schedule for installing, testing, and performing any other appropriate activities prior to use of the monitoring). The rationale and justification shall INCLUDE the proposed implementation plan and schedule that will provide for use of the monitoring as expeditiously as practicable after approval of this CAM plan, except that in no case shall the schedule for completing installation and beginning operation of the monitoring exceed 180 days after approval.

- ENGINEERING ASSESSMENTS (Indicator Ranges or the procedures for establishing indicator ranges are determined from engineering assessments and other data, such as manufacturers' design criteria and historical monitoring data, because factors specific to the type of monitoring, control device, or PSEU make compliance or performance testing unnecessary). The rationale and justification shall INCLUDE documentation demonstrating that compliance testing is not required to establish the indicator range.

RATIONALE AND JUSTIFICATION:

ATTACHMENT I
EMISSION CALCULATIONS

Civil & Environmental Consultants, Inc.

SUBJECT	PTE Calculations - Site Info			PROJECT NO.	334-808
PROJECT	EQM Gathering OPCO, LLC - Janus Compressor Station			SHEET	1
	Doddridge County, West Virginia				
MADE BY:	ZMS	DATE: 3/5/2024	CHECKED BY: AMH	DATE:	3/5/2024

Emission Unit ID	Emission Point ID	Emission Unit Description	Unit Design Capacity		Operating Hours (hr/yr)	Control Device
ENG-001	ENG-001	Caterpillar G3616 4SLB Compressor Engine	5000	bhp	8,760	Oxidation Catalyst (C1)
ENG-002	ENG-002	Caterpillar G3616 4SLB Compressor Engine	5000	bhp	8,760	Oxidation Catalyst (C2)
ENG-003	ENG-003	Caterpillar G3616 4SLB Compressor Engine	5000	bhp	8,760	Oxidation Catalyst (C3)
ENG-004	ENG-004	Caterpillar G3616 4SLB Compressor Engine	5000	bhp	8,760	Oxidation Catalyst (C4)
DEHY-001	FLARE-001	Glycol Dehydration Unit Flash Tank and Still Column	152	MMScf/day	8,760	FLARE-001
FLARE-001	FLARE-001	Glycol Dehydrator Flare 1	7	MMBtu/hr	8,760	--
RB-001	RB-001	Glycol Dehydration Unit Reboiler	1.5	MMBtu/hr	8,760	--
DEHY-002	FLARE-002	Glycol Dehydration Unit Flash Tank and Still Column	152	MMScf/day	8,760	FLARE-002
FLARE-002	FLARE-002	Glycol Dehydrator Flare 2	7	MMBtu/hr	8,760	--
RB-002	RB-002	Glycol Dehydration Unit Reboiler	1.5	MMBtu/hr	8,760	--
T-001	FLARE-003	Produced Fluids Vessel T-8110	8820	gal	8,760	FLARE-003
T-002	FLARE-003	Produced Fluids Vessel T-8120	8820	gal	8,760	FLARE-003
FLARE-003	FLARE-003	Produced Fluids Vessel Flare	41	MMBtu/hr	8,760	--
L1	L1	Liquid Loading	420000	gal/yr	8,760	--
HTR-1	HTR-1	Fuel Gas Heater	1	MMBtu/hr	8,760	--
HTR-2	HTR-2	Fuel Gas Heater	0.75	MMBtu/hr	8,760	--
HTR-3	HTR-3	#1 Suction Condensate Heater	0.006	MMBtu/hr	8,760	--
HTR-4	HTR-4	#2 Suction Condensate Heater	0.006	MMBtu/hr	8,760	--
EG-001	EG-001	Capstone C200 Microturbine	0.2	MW/unit	8,760	--
EG-002	EG-002	Capstone C200 Microturbine	0.2	MW/unit	8,760	--
EG-003	EG-003	Capstone C200 Microturbine	0.2	MW/unit	8,760	--
EG-004	EG-004	Capstone C200 Microturbine	0.2	MW/unit	8,760	--
EG-005	EG-005	Capstone C200 Microturbine	0.2	MW/unit	8,760	--
T-003	T-003	Engine Lube Oil Tank	2000	gal	8,760	--
T-004	T-004	Compressor Lube Oil Tank	2000	gal	8,760	--
T-005	T-005	New MEG Storage Tank	2000	gal	8,760	--
T-006	T-006	Used MEG Storage Tank	2000	gal	8,760	--
T-007	T-007	Used Oil Storage Tank	4200	gal	8,760	--
T-009	T-009	Engine Lube Oil Storage Tank	302	gal	8,760	--
T-010	T-010	Engine Lube Oil Storage Tank	302	gal	8,760	--
T-011	T-011	Engine Lube Oil Storage Tank	302	gal	8,760	--
T-012	T-012	Engine Lube Oil Storage Tank	302	gal	8,760	--
T-013	T-013	Compressor Lube Oil Storage Tank	302	gal	8,760	--
T-014	T-014	Compressor Lube Oil Storage Tank	302	gal	8,760	--
T-015	T-015	Compressor Lube Oil Storage Tank	302	gal	8,760	--
T-016	T-016	Compressor Lube Oil Storage Tank	302	gal	8,760	--
T-023	T-023	New TEG Stroage Tank	2000	gal	8,760	--
T-024	T-024	Used TEG Storage Tank	2000	gal	8,760	--
ROAD	ROAD	Haul Roads	512	VMT/yr	8,760	--
FUG	FUG	Fugitive Equipment Leaks, Rod Packing, Pigging, and Pneumatics	--		8760	--
BLD	BLD	Blowdowns	--		8760	--

Civil & Environmental Consultants, Inc.

SUBJECT	PTE Calculations - Emission Summary	PROJECT NO.	334-808
PROJECT	EQM Gathering OPCO, LLC - Janus Compressor Station	SHEET	2
	Doddridge County, West Virginia		
MADE BY:	ZMS DATE: 3/5/2024	CHECKED BY: AMH	DATE: 3/5/2024

Hourly Emissions (lb/hr)

Pollutant	Caterpillar G3616 4SLB Compressor Engines	Glycol Dehydration Units Flash Tanks and Still Columns	Glycol Dehydration Unit Reboilers	Glycol Dehydration Unit Flares	Produced Fluids Tanks	Produced Fluids Tanks Flares	Liquids Loading	Fuel Gas Heater	Fuel Gas Heater	Suction Condensate Heaters	Capstone C200 Microturbines	Miscellaneous Storage Tanks	Haul Roads	Fugitive Emissions	Blowdowns	Total
	ENG001-ENG004	DEHY-001 - DEHY-002	RB-001 - RB-002	FLARE-001 - FLARE-002	T-001 - T-002	FLARE-003	L1	HTR-1	HTR-2	HTR-3 - HTR-4	EG-001 - EG-005	T-003 - T-024	ROAD	FUG	BLD	
Nitrogen Oxides	22.05	0.00	0.25	1.16	--	3.36	--	0.08	0.06	0.00	0.40	--	--	--	--	27.36
Carbon Monoxide	7.62	0.00	0.21	0.97	--	2.83	--	0.07	0.05	0.00	1.10	--	--	--	--	12.85
VOC	15.71	2.14	0.01	0.06	0.40	0.19	0.15	0.00	0.00	0.00	0.10	0.00	--	18.50	3,099.37	3,136.63
Sulfur Dioxide	0.09	--	0.00	0.01	--	0.02	--	0.00	0.00	0.00	0.04	--	--	--	--	0.15
Lead	--	--	0.00	0.00	--	0.00	--	0.00	0.00	0.00	--	--	--	--	--	0.00
PM	1.47	--	0.02	0.26	--	0.77	--	0.01	0.00	0.00	0.08	--	0.22	--	--	2.83
PM_{10}	1.47	--	0.02	0.09	--	0.26	--	0.01	0.00	0.00	0.08	--	0.06	--	--	1.98
$PM_{2.5}$	1.47	--	0.02	0.09	--	0.26	--	0.01	0.00	0.00	0.08	--	0.01	--	--	1.93
Methane	98.77	1.37	0.01	0.03	0.06	0.08	0.00	0.00	0.00	0.00	0.03	--	--	78.60	13,167.78	13,346.72
CO_2e	21,703.19	39.57	296.35	1,400.75	1.64	4,061.97	0.00	98.78	74.09	1.19	1,331.38	--	--	1,965.30	329,264.14	360,238.32
Formaldehyde	0.88	--	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.01	--	--	--	--	0.89
Benzene	0.06	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	--	0.03	4.30	4.62
Toluene	0.06	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	--	0.03	4.37	4.75
Ethylbenzene	0.01	0.02	--	--	0.00	--	0.00	--	--	--	0.00	--	--	0.00	0.25	0.27
Xylenes	0.03	0.13	--	--	0.00	--	0.00	--	--	--	0.00	--	--	0.01	1.27	1.44
n-Hexane	0.16	0.02	0.00	0.02	0.07	0.06	0.04	0.00	0.00	0.00	--	--	--	0.13	21.22	21.73
Total HAPs	3.75	0.68	0.00	0.02	0.08	0.06	0.04	0.00	0.00	0.00	0.01	0.00	--	0.22	36.49	41.36

Annual Emissions (ton/yr)

Pollutant	Caterpillar G3616 4SLB Compressor Engines	Glycol Dehydration Units Flash Tanks and Still Columns	Glycol Dehydration Unit Reboilers	Glycol Dehydration Unit Flares	Produced Fluids Tanks	Produced Fluids Tanks Flares	Liquids Loading	Fuel Gas Heater	Fuel Gas Heater	Suction Condensate Heaters	Capstone C200 Microturbines	Miscellaneous Storage Tanks	Haul Roads	Fugitive Emissions	Blowdowns	Total
	ENG001-ENG004	DEHY-001 - DEHY-002	RB-001 - RB-002	FLARE-001 - FLARE-002	T-001 - T-002	FLARE-003	L1	HTR-1	HTR-2	HTR-3 - HTR-4	EG-001 - EG-005	T-003 - T-024	ROAD	FUG	BLD	
Nitrogen Oxides	96.56	0.00	1.08	5.08	--	14.74	--	0.36	0.27	0.00	1.75	--	--	--	--	119.84
Carbon Monoxide	33.39	0.00	0.90	4.27	--	12.38	--	0.30	0.23	0.00	4.82	--	--	--	--	56.29
VOC	68.81	9.36	0.06	0.28	1.76	0.81	0.64	0.02	0.01	0.00	0.44	0.00	--	19.41	13.34	114.95
Sulfur Dioxide	0.38	--	0.01	0.03	--	0.09	--	0.00	0.00	0.00	0.16	--	--	--	--	0.67
Lead	--	--	0.00	0.00	--	0.00	--	0.00	0.00	0.00	--	--	--	--	--	0.00011
PM	6.46	--	0.08	1.16	--	3.36	--	0.03	0.02	0.00	0.33	--	0.94	--	--	12.38
PM_{10}	6.46	--	0.08	0.39	--	1.12	--	0.03	0.02	0.00	0.33	--	0.27	--	--	8.69
$PM_{2.5}$	6.46	--	0.08	0.39	--	1.12	--	0.03	0.02	0.00	0.33	--	0.03	--	--	8.45
Methane	432.60	6.01	0.02	0.12	0.28	0.34	0.00	0.01	0.01	0.00	0.11	--	--	82.48	56.67	578.65
CO_2e	95,059.96	173.30	1,298.01	6,135.27	7.18	17,791.41	0.00	432.67	324.50	5.19	5,831.43	--	--	2,062.35	1,417.10	130,538.38
Formaldehyde	3.86	--	0.00	0.00	--	0.01	--	0.00	0.00	0.00	0.04	--	--	--	--	3.91
Benzene	0.28	0.96	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	--	--	0.03	0.02	1.31
Toluene	0.26	1.27	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.01	--	--	0.03	0.02	1.61
Ethylbenzene	0.03	0.07	--	--	0.00	--	0.00	--	--	--	0.00	--	--	0.00	0.00	0.10
Xylenes	0.12	0.57	--	--	0.00	--	0.00	--	--	--	0.00	--	--	0.01	0.01	0.71
n-Hexane	0.72	0.09	0.02	0.09	0.32	0.27	0.16	0.01	0.00	0.00	--	--	--	0.13	0.09	1.91
Total HAPs	16.40	2.98	0.02	0.10	0.36	0.28	0.18	0.01	0.01	0.00	0.05	0.00	--	0.23	0.16	20.77

Civil & Environmental Consultants, Inc.

SUBJECT	PTE Calculations - Caterpillar G3616 4SLB Compressor Engines			PROJECT NO.	334-808
PROJECT	EQM Gathering OPCO, LLC - Janus Compressor Station			SHEET	3
	Doddridge County, West Virginia				
MADE BY:	ZMS	DATE: 1/18/2024	CHECKED BY: AMH	DATE:	1/19/2024

Assumptions:

Operating Schedule	8,760 hr/yr
Design Capacity	5,000 bhp
Number of Generator Engines	4 Compressor(s)
Fuel Consumption	7,382 Btu/bhp-hr

Controlled Emissions

Pollutant	Emission Factor[1]		Hourly Emission Rate[2] (lb/hr)	Annual Emission Rate[2] (ton/yr)
Nitrogen Oxides[3]	0.50	g/bhp-hr	22.05	96.56
Carbon Monoxide[3]	0.17	g/bhp-hr	7.62	33.39
Sulfur Dioxide	5.88E-04	lb/MMBtu	0.09	0.38
PM[7]	9.99E-03	lb/MMBtu	1.47	6.46
PM_{10}	9.99E-03	lb/MMBtu	1.47	6.46
$PM_{2.5}$	9.99E-03	lb/MMBtu	1.47	6.46
VOC (Total Hydrocarbons)[3]	3.56E-01	g/bhp-hr	15.71	68.81
Carbon Dioxide[3]	436.00	g/bhp-hr	19,224.31	84,202.47
Methane[3]	2.24	g/bhp-hr	98.77	432.60
Nitrous Oxide[5]	1.00E-04	kg/MMBtu	0.03	0.14
CO_2e[6]	--	--	21,703.19	95,059.96
1,1,2,2-Tetrachloroethane	4.00E-05	lb/MMBtu	0.01	2.59E-02
1,1,2-Trichloroethane	3.18E-05	lb/MMBtu	0.00	2.06E-02
1,1-Dichloroethane	2.36E-05	lb/MMBtu	0.00	1.53E-02
1,2,3-Trimethylbenzene	2.30E-05	lb/MMBtu	0.00	1.49E-02
1,2,4-Trimethylbenzene	1.43E-05	lb/MMBtu	0.00	9.25E-03
1,2-Dichloroethane	2.36E-05	lb/MMBtu	0.00	1.53E-02
1,2-Dichloropropane	2.69E-05	lb/MMBtu	0.00	1.74E-02
1,3,5-Trimethylbenzene	3.38E-05	lb/MMBtu	0.00	2.19E-02
1,3-Butadiene	2.67E-04	lb/MMBtu	0.04	1.73E-01
1,3-Dichloropropene	2.64E-05	lb/MMBtu	0.00	1.71E-02
2-Methylnaphthalene	3.32E-05	lb/MMBtu	0.00	2.15E-02
2,2,4-Trimethylpentane	2.50E-04	lb/MMBtu	0.04	1.62E-01
Acenaphthene	1.25E-06	lb/MMBtu	0.00	8.08E-04
Acenaphthylene	5.53E-06	lb/MMBtu	0.00	3.58E-03
Acetaldehyde	8.36E-03	lb/MMBtu	1.23	5.41E+00
Acrolein	5.14E-03	lb/MMBtu	0.76	3.32E+00
Benzene	4.40E-04	lb/MMBtu	0.06	2.85E-01
Benzo(b)fluoranthene	1.66E-07	lb/MMBtu	0.00	1.07E-04
Benzo(e)pyrene	4.15E-07	lb/MMBtu	0.00	2.68E-04
Benzo(g,h,i)perylene	4.14E-07	lb/MMBtu	0.00	2.68E-04
Biphenyl	2.12E-04	lb/MMBtu	0.03	1.37E-01
Butane	5.41E-04	lb/MMBtu	0.08	3.50E-01
Butyr/Isobutyraldehyde	1.01E-04	lb/MMBtu	0.01	6.53E-02
Carbon Tetrachloride	3.67E-05	lb/MMBtu	0.01	2.37E-02
Chlorobenzene	3.04E-05	lb/MMBtu	0.00	1.97E-02
Chloroethane	1.87E-06	lb/MMBtu	0.00	1.21E-03
Chloroform	2.85E-05	lb/MMBtu	0.00	1.84E-02
Chrysene	6.93E-07	lb/MMBtu	0.00	4.48E-04
Cyclopentane	2.27E-04	lb/MMBtu	0.03	1.47E-01
Ethane	1.05E-01	lb/MMBtu	15.50	6.79E+01
Ethylbenzene	3.97E-05	lb/MMBtu	0.01	2.57E-02
Ethylene Dibromide	4.43E-05	lb/MMBtu	0.01	2.86E-02
Fluoranthene	1.11E-06	lb/MMBtu	0.00	7.18E-04
Fluorene	5.67E-06	lb/MMBtu	0.00	3.67E-03
Formaldehyde[3]	2.00E-02	g/bhp-hr	0.88	3.86
Methanol	2.50E-03	lb/MMBtu	0.37	1.62E+00
Methylcyclohexane	1.23E-03	lb/MMBtu	0.18	7.95E-01
Methylene Chloride	2.00E-05	lb/MMBtu	0.00	1.29E-02
n-Hexane	1.11E-03	lb/MMBtu	0.16	7.18E-01
n-Nonane	1.10E-04	lb/MMBtu	0.02	7.11E-02
n-Octane	3.51E-04	lb/MMBtu	0.05	2.27E-01
n-Pentane	2.60E-03	lb/MMBtu	0.38	1.68E+00
Naphthalene	7.44E-05	lb/MMBtu	0.01	4.81E-02
PAH	2.69E-05	lb/MMBtu	0.00	1.74E-02
Phenanthrene	1.04E-05	lb/MMBtu	0.00	6.73E-03
Phenol	2.40E-05	lb/MMBtu	0.00	1.55E-02
Propane	4.19E-02	lb/MMBtu	6.19	2.71E+01
Pyrene	1.36E-06	lb/MMBtu	0.00	8.79E-04
Styrene	2.36E-05	lb/MMBtu	0.00	1.53E-02
Tetrachloroethane	2.48E-06	lb/MMBtu	0.00	1.60E-03
Toluene	4.08E-04	lb/MMBtu	0.06	2.64E-01
Vinyl Chloride	1.49E-05	lb/MMBtu	0.00	9.64E-03
Xylenes	1.84E-04	lb/MMBtu	0.03	1.19E-01
Total HAPs	--	--	3.75E+00	16.40

Notes

[1] U.S. EPA AP-42, Ch. 3.2, Table 3.2-2 Emission Factors for 4-Stroke Lean-Burn Engines. Unless otherwise noted.

[2] Emissions are total of all compressor engines.

[3] Emission factor from manufacturer specifications for engine operating at full load.

[4] 40 CFR 98, Subpart C, Table C-1.

[5] 40 CFR 98, Subpart C, Table C-2.

[6] CO_2e emissions are comprised of Carbon Dioxide (GWP of 1), Methane (GWP of 25), and Nitrous Oxide (GWP of 298).

[7] Conservativley assume PM = PM_{10} = $PM_{2.5}$.

Civil & Environmental Consultants, Inc.					
SUBJECT	PTE Calculations - Glycol Dehydrators with Flash Tanks			PROJECT NO.	334-808
PROJECT	EQM Gathering OPCO, LLC - Janus Compressor Station			SHEET	4
	Doddridge County, West Virginia				
MADE BY:	ZMS	DATE: 1/10/2024	CHECKED BY: AMH	DATE:	1/16/2024

Assumptions, GLYCalc Inputs:

Gas Production	152.0	MMscf/day
Dehydrator Count	2	Dehydrator(s)
Operating Schedule	8760	hr/yr
Gas Temperature	75	°F
Gas Pressure	1200	psig
Design Capacity	152	MMScf/day
Recirculation Rate	18.8	gal/min
Flash Tank Temperature	135	°F
Flash Tank Pressure	35	psig
Enclosed Combustor Capacity	7	MMBtu/hr

	Gas Analysis	GLYCalc Output[1]			Combustion Emissions[2]			Total Emissions		
Component	Weight %	(lb/hr)	(lb/day)	(ton/yr)	lb/hr	lb/day	ton/yr	(lb/hr)	(lb/day)	(ton/yr)
Nitrogen Oxides	--	--	--	--	--	--	--	0.00	0.00	0.00
Carbon Monoxide	--	--	--	--	--	--	--	0.00	0.00	0.00
Hydrogen Sulfide	--	--	--	--	--	--	--	0.00	0.00	0.00
Nitrogen	0.0073	--	--	--	--	--	--	0.00	0.00	0.00
Carbon Dioxide	0.0034	2.6400	63.3600	11.5632	--	--	--	5.28	126.72	23.13
Methane	0.6338	0.6857	16.4580	3.0035	--	--	--	1.37	32.92	6.01
Nitrous Oxide	--	--	--	--	--	--	--	0.00	0.00	0.00
CO_2e[3]	--	--	--	--	--	--	--	39.57	949.62	173.30
Ethane	0.2063	0.6097	14.6340	2.6707	--	--	--	1.22	29.27	5.34
Propane	0.0854	0.3332	7.9970	1.4595	--	--	--	0.67	15.99	2.92
Iso-Butane	0.0145	0.0707	1.6970	0.3098	--	--	--	0.14	3.39	0.62
n-Butane	0.0265	0.1692	4.0610	0.7411	--	--	--	0.34	8.12	1.48
Iso-Pentane	0.0083	0.0462	1.1080	0.2022	--	--	--	0.09	2.22	0.40
n-Pentane	0.0074	0.0537	1.2890	0.2352	--	--	--	0.11	2.58	0.47
Cyclopentane	--	--	--	--	--	--	--	0.00	0.00	0.00
Other Hexanes	0.0044	0.0359	0.8610	0.1571	--	--	--	0.07	1.72	0.31
n-Hexane	0.0010	0.0107	0.2570	0.0468	--	--	--	0.02	0.51	0.09
Cyclohexane	--	--	--	--				0.00	0.00	0.00
Heptane	0.0006	0.0093	0.2240	0.0409	--	--	--	0.02	0.45	0.08
2,2,4-Trimethylpentane	0.0002	0.0016	0.0380	0.0069	--	--	--	0.00	0.08	0.01
Octanes	0.0004	0.0094	0.2260	0.0413	--	--	--	0.02	0.45	0.08
Undecanes	--	--	--	--	--	--	--	0.00	0.00	0.00
Dodecanes	--	--	--	--	--	--	--	0.00	0.00	0.00
Benzene	0.0002	0.1095	2.6290	0.4798	--	--	--	0.22	5.26	0.96
Toluene	0.0002	0.1454	3.4910	0.6370	--	--	--	0.29	6.98	1.27
Ethylbenzene	0.0000	0.0079	0.1890	0.0345	--	--	--	0.02	0.38	0.07
Xylenes	0.0001	0.0654	1.5700	0.2864	--	--	--	0.13	3.14	0.57
Hydrocarbons	0.9893	2.3636	56.7270	10.3526	--	--	--	4.73	113.45	20.71
Total VOC	0.1492	1.0681	25.6350	4.6784	--	--	--	2.14	51.27	9.36
Total HAP	0.0018	0.3405	8.1720	1.4915	--	--	--	0.68	16.34	2.98

Notes

[1] Emissions per dehydrator, calculated using GRI-GLYCalc 4.0.

[2] Additional products of combustion are from the enclosed combustor. Combustion emissions from the enclosed combustors are accounted for in the Dehy Flares section of the calculations, using AP-42 Chapter 1.4 Natural Gas Combustion

[3] CO_2e emissions are comprised of Carbon Dioxide (GWP of 1), Methane (GWP of 25) and Nitrous Oxide (GWP of 298).

Civil & Environmental Consultants, Inc.					
SUBJECT	PTE Calculations - Enclosed Combustor			PROJECT NO.	334-808
PROJECT	EQM Gathering OPCO, LLC - Janus Compressor Station			SHEET	5
	Doddridge County, West Virginia				
MADE BY:	ZMS	DATE: 1/12/2024	CHECKED BY: AMH	DATE:	1/16/2024

Assumptions:

Operating Schedule	8,760	hr/yr
Design Capacity	7.0000	MMBtu/hr
Number of Enclosed Combustors	2	Flare(s)
Gas Heat Content (HHV)[1]	1,222	Btu/scf

Pollutant	Emission Factor[2] (lb/MMscf)	Hourly Emission Rate[3] (lb/hr)	Annual Emission Rate[3] (ton/yr)
Nitrogen Oxides	1.00E+02	1.15	5.02
Carbon Monoxide	8.40E+01	0.96	4.22
VOC	5.50E+00	0.06	0.28
Sulfur Dioxide	6.00E-01	0.01	0.03
PM	7.60E+00	0.09	0.38
PM_{10}[4]	--	0.09	0.38
$PM_{2.5}$[4]	--	0.09	0.38
Lead	5.00E-04	0.00	0.00
Carbon Dioxide	1.20E+05	1,374.80	6,021.60
Methane	2.30E+00	0.03	0.12
Nitrous Oxide	2.20E+00	0.03	0.11
CO_2e[5]	--	1,382.97	6,057.39
2-Methylnaphthalene	2.40E-05	2.75E-07	1.20E-06
3-Methylcholanthrene	1.80E-06	2.06E-08	9.03E-08
7,12-Dimethylbenz(a)anthracene	1.60E-05	1.83E-07	8.03E-07
Acenaphthene	1.80E-06	2.06E-08	9.03E-08
Acenaphthylene	1.80E-06	2.06E-08	9.03E-08
Anthracene	2.40E-06	2.75E-08	1.20E-07
Benz(a)anthracene	1.80E-06	2.06E-08	9.03E-08
Benzene	2.10E-03	2.41E-05	1.05E-04
Benzo(a)pyrene	1.20E-06	1.37E-08	6.02E-08
Benzo(b)fluoranthene	1.80E-06	2.06E-08	9.03E-08
Benzo(g,h,i)perylene	1.20E-06	1.37E-08	6.02E-08
Benzo(k)fluoranthene	1.80E-06	2.06E-08	9.03E-08
Chrysene	1.80E-06	2.06E-08	9.03E-08
Dibenzo(a,h)anthracene	1.20E-06	1.37E-08	6.02E-08
Dichlorobenzene	1.20E-03	1.37E-05	6.02E-05
Fluoranthene	3.00E-06	3.44E-08	1.51E-07
Fluorene	2.80E-06	3.21E-08	1.41E-07
Formaldehyde	7.50E-02	8.59E-04	3.76E-03
n-Hexane	1.80E+00	2.06E-02	9.03E-02
Indeno(1,2,3-cd)pyrene	1.80E-06	2.06E-08	9.03E-08
Naphthalene	6.10E-04	6.99E-06	3.06E-05
Phenanthrene	1.70E-05	1.95E-07	8.53E-07
Pyrene	5.00E-06	5.73E-08	2.51E-07
Toluene	3.40E-03	3.90E-05	1.71E-04
Arsenic	2.00E-04	2.29E-06	1.00E-05
Beryllium	1.20E-05	1.37E-07	6.02E-07
Cadmium	1.10E-03	1.26E-05	5.52E-05
Chromium	1.40E-03	1.60E-05	7.03E-05
Cobalt	8.40E-05	9.62E-07	4.22E-06
Manganese	3.80E-04	4.35E-06	1.91E-05
Mercury	2.60E-04	2.98E-06	1.30E-05
Nickel	2.10E-03	2.41E-05	1.05E-04
Selenium	2.40E-05	2.75E-07	1.20E-06
Total HAPs	--	0.02	0.09

Notes

[1] Gas Heat content is based on the gas analysis for the site.

[2] U. S. EPA, AP-42 Chapter 1.4 Natural Gas Combustion, Tables 1.4-1 through 4, July 1998.

[3] Emissions are total of all combustors.

[4] PM_{10} and $PM_{2.5}$ factors are not available. Conservatively, PM = PM_{10} = $PM_{2.5}$.

[5] CO_2e emissions are comprised of Carbon Dioxide (GWP of 1), Methane (GWP of 25), and Nitrous Oxide (GWP of 298).

Civil & Environmental Consultants, Inc.					
SUBJECT	PTE Calculations - Dehydrator Flare Pilots			PROJECT NO.	334-808
PROJECT	EQM Gathering OPCO, LLC - Janus Compressor Station			SHEET	6
	Doddridge County, West Virginia				
MADE BY:	ZMS	DATE: 1/16/2024	CHECKED BY: AMH	DATE:	1/19/2024

Assumptions:

Operating Schedule	8,760	hr/yr
Design Capacity	0.0900	MMBtu/hr
Number of Pilots	2	Pilot(s)
Gas Heat Content (HHV)[1]	1,222	Btu/scf

Pollutant	Emission Factor[2] (lb/MMscf)	Hourly Emission Rate[3] (lb/hr)	Annual Emission Rate[3] (ton/yr)
Nitrogen Oxides	1.00E+02	0.01	0.06
Carbon Monoxide	8.40E+01	0.01	0.05
VOC	5.50E+00	0.00	0.00
Sulfur Dioxide	6.00E-01	0.00	0.00
PM	7.60E+00	0.00	0.00
PM_{10}[4]	--	0.00	0.00
$PM_{2.5}$[4]	--	0.00	0.00
Lead	5.00E-04	0.00	0.00
Carbon Dioxide	1.20E+05	17.68	77.42
Methane	2.30E+00	0.00	0.00
Nitrous Oxide	2.20E+00	0.00	0.00
CO_2e[5]	--	17.78	77.88
2-Methylnaphthalene	2.40E-05	3.54E-09	1.55E-08
3-Methylcholanthrene	1.80E-06	2.65E-10	1.16E-09
7,12-Dimethylbenz(a)anthracene	1.60E-05	2.36E-09	1.03E-08
Acenaphthene	1.80E-06	2.65E-10	1.16E-09
Acenaphthylene	1.80E-06	2.65E-10	1.16E-09
Anthracene	2.40E-06	3.54E-10	1.55E-09
Benz(a)anthracene	1.80E-06	2.65E-10	1.16E-09
Benzene	2.10E-03	3.09E-07	1.35E-06
Benzo(a)pyrene	1.20E-06	1.77E-10	7.74E-10
Benzo(b)fluoranthene	1.80E-06	2.65E-10	1.16E-09
Benzo(g,h,i)perylene	1.20E-06	1.77E-10	7.74E-10
Benzo(k)fluoranthene	1.80E-06	2.65E-10	1.16E-09
Chrysene	1.80E-06	2.65E-10	1.16E-09
Dibenzo(a,h)anthracene	1.20E-06	1.77E-10	7.74E-10
Dichlorobenzene	1.20E-03	1.77E-07	7.74E-07
Fluoranthene	3.00E-06	4.42E-10	1.94E-09
Fluorene	2.80E-06	4.12E-10	1.81E-09
Formaldehyde	7.50E-02	1.10E-05	4.84E-05
n-Hexane	1.80E+00	2.65E-04	1.16E-03
Indeno(1,2,3-cd)pyrene	1.80E-06	2.65E-10	1.16E-09
Naphthalene	6.10E-04	8.99E-08	3.94E-07
Phenanthrene	1.70E-05	2.50E-09	1.10E-08
Pyrene	5.00E-06	7.36E-10	3.23E-09
Toluene	3.40E-03	5.01E-07	2.19E-06
Arsenic	2.00E-04	2.95E-08	1.29E-07
Beryllium	1.20E-05	1.77E-09	7.74E-09
Cadmium	1.10E-03	1.62E-07	7.10E-07
Chromium	1.40E-03	2.06E-07	9.03E-07
Cobalt	8.40E-05	1.24E-08	5.42E-08
Manganese	3.80E-04	5.60E-08	2.45E-07
Mercury	2.60E-04	3.83E-08	1.68E-07
Nickel	2.10E-03	3.09E-07	1.35E-06
Selenium	2.40E-05	3.54E-09	1.55E-08
Total HAPs	--	0.00	0.00

Notes

[1] Gas Heat content is based on the gas analysis for the site.

[2] U. S. EPA, AP-42 Chapter 1.4 Natural Gas Combustion, Tables 1.4-1 through 4, July 1998.

[3] Emissions are total of all combustors.

[4] PM_{10} and $PM_{2.5}$ factors are not available. Conservatively, PM = PM_{10} = $PM_{2.5}$.

[5] CO_2e emissions are comprised of Carbon Dioxide (GWP of 1), Methane (GWP of 25), and Nitrous Oxide (GWP of 298).

Civil & Environmental Consultants, Inc.					
SUBJECT	PTE Calculations - Tank Flares			PROJECT NO.	334-808
PROJECT	EQM Gathering OPCO, LLC - Janus Compressor Station			SHEET	7
	Doddridge County, West Virginia				
MADE BY:	ZMS	DATE: 1/16/2024	CHECKED BY: AMH	DATE:	1/19/2024

Assumptions:

Operating Schedule	8,760 hr/yr
Design Capacity	41.0000 MMBtu/hr
Number of Enclosed Combustors	1 Flare(s)
Gas Heat Content (HHV)[1]	1,222 Btu/scf

Pollutant	Emission Factor[2] (lb/MMscf)	Hourly Emission Rate[3] (lb/hr)	Annual Emission Rate[3] (ton/yr)
Nitrogen Oxides	1.00E+02	3.36	14.70
Carbon Monoxide	8.40E+01	2.82	12.34
VOC	5.50E+00	0.18	0.81
Sulfur Dioxide	6.00E-01	0.02	0.09
PM	7.60E+00	0.25	1.12
PM_{10}[4]	--	0.25	1.12
$PM_{2.5}$[4]	--	0.25	1.12
Lead	5.00E-04	0.00	0.00
Carbon Dioxide	1.20E+05	4,026.19	17,634.70
Methane	2.30E+00	0.08	0.34
Nitrous Oxide	2.20E+00	0.07	0.32
CO_2e[5]	--	4,050.11	17,739.49
2-Methylnaphthalene	2.40E-05	8.05E-07	3.53E-06
3-Methylcholanthrene	1.80E-06	6.04E-08	2.65E-07
7,12-Dimethylbenz(a)anthracene	1.60E-05	5.37E-07	2.35E-06
Acenaphthene	1.80E-06	6.04E-08	2.65E-07
Acenaphthylene	1.80E-06	6.04E-08	2.65E-07
Anthracene	2.40E-06	8.05E-08	3.53E-07
Benz(a)anthracene	1.80E-06	6.04E-08	2.65E-07
Benzene	2.10E-03	7.05E-05	3.09E-04
Benzo(a)pyrene	1.20E-06	4.03E-08	1.76E-07
Benzo(b)fluoranthene	1.80E-06	6.04E-08	2.65E-07
Benzo(g,h,i)perylene	1.20E-06	4.03E-08	1.76E-07
Benzo(k)fluoranthene	1.80E-06	6.04E-08	2.65E-07
Chrysene	1.80E-06	6.04E-08	2.65E-07
Dibenzo(a,h)anthracene	1.20E-06	4.03E-08	1.76E-07
Dichlorobenzene	1.20E-03	4.03E-05	1.76E-04
Fluoranthene	3.00E-06	1.01E-07	4.41E-07
Fluorene	2.80E-06	9.39E-08	4.11E-07
Formaldehyde	7.50E-02	2.52E-03	1.10E-02
n-Hexane	1.80E+00	6.04E-02	2.65E-01
Indeno(1,2,3-cd)pyrene	1.80E-06	6.04E-08	2.65E-07
Naphthalene	6.10E-04	2.05E-05	8.96E-05
Phenanthrene	1.70E-05	5.70E-07	2.50E-06
Pyrene	5.00E-06	1.68E-07	7.35E-07
Toluene	3.40E-03	1.14E-04	5.00E-04
Arsenic	2.00E-04	6.71E-06	2.94E-05
Beryllium	1.20E-05	4.03E-07	1.76E-06
Cadmium	1.10E-03	3.69E-05	1.62E-04
Chromium	1.40E-03	4.70E-05	2.06E-04
Cobalt	8.40E-05	2.82E-06	1.23E-05
Manganese	3.80E-04	1.27E-05	5.58E-05
Mercury	2.60E-04	8.72E-06	3.82E-05
Nickel	2.10E-03	7.05E-05	3.09E-04
Selenium	2.40E-05	8.05E-07	3.53E-06
Total HAPs	--	0.06	0.28

Notes

[1] Gas Heat content is based on the gas analysis for the site.

[2] U. S. EPA, AP-42 Chapter 1.4 Natural Gas Combustion, Tables 1.4-1 through 4, July 1998.

[3] Emissions are total of all combustors.

[4] PM_{10} and $PM_{2.5}$ factors are not available. Conservatively, PM = PM_{10} = $PM_{2.5}$.

[5] CO_2e emissions are comprised of Carbon Dioxide (GWP of 1), Methane (GWP of 25), and Nitrous Oxide (GWP of 298).

Civil & Environmental Consultants, Inc.					
SUBJECT	PTE Calculations - Tank Flare Pilots			PROJECT NO.	334-808
PROJECT	EQM Gathering OPCO, LLC - Janus Compressor Station			SHEET	8
	Doddridge County, West Virginia				
MADE BY:	ZMS	DATE: 1/16/2024	CHECKED BY: AMH	DATE:	1/19/2024

Assumptions:

Operating Schedule	8,760	hr/yr
Design Capacity	0.1200	MMBtu/hr
Number of Pilots	1	Pilot(s)
Gas Heat Content (HHV)[1]	1,222	Btu/scf

Pollutant	Emission Factor[2] (lb/MMscf)	Hourly Emission Rate[3] (lb/hr)	Annual Emission Rate[3] (ton/yr)
Nitrogen Oxides	1.00E+02	0.01	0.04
Carbon Monoxide	8.40E+01	0.01	0.04
VOC	5.50E+00	0.00	0.00
Sulfur Dioxide	6.00E-01	0.00	0.00
PM	7.60E+00	0.00	0.00
PM_{10}[4]	--	0.00	0.00
$PM_{2.5}$[4]	--	0.00	0.00
Lead	5.00E-04	0.00	0.00
Carbon Dioxide	1.20E+05	11.78	51.61
Methane	2.30E+00	0.00	0.00
Nitrous Oxide	2.20E+00	0.00	0.00
CO_2e[5]	--	11.85	51.92
2-Methylnaphthalene	2.40E-05	2.36E-09	1.03E-08
3-Methylcholanthrene	1.80E-06	1.77E-10	7.74E-10
7,12-Dimethylbenz(a)anthracene	1.60E-05	1.57E-09	6.88E-09
Acenaphthene	1.80E-06	1.77E-10	7.74E-10
Acenaphthylene	1.80E-06	1.77E-10	7.74E-10
Anthracene	2.40E-06	2.36E-10	1.03E-09
Benz(a)anthracene	1.80E-06	1.77E-10	7.74E-10
Benzene	2.10E-03	2.06E-07	9.03E-07
Benzo(a)pyrene	1.20E-06	1.18E-10	5.16E-10
Benzo(b)fluoranthene	1.80E-06	1.77E-10	7.74E-10
Benzo(g,h,i)perylene	1.20E-06	1.18E-10	5.16E-10
Benzo(k)fluoranthene	1.80E-06	1.77E-10	7.74E-10
Chrysene	1.80E-06	1.77E-10	7.74E-10
Dibenzo(a,h)anthracene	1.20E-06	1.18E-10	5.16E-10
Dichlorobenzene	1.20E-03	1.18E-07	5.16E-07
Fluoranthene	3.00E-06	2.95E-10	1.29E-09
Fluorene	2.80E-06	2.75E-10	1.20E-09
Formaldehyde	7.50E-02	7.36E-06	3.23E-05
n-Hexane	1.80E+00	1.77E-04	7.74E-04
Indeno(1,2,3-cd)pyrene	1.80E-06	1.77E-10	7.74E-10
Naphthalene	6.10E-04	5.99E-08	2.62E-07
Phenanthrene	1.70E-05	1.67E-09	7.31E-09
Pyrene	5.00E-06	4.91E-10	2.15E-09
Toluene	3.40E-03	3.34E-07	1.46E-06
Arsenic	2.00E-04	1.96E-08	8.60E-08
Beryllium	1.20E-05	1.18E-09	5.16E-09
Cadmium	1.10E-03	1.08E-07	4.73E-07
Chromium	1.40E-03	1.37E-07	6.02E-07
Cobalt	8.40E-05	8.25E-09	3.61E-08
Manganese	3.80E-04	3.73E-08	1.63E-07
Mercury	2.60E-04	2.55E-08	1.12E-07
Nickel	2.10E-03	2.06E-07	9.03E-07
Selenium	2.40E-05	2.36E-09	1.03E-08
Total HAPs	--	0.00	0.00

Notes

[1] Gas Heat content is based on the gas analysis for the site.

[2] U. S. EPA, AP-42 Chapter 1.4 Natural Gas Combustion, Tables 1.4-1 through 4, July 1998.

[3] Emissions are total of all combustors.

[4] PM_{10} and $PM_{2.5}$ factors are not available. Conservatively, PM = PM_{10} = $PM_{2.5}$.

[5] CO_2e emissions are comprised of Carbon Dioxide (GWP of 1), Methane (GWP of 25), and Nitrous Oxide (GWP of 298).

Civil & Environmental Consultants, Inc.

SUBJECT	PTE Calculations - Reboilers			PROJECT NO.	334-808
PROJECT	EQM Gathering OPCO, LLC - Janus Compressor Station			SHEET	9
	Doddridge County, West Virginia				
MADE BY:	ZMS	DATE: 1/12/2024	CHECKED BY: AMH	DATE:	1/16/2024

Assumptions:

Operating Schedule	8,760	hr/yr
Design Capacity	1.5	MMBtu/hr
Number of Reboilers	2	Reboiler(s)
Gas HHV[1]	1222	Btu/scf

Pollutant	Emission Factor[2] (lb/MMscf)	Emission Factor (lb/MMBtu)	Hourly Emission Rate[3] (lb/hr)	Annual Emission Rate[3] (ton/yr)
Nitrogen Oxides	100	0.08	0.25	1.08
Carbon Monoxide	84	0.07	0.21	0.90
VOC	5.5	0.00	0.01	0.06
Sulfur Dioxide	0.6	0.00	0.00	0.01
Lead	0.0005	0.00	0.00	0.00
PM	7.6	0.01	0.02	0.08
PM_{10}	7.6	0.01	0.02	0.08
$PM_{2.5}$	7.6	0.01	0.02	0.08
Carbon Dioxide	120000	98.20	294.60	1,290.34
Methane	2.3	0.00	0.01	0.02
Nitrous Oxide	2.2	0.00	0.01	0.02
CO_2e[4]	--	--	296.35	1,298.01
2-Methylnaphthalene	2.40E-05	1.96E-08	5.89E-08	2.58E-07
3-Methylcholanthrene	1.80E-06	1.47E-09	4.42E-09	1.94E-08
7,12-Dimethylbenz(a)anthracene	1.60E-05	1.31E-08	3.93E-08	1.72E-07
Acenaphthene	1.80E-06	1.47E-09	4.42E-09	1.94E-08
Acenaphthylene	1.80E-06	1.47E-09	4.42E-09	1.94E-08
Anthracene	2.40E-06	1.96E-09	5.89E-09	2.58E-08
Benz(a)anthracene	1.80E-06	1.47E-09	4.42E-09	1.94E-08
Benzene	2.10E-03	1.72E-06	5.16E-06	2.26E-05
Benzo(a)pyrene	1.20E-06	9.82E-10	2.95E-09	1.29E-08
Benzo(b)fluoranthene	1.80E-06	1.47E-09	4.42E-09	1.94E-08
Benzo(g,h,i)perylene	1.20E-06	9.82E-10	2.95E-09	1.29E-08
Benzo(k)fluoranthene	1.80E-06	1.47E-09	4.42E-09	1.94E-08
Butane	2.10E+00	1.72E-03	5.16E-03	2.26E-02
Chrysene	1.80E-06	1.47E-09	4.42E-09	1.94E-08
Dibenzo(a,h)anthracene	1.20E-06	9.82E-10	2.95E-09	1.29E-08
Dichlorobenzene	1.20E-03	9.82E-07	2.95E-06	1.29E-05
Ethane	3.10E+00	2.54E-03	7.61E-03	3.33E-02
Fluoranthene	3.00E-06	2.45E-09	7.36E-09	3.23E-08
Fluorene	2.80E-06	2.29E-09	6.87E-09	3.01E-08
Formaldehyde	7.50E-02	6.14E-05	1.84E-04	8.06E-04
n-Hexane	1.80E+00	1.47E-03	4.42E-03	1.94E-02
Indeno(1,2,3-cd)pyrene	1.80E-06	1.47E-09	4.42E-09	1.94E-08
Naphthalene	6.10E-04	4.99E-07	1.50E-06	6.56E-06
Pentane	2.60E+00	2.13E-03	6.38E-03	2.80E-02
Phenanthrene	1.70E-05	1.39E-08	4.17E-08	1.83E-07
Propane	1.60E+00	1.31E-03	3.93E-03	1.72E-02
Pyrene	5.00E-06	4.09E-09	1.23E-08	5.38E-08
Toluene	3.40E-03	2.78E-06	8.35E-06	3.66E-05
Arsenic	2.00E-04	1.64E-07	4.91E-07	2.15E-06
Barium	4.40E-03	3.60E-06	1.08E-05	4.73E-05
Beryllium	1.20E-05	9.82E-09	2.95E-08	1.29E-07
Cadmium	1.10E-03	9.00E-07	2.70E-06	1.18E-05
Chromium	1.40E-03	1.15E-06	3.44E-06	1.51E-05
Cobalt	8.40E-05	6.87E-08	2.06E-07	9.03E-07
Copper	8.50E-04	6.96E-07	2.09E-06	9.14E-06
Manganese	3.80E-04	3.11E-07	9.33E-07	4.09E-06
Mercury	2.60E-04	2.13E-07	6.38E-07	2.80E-06
Molybdenum	1.10E-03	9.00E-07	2.70E-06	1.18E-05
Nickel	2.10E-03	1.72E-06	5.16E-06	2.26E-05
Selenium	2.40E-05	1.96E-08	5.89E-08	2.58E-07
Vanadium	2.30E-03	1.88E-06	5.65E-06	2.47E-05
Zinc	2.90E-02	2.37E-05	7.12E-05	3.12E-04
Total POM[5]	--	--	2.17E-07	9.48E-07
Total HAPs	--	--	4.63E-03	2.03E-02

Notes

[1] Gas Heat content is based on the gas analysis for the site.

[2] U.S. EPA AP-42 Ch. 1.4. Tables 1.4-1, 1.4-2, 1.4-3, 1.4-4 Emission Factors for Nitrogen Oxides, Carbon Monoxide, Criteria Pollutants and Speciated Organic Compounds from Natural Gas Combustion; uncontrolled, small boilers (<100 MMBtu/hr).

[3] Emissions are total of all Reboilers.

[4] CO_2e emissions are comprised of Carbon Dioxide (GWP of 1), Methane (GWP of 25), and Nitrous Oxide (GWP of 298).

[5] Total POM includes all PAH and PAH derivatives.

Civil & Environmental Consultants, Inc.

SUBJECT	PTE Calculations - Fuel Gas Heater 1			PROJECT NO.	334-808
PROJECT	EQM Gathering OPCO, LLC - Janus Compressor Station			SHEET	10
	Doddridge County, West Virginia				
MADE BY:	ZMS	DATE: 1/12/2024	CHECKED BY: AMH	DATE:	1/16/2024

Assumptions:

Operating Schedule	8,760	hr/yr
Design Capacity	1	MMBtu/hr
Number of Heaters	1	Heater(s)
Gas HHV[1]	1222	Btu/scf

Pollutant	Emission Factor[2] (lb/MMscf)	Emission Factor (lb/MMBtu)	Hourly Emission Rate[3] (lb/hr)	Annual Emission Rate[3] (ton/yr)
Nitrogen Oxides	100	0.08	0.08	0.36
Carbon Monoxide	84	0.07	0.07	0.30
VOC	5.5	0.00	0.00	0.02
Sulfur Dioxide	0.6	0.00	0.00	0.00
Lead	0.0005	0.00	0.00	0.00
PM	7.6	0.01	0.01	0.03
PM_{10}	7.6	0.01	0.01	0.03
$PM_{2.5}$	7.6	0.01	0.01	0.03
Carbon Dioxide	120000	98.20	98.20	430.11
Methane	2.3	0.00	0.00	0.01
Nitrous Oxide	2.2	0.00	0.00	0.01
CO_2e[4]	--	--	98.78	432.67
2-Methylnaphthalene	2.40E-05	1.96E-08	1.96E-08	8.60E-08
3-Methylcholanthrene	1.80E-06	1.47E-09	1.47E-09	6.45E-09
7,12-Dimethylbenz(a)anthracene	1.60E-05	1.31E-08	1.31E-08	5.73E-08
Acenaphthene	1.80E-06	1.47E-09	1.47E-09	6.45E-09
Acenaphthylene	1.80E-06	1.47E-09	1.47E-09	6.45E-09
Anthracene	2.40E-06	1.96E-09	1.96E-09	8.60E-09
Benz(a)anthracene	1.80E-06	1.47E-09	1.47E-09	6.45E-09
Benzene	2.10E-03	1.72E-06	1.72E-06	7.53E-06
Benzo(a)pyrene	1.20E-06	9.82E-10	9.82E-10	4.30E-09
Benzo(b)fluoranthene	1.80E-06	1.47E-09	1.47E-09	6.45E-09
Benzo(g,h,i)perylene	1.20E-06	9.82E-10	9.82E-10	4.30E-09
Benzo(k)fluoranthene	1.80E-06	1.47E-09	1.47E-09	6.45E-09
Butane	2.10E+00	1.72E-03	1.72E-03	7.53E-03
Chrysene	1.80E-06	1.47E-09	1.47E-09	6.45E-09
Dibenzo(a,h)anthracene	1.20E-06	9.82E-10	9.82E-10	4.30E-09
Dichlorobenzene	1.20E-03	9.82E-07	9.82E-07	4.30E-06
Ethane	3.10E+00	2.54E-03	2.54E-03	1.11E-02
Fluoranthene	3.00E-06	2.45E-09	2.45E-09	1.08E-08
Fluorene	2.80E-06	2.29E-09	2.29E-09	1.00E-08
Formaldehyde	7.50E-02	6.14E-05	6.14E-05	2.69E-04
n-Hexane	1.80E+00	1.47E-03	1.47E-03	6.45E-03
Indeno(1,2,3-cd)pyrene	1.80E-06	1.47E-09	1.47E-09	6.45E-09
Naphthalene	6.10E-04	4.99E-07	4.99E-07	2.19E-06
Pentane	2.60E+00	2.13E-03	2.13E-03	9.32E-03
Phenanthrene	1.70E-05	1.39E-08	1.39E-08	6.09E-08
Propane	1.60E+00	1.31E-03	1.31E-03	5.73E-03
Pyrene	5.00E-06	4.09E-09	4.09E-09	1.79E-08
Toluene	3.40E-03	2.78E-06	2.78E-06	1.22E-05
Arsenic	2.00E-04	1.64E-07	1.64E-07	7.17E-07
Barium	4.40E-03	3.60E-06	3.60E-06	1.58E-05
Beryllium	1.20E-05	9.82E-09	9.82E-09	4.30E-08
Cadmium	1.10E-03	9.00E-07	9.00E-07	3.94E-06
Chromium	1.40E-03	1.15E-06	1.15E-06	5.02E-06
Cobalt	8.40E-05	6.87E-08	6.87E-08	3.01E-07
Copper	8.50E-04	6.96E-07	6.96E-07	3.05E-06
Manganese	3.80E-04	3.11E-07	3.11E-07	1.36E-06
Mercury	2.60E-04	2.13E-07	2.13E-07	9.32E-07
Molybdenum	1.10E-03	9.00E-07	9.00E-07	3.94E-06
Nickel	2.10E-03	1.72E-06	1.72E-06	7.53E-06
Selenium	2.40E-05	1.96E-08	1.96E-08	8.60E-08
Vanadium	2.30E-03	1.88E-06	1.88E-06	8.24E-06
Zinc	2.90E-02	2.37E-05	2.37E-05	1.04E-04
Total POM[5]	--	--	7.22E-08	3.16E-07
Total HAPs	--	--	1.54E-03	6.77E-03

Notes

[1] Gas Heat content is based on the gas analysis for the site.

[2] U.S. EPA AP-42 Ch. 1.4. Tables 1.4-1, 1.4-2, 1.4-3, 1.4-4 Emission Factors for Nitrogen Oxides, Carbon Monoxide, Criteria Pollutants and Speciated Organic Compounds from Natural Gas Combustion; uncontrolled, small boilers (<100 MMBtu/hr).

[3] Emissions are total of all Reboilers.

[4] CO_2e emissions are comprised of Carbon Dioxide (GWP of 1), Methane (GWP of 25), and Nitrous Oxide (GWP of 298).

[5] Total POM includes all PAH and PAH derivatives.

Civil & Environmental Consultants, Inc.

SUBJECT	PTE Calculations - Fuel Gas Heater 2			PROJECT NO.	334-808
PROJECT	EQM Gathering OPCO, LLC - Janus Compressor Station			SHEET	11
	Doddridge County, West Virginia				
MADE BY:	ZMS	DATE: 1/12/2024	CHECKED BY: AMH	DATE:	1/16/2024

Assumptions:

Operating Schedule	8,760 hr/yr
Design Capacity	0.75 MMBtu/hr
Number of Heaters	1 Heater(s)
Gas HHV[1]	1222 Btu/scf

Pollutant	Emission Factor[2] (lb/MMscf)	Emission Factor (lb/MMBtu)	Hourly Emission Rate[3] (lb/hr)	Annual Emission Rate[3] (ton/yr)
Nitrogen Oxides	100	0.08	0.06	0.27
Carbon Monoxide	84	0.07	0.05	0.23
VOC	5.5	0.00	0.00	0.01
Sulfur Dioxide	0.6	0.00	0.00	0.00
Lead	0.0005	0.00	0.00	0.00
PM	7.6	0.01	0.00	0.02
PM_{10}	7.6	0.01	0.00	0.02
$PM_{2.5}$	7.6	0.01	0.00	0.02
Carbon Dioxide	120000	98.20	73.65	322.59
Methane	2.3	0.00	0.00	0.01
Nitrous Oxide	2.2	0.00	0.00	0.01
CO_2e[4]	--	--	74.09	324.50
2-Methylnaphthalene	2.40E-05	1.96E-08	1.47E-08	6.45E-08
3-Methylcholanthrene	1.80E-06	1.47E-09	1.10E-09	4.84E-09
7,12-Dimethylbenz(a)anthracene	1.60E-05	1.31E-08	9.82E-09	4.30E-08
Acenaphthene	1.80E-06	1.47E-09	1.10E-09	4.84E-09
Acenaphthylene	1.80E-06	1.47E-09	1.10E-09	4.84E-09
Anthracene	2.40E-06	1.96E-09	1.47E-09	6.45E-09
Benz(a)anthracene	1.80E-06	1.47E-09	1.10E-09	4.84E-09
Benzene	2.10E-03	1.72E-06	1.29E-06	5.65E-06
Benzo(a)pyrene	1.20E-06	9.82E-10	7.36E-10	3.23E-09
Benzo(b)fluoranthene	1.80E-06	1.47E-09	1.10E-09	4.84E-09
Benzo(g,h,i)perylene	1.20E-06	9.82E-10	7.36E-10	3.23E-09
Benzo(k)fluoranthene	1.80E-06	1.47E-09	1.10E-09	4.84E-09
Butane	2.10E+00	1.72E-03	1.29E-03	5.65E-03
Chrysene	1.80E-06	1.47E-09	1.10E-09	4.84E-09
Dibenzo(a,h)anthracene	1.20E-06	9.82E-10	7.36E-10	3.23E-09
Dichlorobenzene	1.20E-03	9.82E-07	7.36E-07	3.23E-06
Ethane	3.10E+00	2.54E-03	1.90E-03	8.33E-03
Fluoranthene	3.00E-06	2.45E-09	1.84E-09	8.06E-09
Fluorene	2.80E-06	2.29E-09	1.72E-09	7.53E-09
Formaldehyde	7.50E-02	6.14E-05	4.60E-05	2.02E-04
n-Hexane	1.80E+00	1.47E-03	1.10E-03	4.84E-03
Indeno(1,2,3-cd)pyrene	1.80E-06	1.47E-09	1.10E-09	4.84E-09
Naphthalene	6.10E-04	4.99E-07	3.74E-07	1.64E-06
Pentane	2.60E+00	2.13E-03	1.60E-03	6.99E-03
Phenanthrene	1.70E-05	1.39E-08	1.04E-08	4.57E-08
Propane	1.60E+00	1.31E-03	9.82E-04	4.30E-03
Pyrene	5.00E-06	4.09E-09	3.07E-09	1.34E-08
Toluene	3.40E-03	2.78E-06	2.09E-06	9.14E-06
Arsenic	2.00E-04	1.64E-07	1.23E-07	5.38E-07
Barium	4.40E-03	3.60E-06	2.70E-06	1.18E-05
Beryllium	1.20E-05	9.82E-09	7.36E-09	3.23E-08
Cadmium	1.10E-03	9.00E-07	6.75E-07	2.96E-06
Chromium	1.40E-03	1.15E-06	8.59E-07	3.76E-06
Cobalt	8.40E-05	6.87E-08	5.16E-08	2.26E-07
Copper	8.50E-04	6.96E-07	5.22E-07	2.28E-06
Manganese	3.80E-04	3.11E-07	2.33E-07	1.02E-06
Mercury	2.60E-04	2.13E-07	1.60E-07	6.99E-07
Molybdenum	1.10E-03	9.00E-07	6.75E-07	2.96E-06
Nickel	2.10E-03	1.72E-06	1.29E-06	5.65E-06
Selenium	2.40E-05	1.96E-08	1.47E-08	6.45E-08
Vanadium	2.30E-03	1.88E-06	1.41E-06	6.18E-06
Zinc	2.90E-02	2.37E-05	1.78E-05	7.80E-05
Total POM[5]	--	--	5.41E-08	2.37E-07
Total HAPs	--	--	1.16E-03	5.08E-03

Notes

[1] Gas Heat content is based on the gas analysis for the site.

[2] U.S. EPA AP-42 Ch. 1.4. Tables 1.4-1, 1.4-2, 1.4-3, 1.4-4 Emission Factors for Nitrogen Oxides, Carbon Monoxide, Criteria Pollutants and Speciated Organic Compounds from Natural Gas Combustion; uncontrolled, small boilers (<100 MMBtu/hr).

[3] Emissions are total of all Reboilers.

[4] CO_2e emissions are comprised of Carbon Dioxide (GWP of 1), Methane (GWP of 25), and Nitrous Oxide (GWP of 298).

[5] Total POM includes all PAH and PAH derivatives.

Civil & Environmental Consultants, Inc.

SUBJECT	PTE Calculations -Suction Condensate Heaters			PROJECT NO.	334-808
PROJECT	EQM Gathering OPCO, LLC - Janus Compressor Station			SHEET	12
	Doddridge County, West Virginia				
MADE BY:	ZMS	DATE: 1/12/2024	CHECKED BY: AMH	DATE:	1/16/2024

Assumptions:

Operating Schedule	8,760 hr/yr
Design Capacity	0.006 MMBtu/hr
Number of Heaters	2 Heater(s)
Gas HHV[1]	1222 Btu/scf

Pollutant	Emission Factor[2] (lb/MMscf)	Emission Factor (lb/MMBtu)	Hourly Emission Rate[3] (lb/hr)	Annual Emission Rate[3] (ton/yr)
Nitrogen Oxides	100	0.08	0.00	0.00
Carbon Monoxide	84	0.07	0.00	0.00
VOC	5.5	0.00	0.00	0.00
Sulfur Dioxide	0.6	0.00	0.00	0.00
Lead	0.0005	0.00	0.00	0.00
PM	7.6	0.01	0.00	0.00
PM_{10}	7.6	0.01	0.00	0.00
$PM_{2.5}$	7.6	0.01	0.00	0.00
Carbon Dioxide	120000	98.20	1.18	5.16
Methane	2.3	0.00	0.00	0.00
Nitrous Oxide	2.2	0.00	0.00	0.00
CO_2e[4]	--	--	1.19	5.19
2-Methylnaphthalene	2.40E-05	1.96E-08	2.36E-10	1.03E-09
3-Methylcholanthrene	1.80E-06	1.47E-09	1.77E-11	7.74E-11
7,12-Dimethylbenz(a)anthracene	1.60E-05	1.31E-08	1.57E-10	6.88E-10
Acenaphthene	1.80E-06	1.47E-09	1.77E-11	7.74E-11
Acenaphthylene	1.80E-06	1.47E-09	1.77E-11	7.74E-11
Anthracene	2.40E-06	1.96E-09	2.36E-11	1.03E-10
Benz(a)anthracene	1.80E-06	1.47E-09	1.77E-11	7.74E-11
Benzene	2.10E-03	1.72E-06	2.06E-08	9.03E-08
Benzo(a)pyrene	1.20E-06	9.82E-10	1.18E-11	5.16E-11
Benzo(b)fluoranthene	1.80E-06	1.47E-09	1.77E-11	7.74E-11
Benzo(g,h,i)perylene	1.20E-06	9.82E-10	1.18E-11	5.16E-11
Benzo(k)fluoranthene	1.80E-06	1.47E-09	1.77E-11	7.74E-11
Butane	2.10E+00	1.72E-03	2.06E-05	9.03E-05
Chrysene	1.80E-06	1.47E-09	1.77E-11	7.74E-11
Dibenzo(a,h)anthracene	1.20E-06	9.82E-10	1.18E-11	5.16E-11
Dichlorobenzene	1.20E-03	9.82E-07	1.18E-08	5.16E-08
Ethane	3.10E+00	2.54E-03	3.04E-05	1.33E-04
Fluoranthene	3.00E-06	2.45E-09	2.95E-11	1.29E-10
Fluorene	2.80E-06	2.29E-09	2.75E-11	1.20E-10
Formaldehyde	7.50E-02	6.14E-05	7.36E-07	3.23E-06
n-Hexane	1.80E+00	1.47E-03	1.77E-05	7.74E-05
Indeno(1,2,3-cd)pyrene	1.80E-06	1.47E-09	1.77E-11	7.74E-11
Naphthalene	6.10E-04	4.99E-07	5.99E-09	2.62E-08
Pentane	2.60E+00	2.13E-03	2.55E-05	1.12E-04
Phenanthrene	1.70E-05	1.39E-08	1.67E-10	7.31E-10
Propane	1.60E+00	1.31E-03	1.57E-05	6.88E-05
Pyrene	5.00E-06	4.09E-09	4.91E-11	2.15E-10
Toluene	3.40E-03	2.78E-06	3.34E-08	1.46E-07
Arsenic	2.00E-04	1.64E-07	1.96E-09	8.60E-09
Barium	4.40E-03	3.60E-06	4.32E-08	1.89E-07
Beryllium	1.20E-05	9.82E-09	1.18E-10	5.16E-10
Cadmium	1.10E-03	9.00E-07	1.08E-08	4.73E-08
Chromium	1.40E-03	1.15E-06	1.37E-08	6.02E-08
Cobalt	8.40E-05	6.87E-08	8.25E-10	3.61E-09
Copper	8.50E-04	6.96E-07	8.35E-09	3.66E-08
Manganese	3.80E-04	3.11E-07	3.73E-09	1.63E-08
Mercury	2.60E-04	2.13E-07	2.55E-09	1.12E-08
Molybdenum	1.10E-03	9.00E-07	1.08E-08	4.73E-08
Nickel	2.10E-03	1.72E-06	2.06E-08	9.03E-08
Selenium	2.40E-05	1.96E-08	2.36E-10	1.03E-09
Vanadium	2.30E-03	1.88E-06	2.26E-08	9.89E-08
Zinc	2.90E-02	2.37E-05	2.85E-07	1.25E-06
Total POM[5]	--	--	8.66E-10	3.79E-09
Total HAPs	--	--	1.85E-05	8.12E-05

Notes

[1] Gas Heat content is based on the gas analysis for the site.

[2] U.S. EPA AP-42 Ch. 1.4. Tables 1.4-1, 1.4-2, 1.4-3, 1.4-4 Emission Factors for Nitrogen Oxides, Carbon Monoxide, Criteria Pollutants and Speciated Organic Compounds from Natural Gas Combustion; uncontrolled, small boilers (<100 MMBtu/hr).

[3] Emissions are total of all Reboilers.

[4] CO_2e emissions are comprised of Carbon Dioxide (GWP of 1), Methane (GWP of 25), and Nitrous Oxide (GWP of 298).

[5] Total POM includes all PAH and PAH derivatives.

Civil & Environmental Consultants, Inc.

SUBJECT	PTE Calculations - Capstone C200 Microturbines			PROJECT NO.	334-808
PROJECT	EQM Gathering OPCO, LLC - Janus Compressor Station			SHEET	13
	Doddridge County, West Virginia				
MADE BY:	ZMS	DATE: 1/18/2024	CHECKED BY: AMH	DATE:	1/19/2024

Assumptions:

Operating Schedule	8,760	hr/yr
Design Capacity	5,000	bhp
Number of Microturbines	5	Microturbine(s)
Rated Electrical Power Output	0.2	MW/unit
Fuel HHV	1,222	Btu/scf
Maximum Fuel Consumption	1,860	scf/hr/unit
Heat Input	2.28	MMBtu/hr/unit

Controlled Emissions

Pollutant	Emission Factor[1]		Hourly Emission Rate[2] (lb/hr)	Annual Emission Rate[2] (ton/yr)
Nitrogen Oxides[3]	0.40	lb/Mwhe	0.40	1.75
Carbon Monoxide[3]	1.10	lb/Mwhe	1.10	4.82
Sulfur Dioxide	3.20E-03	lb/MMBtu	0.04	0.16
PM[7]	6.60E-03	lb/MMBtu	0.08	0.33
PM_{10}[7]	6.60E-03	lb/MMBtu	0.08	0.33
$PM_{2.5}$[7]	6.60E-03	lb/MMBtu	0.08	0.33
VOC (Total Hydrocarbons)[3]	1.00E-01	lb/Mwhe	0.10	0.44
Carbon Dioxide[3]	1,330.00	lb/Mwhe	1,330.00	5,825.40
Methane[5]	0.001	kg/MMBtu	0.03	0.11
Nitrous Oxide[5]	1.00E-04	kg/MMBtu	0.00	0.01
CO_2e[6]	--	--	1,331.38	5,831.43
1,3-Butadiene	4.30E-07	lb/MMBtu	4.90E-06	2.15E-05
Acetaldehyde	4.00E-05	lb/MMBtu	4.56E-04	2.00E-03
Acrolein	6.40E-06	lb/MMBtu	7.30E-05	3.20E-04
Benzene	1.20E-05	lb/MMBtu	1.37E-04	5.99E-04
Propylene Oxide	2.90E-05	lb/MMBtu	3.31E-04	1.45E-03
Ethylbenzene	3.20E-05	lb/MMBtu	3.65E-04	1.60E-03
Formaldehyde	7.10E-04	lb/MMBtu	8.09E-03	3.55E-02
Naphthalene	1.30E-06	lb/MMBtu	1.48E-05	6.49E-05
PAH	2.20E-06	lb/MMBtu	2.51E-05	1.10E-04
Toluene	1.30E-04	lb/MMBtu	1.48E-03	6.49E-03
Xylenes	6.40E-05	lb/MMBtu	7.30E-04	3.20E-03
Total HAPs	--	--	0.01	0.05

Notes

[1] U.S. EPA AP-42, Ch. 3.1, Table 3.1-2a and 3.1-3 Emission Factors for Natural Gas-Fired Stationary Gas Turbines. Unless otherwise noted.

[2] Emissions are total of all generators.

[3] Emission factor from manufacturer specifications for turbine operating at full capacity.

[4] 40 CFR 98, Subpart C, Table C-1.

[5] 40 CFR 98, Subpart C, Table C-2.

[6] CO_2e emissions are comprised of Carbon Dioxide (GWP of 1), Methane (GWP of 25), and Nitrous Oxide (GWP of 298).

[7] Conservativley assume PM = PM_{10} = $PM_{2.5}$.

Civil & Environmental Consultants, Inc.						
SUBJECT	PTE Calculations - Produced Fluids Tanks				PROJECT NO.	334-808
PROJECT	EQM Gathering OPCO, LLC - Janus Compressor Station				SHEET	14
	Doddridge County, West Virginia					
MADE BY:	ZMS	DATE:	1/18/2024	CHECKED BY: AMH	DATE:	1/19/2024

Assumptions, ProMax Inputs:

Tank Contents	Produced Water/Condensate	
Operating Schedule	8760	hr/yr
Tank Count	2	Tank(s)
Single Tank Capacity	8820	gal
Single Tank Diameter	10.00	ft
Single Tank Length	15.01	ft
Input Pressure	245.696	psig
Input Temperature	69.6	°F
Outlet Pressure	0.0	psig
Outlet Temperature	0.0	°F
Throughput	420,000	gal/yr
	210000	bbl/yr/tank
Produced Water Throughput	378000	gal/yr
Condensate Throughput	42000	gal/yr
Tanks Flare Control Efficiency	95%	
Flare Loading Control Efficiency	0%	

Uncontrolled Emissions (ProMax)

Pollutant	Working & Breathing Emissions for all Tanks		Flashing Emissions for all Tanks		Overall Emissions for all Tanks		Loading Emissions	
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
Nitrogen	1.24E-05	5.41E-05	5.15E-03	2.25E-02	5.16E-03	2.26E-02	0.00E+00	0.00E+00
Carbon Dioxide	1.70E-03	7.46E-03	3.01E-02	1.32E-01	3.18E-02	1.39E-01	0.00E+00	0.00E+00
Methane	9.75E-03	4.27E-02	1.28E+00	5.59E+00	1.29E+00	5.63E+00	0.00E+00	0.00E+00
Ethane	8.10E-02	3.55E-01	1.86E+00	8.14E+00	1.94E+00	8.50E+00	0.00E+00	0.00E+00
Propane	2.45E-01	1.07E+00	2.02E+00	8.83E+00	2.26E+00	9.90E+00	1.18E-02	5.15E-02
Iso-Butane	7.62E-02	3.34E-01	6.43E-01	2.82E+00	7.19E-01	3.15E+00	1.40E-02	6.15E-02
n-Butane	1.76E-01	7.70E-01	1.50E+00	6.57E+00	1.68E+00	7.34E+00	3.73E-02	1.63E-01
Iso-Pentane	7.84E-02	3.43E-01	6.84E-01	3.00E+00	7.62E-01	3.34E+00	1.89E-02	8.28E-02
n-Pentane	7.77E-02	3.40E-01	6.85E-01	3.00E+00	7.62E-01	3.34E+00	1.91E-02	8.35E-02
NeoPentane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
n-Hexane	1.45E-01	6.34E-01	1.32E+00	5.80E+00	1.47E+00	6.43E+00	3.66E-02	1.60E-01
Heptane	1.23E-02	5.39E-02	1.16E-01	5.08E-01	1.28E-01	5.62E-01	3.09E-03	1.35E-02
2,2,4-Trimethylpentane	5.56E-03	2.43E-02	5.19E-02	2.27E-01	5.75E-02	2.52E-01	1.40E-03	6.14E-03
Octanes	7.75E-03	3.39E-02	7.54E-02	3.30E-01	8.31E-02	3.64E-01	1.92E-03	8.42E-03
Benzene	5.58E-03	2.44E-02	5.06E-02	2.21E-01	5.61E-02	2.46E-01	1.40E-03	6.13E-03
Toluene	4.82E-03	2.11E-02	4.53E-02	1.98E-01	5.01E-02	2.20E-01	1.20E-03	5.27E-03
Ethylbenzene	2.06E-04	9.02E-04	2.00E-03	8.76E-03	2.21E-03	9.66E-03	5.08E-05	2.23E-04
Xylenes	1.08E-03	4.72E-03	1.05E-02	4.60E-02	1.16E-02	5.07E-02	2.65E-04	1.16E-03
Water	1.02E-02	4.48E-02	1.00E-01	4.40E-01	1.11E-01	4.85E-01	2.49E-03	1.09E-02
VOC	0.00E+00	3.66	7.20	31.55	8.04	35.21	0.15	0.64
Total HAPs	0.00E+00	0.71	1.48	6.50	1.65	7.21	0.04	0.18
CO_2e[1]	0.00E+00	1.07	31.93	139.83	32.17	140.91	0.00	0.00

Controlled Emissions

Pollutant	Working & Breathing Emissions for all		Flashing Emissions for all Tanks		Overall Emissions for all		Loading Emissions	
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
Nitrogen	1.24E-05	5.41E-05	5.15E-03	2.25E-02	5.16E-03	2.26E-02	0.00E+00	0.00E+00
Carbon Dioxide	1.70E-03	7.46E-03	3.01E-02	1.32E-01	3.18E-02	1.39E-01	0.00E+00	0.00E+00
Methane	4.87E-04	2.13E-03	6.38E-02	2.79E-01	6.43E-02	2.82E-01	0.00E+00	0.00E+00
Ethane	4.05E-03	1.77E-02	9.30E-02	4.07E-01	9.70E-02	4.25E-01	0.00E+00	0.00E+00
Propane	1.22E-02	5.36E-02	1.01E-01	4.41E-01	1.13E-01	4.95E-01	1.18E-02	5.15E-02
Iso-Butane	3.81E-03	1.67E-02	3.22E-02	1.41E-01	3.60E-02	1.58E-01	1.40E-02	6.15E-02
n-Butane	8.79E-03	3.85E-02	7.50E-02	3.29E-01	8.38E-02	3.67E-01	3.73E-02	1.63E-01
Iso-Pentane	3.92E-03	1.72E-02	3.42E-02	1.50E-01	3.81E-02	1.67E-01	1.89E-02	8.28E-02
n-Pentane	3.88E-03	1.70E-02	3.42E-02	1.50E-01	3.81E-02	1.67E-01	1.91E-02	8.35E-02
NeoPentane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
n-Hexane	7.24E-03	3.17E-02	6.62E-02	2.90E-01	7.35E-02	3.22E-01	3.66E-02	1.60E-01
Heptane	6.15E-04	2.70E-03	5.80E-03	2.54E-02	6.41E-03	2.81E-02	3.09E-03	1.35E-02
2,2,4-Trimethylpentane	2.78E-04	1.22E-03	2.60E-03	1.14E-02	2.87E-03	1.26E-02	1.40E-03	6.14E-03
Octanes	3.87E-04	1.70E-03	3.77E-03	1.65E-02	4.16E-03	1.82E-02	1.92E-03	8.42E-03
Benzene	2.79E-04	1.22E-03	2.53E-03	1.11E-02	2.81E-03	1.23E-02	1.40E-03	6.13E-03
Toluene	2.41E-04	1.06E-03	2.26E-03	9.92E-03	2.51E-03	1.10E-02	1.20E-03	5.27E-03
Ethylbenzene	1.03E-05	4.51E-05	1.00E-04	4.38E-04	1.10E-04	4.83E-04	5.08E-05	2.23E-04
Xylenes	5.38E-05	2.36E-04	5.25E-04	2.30E-03	5.79E-04	2.54E-03	2.65E-04	1.16E-03
Water	1.02E-02	4.48E-02	1.00E-01	4.40E-01	1.11E-01	4.85E-01	2.49E-03	1.09E-02
VOC	0.04	0.18	0.36	1.58	0.40	1.76	0.15	0.64
Total HAPs	0.01	0.04	0.07	0.33	0.08	0.36	0.04	0.18
CO_2e[1]	0.01	0.06	1.62	7.12	1.64	7.18	0.00	0.00

Notes

[1] CO_2e emissions are comprised of Carbon Dioxide (GWP of 1) and Methane (GWP of 25).

Civil & Environmental Consultants, Inc.					
SUBJECT	PTE Calculations - Engine Lube Oil Tank T-003			PROJECT NO.	334-808
PROJECT	EQM Gathering OPCO, LLC - Janus Compressor Station			SHEET	15
	Doddridge County, West Virginia				
MADE BY:	ZMS	DATE: 1/11/2024	CHECKED BY: AMH	DATE:	1/11/2024

Assumptions:

Tank Contents	Lube Oil	
Operating Schedule	8760	hr/yr
Tank Count	1	Tank(s)
Single Tank Capacity	2000	gal
Single Tank Diameter	5.33	ft
Single Tank Length	11.97	ft
Input Pressure	0	psig
Input Temperature	52.1	°F
Outlet Pressure	0	psig
Outlet Temperature	52	°F
Throughput	4,200	gal/yr

Engine Lube Oil Emissions (ProMax)

Pollutant	Working & Breathing Emissions for all Tanks		Flashing Emissions for all Tanks		Overall Emissions for all Tanks	
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
VOC	1.52E-06	6.66E-06	0.00E+00	0.00E+00	1.52E-06	6.66E-06
Total HAPs	1.52E-06	6.66E-06	0.00E+00	0.00E+00	1.52E-06	6.66E-06

Civil & Environmental Consultants, Inc.

SUBJECT	PTE Calculations - Compressor Lube Oil Tank T-004			PROJECT NO.	334-808
PROJECT	EQM Gathering OPCO, LLC - Janus Compressor Station			SHEET	16
	Doddridge County, West Virginia				
MADE BY:	ZMS	DATE: 1/11/2024	CHECKED BY: AMH	DATE:	1/11/2024

Assumptions:

Tank Contents	Lube Oil	
Operating Schedule	8760	hr/yr
Tank Count	1	Tank(s)
Single Tank Capacity	2000	gal
Single Tank Diameter	5.33	ft
Single Tank Length	11.97	ft
Input Pressure	0	psig
Input Temperature	52	°F
Outlet Pressure	0	psig
Outlet Temperature	52	°F
Throughput	7,266	gal/yr

Compressor Lube Oil Emissions (ProMax)

Pollutant	Working & Breathing Emissions for all Tanks		Flashing Emissions for all Tanks		Overall Emissions for all Tanks	
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
VOC	1.73E-06	7.56E-06	0.00E+00	0.00E+00	1.73E-06	7.56E-06
Total HAPs	1.73E-06	7.56E-06	0.00E+00	0.00E+00	1.73E-06	7.56E-06

Civil & Environmental Consultants, Inc.

SUBJECT	PTE Calculations - MEG Storage Tanks T-005-T-006	PROJECT NO.	334-808
PROJECT	EQM Gathering OPCO, LLC - Janus Compressor Station	SHEET	17
	Doddridge County, West Virginia		
MADE BY:	ZMS DATE: 1/18/2024 CHECKED BY: AMH	DATE:	1/19/2024

Assumptions:	New MEG Tank - T-005		Used MEG Tank T-006	
Tank Contents	Monoethylene Glycol		Monoethylene Glycol	
Operating Schedule	8760	hr/yr	8760	hr/yr
Tank Count	1	Tank(s)	1	Tank(s)
Single Tank Capacity	2000	gal	2000	gal
Single Tank Diameter	5.33	ft	5.33	ft
Single Tank Length	11.97	ft	11.97	ft
Input Pressure	0	psig	0	psig
Input Temperature	52	°F	52	°F
Outlet Pressure	0	psig	0	psig
Outlet Temperature	52	°F	52	°F
Throughput	1,050	gal/yr/tank	1,050	gal/yr/tank

MEG Emissions (ProMax)

Pollutant	**Working & Breathing Emissions for all Tanks**		**Flashing Emissions for all Tanks**		**Overall Emissions for all Tanks**	
	(lb/hr)	**(ton/yr)**	**(lb/hr)**	**(ton/yr)**	**(lb/hr)**	**(ton/yr)**
VOC	3.15E-06	1.38E-05	0.00E+00	0.00E+00	3.15E-06	1.38E-05
Total HAPs	3.15E-06	1.38E-05	0.00E+00	0.00E+00	3.15E-06	1.38E-05

Civil & Environmental Consultants, Inc.					
SUBJECT	PTE Calculations - Used Oil Storage Tank T-007			PROJECT NO.	334-808
PROJECT	EQM Gathering OPCO, LLC - Janus Compressor Station			SHEET	18
	Doddridge County, West Virginia				
MADE BY:	ZMS	DATE: 1/11/2024	CHECKED BY: AMH	DATE:	1/11/2024

Assumptions:

Tank Contents	Compressor Oil	
Operating Schedule	8760	hr/yr
Tank Count	1	Tank(s)
Single Tank Capacity	4200	gal
Single Tank Diameter	5.33	ft
Single Tank Length	25.13	ft
Input Pressure	0	psig
Input Temperature	52	°F
Outlet Pressure	0	psig
Outlet Temperature	52	°F
Throughput	4,200	gal/yr

Used Oil Emissions (ProMax)

Pollutant	Working & Breathing Emissions for all Tanks		Flashing Emissions for all Tanks		Overall Emissions for all Tanks	
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
VOC	3.48E-06	1.52E-05	0.00E+00	0.00E+00	3.48E-06	1.52E-05
Total HAPs	3.48E-06	1.52E-05	0.00E+00	0.00E+00	3.48E-06	1.52E-05

Civil & Environmental Consultants, Inc.

SUBJECT	PTE Calculations - Engine Lube Oil Tanks T-009-T-012			PROJECT NO.	334-808
PROJECT	EQM Gathering OPCO, LLC - Janus Compressor Station			SHEET	19
	Doddridge County, West Virginia				
MADE BY:	ZMS	DATE: 1/11/2024	CHECKED BY: AMH	DATE:	1/11/2024

Assumptions:

Tank Contents	Engine Lube Oil	
Operating Schedule	8760	hr/yr
Tank Count	4	Tank(s)
Single Tank Capacity	302	gal
Single Tank Diameter	3.17	ft
Single Tank Length	5.13	ft
Input Pressure	0	psig
Input Temperature	52	°F
Outlet Pressure	0	psig
Outlet Temperature	52	°F
Throughput	4,200	gal/yr

Engine Lube Oil Emissions (ProMax)

Pollutant	Working & Breathing Emissions for all Tanks		Flashing Emissions for all Tanks		Overall Emissions for all Tanks	
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
VOC	1.52E-06	6.64E-06	0.00E+00	0.00E+00	1.52E-06	6.64E-06
Total HAPs	1.52E-06	6.64E-06	0.00E+00	0.00E+00	1.52E-06	6.64E-06

Civil & Environmental Consultants, Inc.					
SUBJECT	PTE Calculations - Compressor Lube Oil Tanks T-013-T-016			PROJECT NO.	334-808
PROJECT	EQM Gathering OPCO, LLC - Janus Compressor Station			SHEET	20
	Doddridge County, West Virginia				
MADE BY:	ZMS	DATE: 1/11/2024	CHECKED BY: AMH	DATE:	1/12/2024

Assumptions:

Tank Contents	Compressor Lube Oil	
Operating Schedule	8760	hr/yr
Tank Count	4	Tank(s)
Single Tank Capacity	302	gal
Single Tank Diameter	3.17	ft
Single Tank Length	5.13	ft
Input Pressure	0	psig
Input Temperature	52	°F
Outlet Pressure	0	psig
Outlet Temperature	52	°F
Throughput	7,224	gal/yr

Compressor Lube Oil Emissions (ProMax)

Pollutant	Working & Breathing Emissions for all Tanks		Flashing Emissions for all Tanks		Overall Emissions for all Tanks	
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
VOC	1.76E-06	7.70E-06	0.00E+00	0.00E+00	1.76E-06	7.70E-06
Total HAPs	1.76E-06	7.70E-06	0.00E+00	0.00E+00	1.76E-06	7.70E-06

Civil & Environmental Consultants, Inc.

SUBJECT	PTE Calculations - New Triethylene Glycol Storage Tank			PROJECT NO.	334-808
PROJECT	EQM Gathering OPCO, LLC - Janus Compressor Station			SHEET	21
	Doddridge County, West Virginia				
MADE BY:	ZMS	DATE: 1/11/2024	CHECKED BY: AMH	DATE:	1/11/2024

Assumptions:

Tank Contents	TEG	
Operating Schedule	8760	hr/yr
Tank Count	1	Tank(s)
Single Tank Capacity	2000	gal
Single Tank Diameter	5.33	ft
Single Tank Length	11.97	ft
Input Pressure	0	psig
Input Temperature	52	°F
Outlet Pressure	0	psig
Outlet Temperature	52	°F
Throughput	4200	gal/yr

TEG Emissions (ProMax)

Pollutant	Working & Breathing Emissions for all Tanks		Flashing Emissions for all Tanks		Overall Emissions for all Tanks	
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
VOC	1.48E-08	6.49E-08	0.00E+00	0.00E+00	1.48E-08	6.49E-08
Total HAPs	1.48E-08	6.49E-08	0.00E+00	0.00E+00	1.48E-08	6.49E-08

Civil & Environmental Consultants, Inc.

SUBJECT	PTE Calculations - Used Triethylene Glycol Storage Tank			PROJECT NO.	334-808
PROJECT	EQM Gathering OPCO, LLC - Janus Compressor Station			SHEET	22
	Doddridge County, West Virginia				
MADE BY:	ZMS	DATE: 1/11/2024	CHECKED BY: AMH	DATE:	1/11/2024

Assumptions:

Tank Contents	TEG	
Operating Schedule	8760	hr/yr
Tank Count	1	Tank(s)
Single Tank Capacity	2000.00	gal
Single Tank Diameter	5.33	ft
Single Tank Length	25.13	ft
Input Pressure	0	psig
Input Temperature	52	°F
Outlet Pressure	0	psig
Outlet Temperature	52	°F
Throughput	4200	gal/yr

TEG Emissions (ProMax)

Pollutant	Working & Breathing Emissions for all Tanks		Flashing Emissions for all Tanks		Overall Emissions for all Tanks	
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
VOC	2.81E-08	1.23E-07	0.00E+00	0.00E+00	2.81E-08	1.23E-07
Total HAPs	2.81E-08	1.23E-07	0.00E+00	0.00E+00	2.81E-08	1.23E-07

Civil & Environmental Consultants, Inc.

SUBJECT	PTE Calculations - Fugitive Emissions			PROJECT NO.	334-808
PROJECT	EQM Gathering OPCO, LLC - Janus Compressor Station			SHEET	23
	Doddridge County, West Virginia				
MADE BY:	ZMS	DATE: 1/10/2024	CHECKED BY: AMH	DATE:	1/11/2024

Major Equipment	Count
Wellheads	--
Separators	--
Meters/Piping	--
Compressors	4
In-Line Heaters	4
Dehydrators	2

Component	Component Count[1] Gas Service	Emission Factor[2,3] (lb TOC/hr/source)	Hourly TOC Emissions (lb TOC/hr)
Valve	700	9.92E-03	6.943
Pump Seals	0	5.29E-03	0.000
Flanges	250	8.60E-04	0.215
Open-ended Lines	12	4.41E-03	0.053
Connectors	650	4.41E-04	0.287
Other	0	1.94E-02	0.000
Low-bleed Pneumatic Controllers	0	6.88E-02	0.000
Intermittent Pneumatic Controllers	3	6.68E-01	2.003
Pneumatic Pumps	0	6.58E-01	0.000
Total	--	--	9.500

Pollutant	Gas Analysis (weight %)	Hourly Emission Rate (lb/hr)	Annual Emission Rate (ton/yr)
TOC	0.9893	9.50	41.61
VOC	0.1492	1.43	6.28
Methane	0.6338	6.09	26.66
CO_2e[4]	--	152.17	666.49
Benzene	0.0002	1.99E-03	8.71E-03
Toluene	0.0002	2.02E-03	8.85E-03
Ethylbenzene	0.0000	1.14E-04	5.01E-04
Xylenes	0.0001	5.88E-04	2.58E-03
n-Hexane	0.0010	9.81E-03	4.30E-02
2,2,4-Trimethylpentane	0.0002	2.35E-03	1.03E-02
Total HAPs	0.0018	0.02	0.07

Notes

[1] Component counts based on average number of components per major equipment type from 40 CFR 98, Table W-1B, unless site-specific information is available.

[2] Emission factors are from EPA document EPA-433/R-95-017, November 1995, unless otherwise noted.

[3] Pneumatic controllers and pumps emission factors are from 40 CFR 98, Table W-1A.

[4] CO_2e emissions are comprised of Methane (GWP of 25).

Civil & Environmental Consultants, Inc.

SUBJECT	PTE Calculations - Rod Packing			PROJECT NO.	334-808
PROJECT	EQM Gathering OPCO, LLC - Janus Compressor Station			SHEET	24
	Doddridge County, West Virginia				
MADE BY:	ZMS	DATE: 1/10/2024	CHECKED BY: AMH	DATE:	1/11/2024

Blowdown Sources	Number of Units	Emission Factor[1] (scf/hr-throw)	Number of Throws[4]	Hours per Year
Compressors	4	12	6	8,760

		Compressors	
Pollutant	Gas Analysis (weight %)	Hourly Emission Rate[2] (lb/hr)	Annual Emission Rate[3] (ton/yr)
VOC	0.1492	2.15	9.41
Carbon Dioxide	0.0034	0.05	0.21
Methane	0.6338	9.13	39.98
CO_2e^3	--	228.23	999.63
Benzene	0.0002	0.00	0.01
Toluene	0.0002	0.00	0.01
Ethylbenzene	0.0000	0.00	0.00
Xylenes	0.0001	0.00	0.00
n-Hexane	0.0010	0.01	0.06
2,2,4-Trimethylpentane	0.0002	0.00	0.02
Total HAPs	0.0018	0.03	0.11

Notes

[1] Emission Factor (scf/hr-throw) and Number of Throws estimated per Marcellus Shale Coalition, Air Quality Committee, Emission Inventory Standardization Workgroup, Reciprocating Compressors, 2018.

[2] Based on the density of natural gas at STP.

[3] CO_2e emissions are comprised of Carbon Dioxide (GWP of 1) and Methane (GWP of 25).

[4] Per Equitrans Gathering OPCO, LLC, each compressor has 6 throws

Civil & Environmental Consultants, Inc.

SUBJECT	PTE Calculations - Pigging Emissions			PROJECT NO.	334-808
PROJECT	EQM Gathering OPCO, LLC - Janus Compressor Station			SHEET	25
	Doddridge County, West Virginia				
MADE BY:	ZMS	DATE: 1/10/2024	CHECKED BY: AMH	DATE:	1/12/2024

Assumptions:	24" Pigging Receivers		20" Pigging Launcher	
Number of Launcher/Receivers	2	unit(s)	1	unit(s)
Events per Year	333	event/yr	167	event/yr
Standard Pressure	14.7	psia	14.7	psia
Standard Temperature	60	°F	60	°F
Density of Gas	0.05	lb/scf	0.05	lb/scf

	24" Pigging Receivers		20" Pigging Launcher	
Gas Released	2,000.00	scf/event	2,000.00	scf/event
	666,666.67	scf/yr	333,333.33	scf/yr
	100.00	lb/event	100.00	lb/event
	16.67	ton/yr	8.33	ton/yr

Pollutant	**Gas Analysis Weight %**	**24" Receivers**		**20" Launcher**		**Total Emissions**	
		(lb/event)	**(ton/yr)**	**(lb/event)**	**(ton/yr)**	**(lb/event)**	**(ton/yr)**
VOC	0.1492	14.92	2.49	14.92	1.24	14.92	3.73
Carbon Dioxide	0.0034	0.34	0.06	0.34	0.03	0.34	0.08
Methane	0.6338	63.38	10.56	63.38	5.28	63.38	15.85
CO_2e[1]	--	1,584.91	264.15	1,584.91	132.08	1,584.91	396.23
Benzene	0.0002	0.02	0.00	0.02	0.00	0.02	0.01
Toluene	0.0002	0.02	0.00	0.02	0.00	0.02	0.01
Ethylbenzene	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
Xylenes	0.0001	0.01	0.00	0.01	0.00	0.01	0.00
n-Hexane	0.0010	0.10	0.02	0.10	0.01	0.10	0.03
2,2,4-Trimethylpentane	0.0002	0.02	0.00	0.02	0.00	0.02	0.01
Total HAPs	0.0018	0.18	0.03	0.18	0.01	0.18	0.04

Notes

[1] CO_2e emissions are comprised of Carbon Dioxide (GWP of 1) and Methane (GWP of 25).

Civil & Environmental Consultants, Inc.

SUBJECT: PTE Calculations - Blowdowns | PROJECT NO.: 334-808
PROJECT: EQM Gathering OPCO, LLC - Janus Compressor Station | SHEET: 26
Doddridge County, West Virginia
MADE BY: ZMS | DATE: 1/10/2024 | CHECKED BY: AMH | DATE: 1/11/2024

Blowdown Sources	Number of Units	Volume of Gas Vented Per Event[1] (scf/event)	Number of Events per Year	Total Volume of Gas (scf/yr)
Station ESD Events	--	358,000	5	1,790,000
Filter Maintenance	--	13,500	15	202,500
Compressors	4	44,000	36	1,584,000

		Station ESD Events		Filter Maintenance		Compressors		Total Emissions	
Pollutant	Gas Analysis (weight %)	Hourly Emission Rate[2] (lb/event)	Annual Emission Rate[2] (ton/yr)	Hourly Emission Rate[2] (lb/event)	Annual Emission Rate[2] (ton/yr)	Hourly Emission Rate[2] (lb/event)	Annual Emission Rate[2] (ton/yr)	Hourly Emission Rate[2] (lb/event)	Annual Emission Rate[2] (ton/yr)
VOC	0.1492	2,670.45	6.68	100.70	0.76	328.21	5.91	3,099.37	13.34
Carbon Dioxide	0.0034	60.05	0.15	2.26	0.02	7.38	0.13	69.69	0.30
Methane	0.6338	11,345.52	28.36	427.83	3.21	1,394.42	25.10	13,167.78	56.67
CO_2e[3]	--	283,698.10	709.25	10,698.11	80.24	34,867.92	627.62	329,264.14	1,417.10
Benzene	0.0002	3.71	0.01	0.14	0.00	0.46	0.01	4.30	0.02
Toluene	0.0002	3.77	0.01	0.14	0.00	0.46	0.01	4.37	0.02
Ethylbenzene	0.0000	0.21	0.00	0.01	0.00	0.03	0.00	0.25	0.00
Xylenes	0.0001	1.10	0.00	0.04	0.00	0.13	0.00	1.27	0.01
n-Hexane	0.0010	18.28	0.05	0.69	0.01	2.25	0.04	21.22	0.09
2,2,4-Trimethylpentane	0.0002	4.37	0.01	0.16	0.00	0.54	0.01	5.08	0.02
Total HAPs	0.0018	31.44	0.08	1.19	0.01	3.86	0.07	36.49	0.16

Notes

[1] Volume is based on engineering estimates.

[2] Based on the density of natural gas at STP.

[3] CO_2e emissions are comprised of Carbon Dioxide (GWP of 1) and Methane (GWP of 25).

Civil & Environmental Consultants, Inc.					
SUBJECT	PTE Calculations - Unpaved Haul Roads			PROJECT NO.	334-808
PROJECT	EQM Gathering OPCO, LLC - Janus Compressor Station			SHEET	27
	Doddridge County, West Virginia				
MADE BY:	ZMS	DATE: 1/11/2024	CHECKED BY: AMH	DATE:	1/11/2024

Assumptions:

	Liquids Hauling	Employee Vehicles	Units
Operating Schedule	8,760	8,760	hr/yr
One-Way Road Length	4,435	4,435	ft/trip
	0.840	0.840	miles/trip
Average Truck Weight	30	3	tons
Truck Capacity	95.24	--	bbl/truck
Throughput	10,000	--	bbl/yr
Trips	105	200	trips/yr
VMT	176	336	VMT/yr
Control Efficiency	0%	0%	

Unpaved Road Emission Factor Calculation (AP-42, 13.2.2)

E = k*((s/12)^a)*(W/3)^b))	AP-42, 13.2.2, Equation 1a
E_{ext} = k*((s/12)^a)*(W/3)^b))*((365-P)/365)	AP-42, 13.2.2, Equation 2

Constants for Equation 1a[1]

Pollutant	Constant, k (lb/VMT)	Constant, a	Constant, b
PM	4.9	0.7	0.45
PM_{10}	1.5	0.9	0.45
$PM_{2.5}$	0.15	0.9	0.45

Parameters	Value	Units	Reference
s= Surface Material Silt Content =	8.5	%	Based on Construction Sites
P = number of "wet" days =	150	days/yr	AP-42, 13.2.2, Figure 13.2.2-1
N = days in averaging period =	365	days	AP-42, 13.2.2, Equation 2

Pollutant	$E_{ext, water trucks}$ (lb/VMT)	$E_{ext,employee vehicles}$ (lb/VMT)	Uncontrolled Emissions (lb/hr)	Uncontrolled Emissions (ton/yr)	Controlled Emissions (lb/hr)	Controlled Emissions (ton/yr)
PM	6.39	2.27	0.22	0.94	0.22	0.94
PM_{10}	1.83	0.65	0.06	0.27	0.06	0.27
$PM_{2.5}$	0.18	0.06	0.01	0.03	0.01	0.03

Notes

[1] U.S. EPA AP-42, Ch. 13.2.2, Table 13.2.2-2

Civil & Environmental Consultants, Inc.

SUBJECT	PTE Calculations - Gas Analysis	PROJECT NO.	334-808
PROJECT	EQM Gathering OPCO, LLC - Janus Compressor Station	SHEET	28
	Doddridge County, West Virginia		
MADE BY:	ZMS	DATE: 1/10/2024	CHECKED BY: AMH	DATE: 1/12/2024

Sample Date		
Location	Janus CS 07/25/23	Average
Pressure (psi)	440	440
Temp (°F)	60	60
HHV (Btu/scf)	1222	1222.00
LHV (Btu/scf)	1201.15	1201.1500

Component	Mol %	Ave Mol%	Mole Fraction	MW	Weight of Component	Weight Fraction	Weight %
Hydrogen Sulfide	--	--	--	34.0810	--	--	--
Nitrogen	0.5226659	0.5227	0.0052	28.0134	0.1464	0.007269095	0.7269%
Oxygen	0.0053645	0.0054	0.0001	31.9988	0.0017	8.52223E-05	0.0085%
Carbon Dioxide	0.1535324	0.1535	0.0015	44.0095	0.0676	0.00335457	0.3355%
Methane	79.5809333	79.5809	0.7958	16.0425	12.7668	0.633828056	63.3828%
Ethane	13.8177932	13.8178	0.1382	30.0690	4.1549	0.206275694	20.6276%
Propane	3.9009909	3.9010	0.0390	44.0956	1.7202	0.085400532	8.5401%
Iso-Butane	0.5017741	0.5018	0.0050	58.1222	0.2916	0.01447907	1.4479%
n-Butane	0.9195746	0.9196	0.0092	58.1222	0.5345	0.026535018	2.6535%
Iso-Pentane	0.2303386	0.2303	0.0023	72.1488	0.1662	0.008250613	0.8251%
n-Pentane	0.205618	0.2056	0.0021	72.1488	0.1484	0.007365134	0.7365%
Other Hexanes	0.1031	0.1031	0.0010	86.1754	0.0888	0.004409376	0.4409%
n-Hexane	0.0239	0.0239	0.0002	86.1754	0.0206	0.001021373	0.1021%
Heptane	0.0111	0.0111	0.0001	100.2019	0.0111	0.000551653	0.0552%
2,2,4-Trimethylpentane	0.0043	0.0043	0.0000	114.2285	0.0049	0.00024441	0.0244%
Octanes	0.0077	0.0077	0.0001	114.2285	0.0089	0.000439388	0.0439%
Benzene	0.0053	0.0053	0.0001	78.1118	0.0042	0.000207194	0.0207%
Toluene	0.0046	0.0046	0.0000	92.1384	0.0042	0.000210435	0.0210%
Ethylbenzene	0.0002	0.0002	0.0000	106.1650	0.0002	1.19108E-05	0.0012%
Xylenes	0.0012	0.0012	0.0000	106.1650	0.0012	6.12557E-05	0.0061%
TOTAL	**100.000**	**100.000**	1.0000		**20.1423**	**1.0000**	**100.0000%**

Total TOC	99.3184	99.3184		--		0.9893	98.9291%
Total VOC	5.9197	5.9197		--		0.1492	14.9187%
Total HAP	0.0395	0.0395		--		0.0018	0.1757%

Hexanes +	0.1614145

ProMax Entry	
Nitrogen	0.0073
Carbon Dioxide	0.0034
Methane	0.6338
Ethane	0.2063
Propane	0.0854
Iso-Butane	0.0145
n-Butane	0.0265
Iso-Pentane	0.0083
n-Pentane	0.0074
n-Hexane	0.0054
Heptane	0.0006
2,2,4-Trimethylpentane	0.0002
Octanes	0.0004
Benzene	0.0002
Toluene	0.0002
Ethylbenzene	0.0000
Xylenes	0.0001

Civil & Environmental Consultants, Inc.

SUBJECT	PTE Calculations - Condensate	PROJECT NO.	334-808
PROJECT	EQM Gathering OPCO, LLC - Janus Compressor Station	SHEET	29
	Doddridge County, West Virginia		
MADE BY:	ZMS DATE: 1/17/2024	CHECKED BY: AMH	DATE: 1/19/2024

Sample Date	9/12/2017		
Location	Janus Compressor Station	Average	

Component	Mol %	Ave Mol%	Mole Fraction	MW	Weight Fraction	Weight %
Hydrogen Sulfide	--	--	--	34.0810	--	--
Nitrogen	0.101	0.1010	0.0010	28.0134	0.0004	0.0410%
Oxygen	--	--	--	31.9988	--	--
Carbon Dioxide	0.039	0.0390	0.0004	44.0095	0.0002	0.0249%
Methane	5.773	5.7730	0.0577	16.0425	0.0134	1.3413%
Ethane	9.163	9.1630	0.0916	30.0690	0.0399	3.9902%
Propane	10.347	10.3470	0.1035	44.0956	0.0661	6.6077%
Iso-Butane	3.165	3.1650	0.0317	58.1222	0.0266	2.6642%
n-Butane	8.796	8.7960	0.0880	58.1222	0.0740	7.4041%
Iso-Pentane	5.558	5.5580	0.0556	72.1488	0.0581	5.8075%
n-Pentane	6.764	6.7640	0.0676	72.1488	0.0707	7.0677%
NeoPentane	0.0000	0.0000	0.0000	72.1488	0.0000	0.0000%
Other Hexanes	32.1127	32.1127	0.3211	86.1754	0.4008	40.0778%
n-Hexane	7.4385	7.4385	0.0744	86.1754	0.0928	9.2835%
Heptane	3.4552	3.4552	0.0346	100.2019	0.0501	5.0141%
2,2,4-Trimethylpentane	1.3428	1.3428	0.0134	114.2285	0.0222	2.2215%
Octanes	2.4141	2.4141	0.0241	114.2285	0.0399	3.9937%
Benzene	1.6647	1.6647	0.0166	78.1118	0.0188	1.8832%
Toluene	1.4334	1.4334	0.0143	92.1384	0.0191	1.9127%
Ethylbenzene	0.0704	0.0704	0.0007	106.1650	0.0011	0.1083%
Xylenes	0.3621	0.3621	0.0036	106.1650	0.0056	0.5568%
TOTAL	**100.000**	**100.000**	**1.0000**	**69.0489**	**1.0000**	**100%**

Total TOC	99.8600	99.8600	0.9986	--	0.9993	99.9342%
Total VOC	84.9240	84.9240	0.8492	--	0.9460	94.6026%
Total HAP	12.3120	12.3120	0.1231	--	0.1597	15.9659%

ProMax Entry	
Nitrogen	0.1010
Carbon Dioxide	0.0390
Methane	5.7730
Ethane	9.1630
Propane	10.3470
Iso-Butane	3.1650
n-Butane	8.7960
Iso-Pentane	5.5580
n-Pentane	6.7640
NeoPentane	0.0000
n-Hexane	39.5512
Heptane	3.4552
2,2,4-Trimethylper	1.3428
Octanes	2.4141
Benzene	1.6647
Toluene	1.4334
Ethylbenzene	0.0704
Xylenes	0.3621

Bryan Research & Engineering, LLC

ProMax® 6.0

Simulation Report

Client Name: Equitrans Midstream
Location: Doddridge County, WV
Job: Janus Compressor Station

ProMax Filename: Janus Tanks ProMax_20240118dm
ProMax Version: 6.0.23032.0
Property Stencil Name: Two (2) Produced Fluids Tanks
Property Stencil Flowsheet: Janus

Emission Summary [Total]

Component Subset	**Tank Losses**	Flashing Losses	Working Losses	Standing Losses	**Loading Losses**
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	**[ton/yr]**
VOCs	**35.208**	31.551	1.595	2.062	**0.644**
HAPs	**7.212**	6.503	0.310	0.400	**0.179**
BTEX	**0.526**	0.475	0.022	0.029	**0.013**
H2S	**0.000**	-	-	-	**-**
Methane	**5.631**	5.588	0.019	0.024	**0.000**

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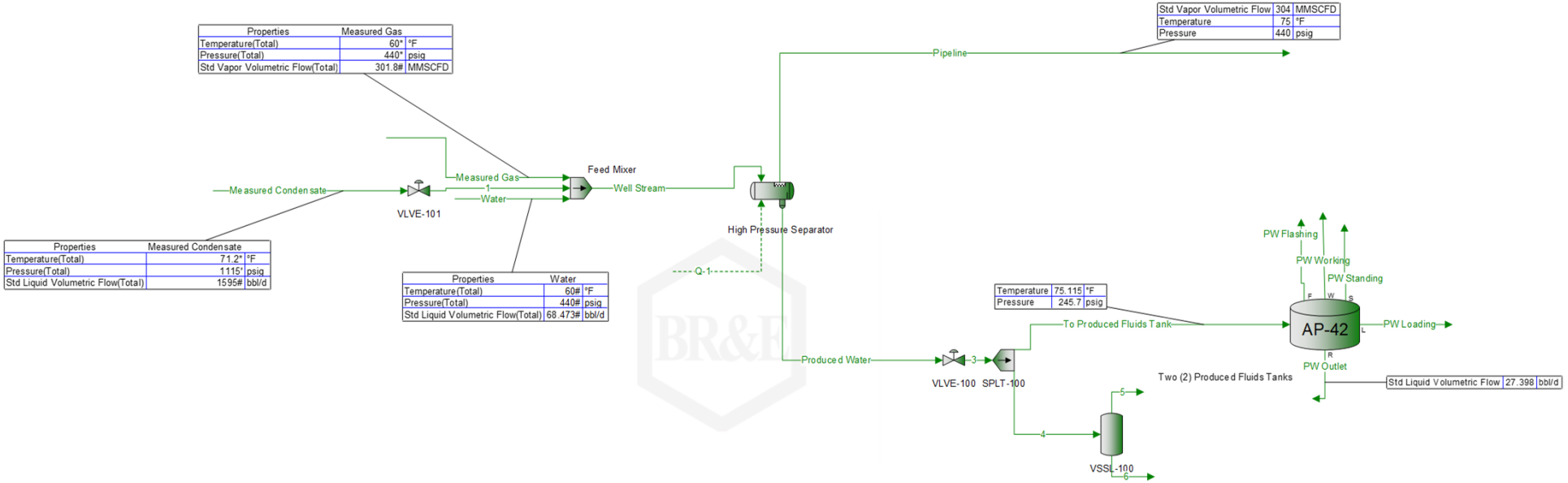
http://www.bre.com/

Report Navigator can be activated via the ProMax Navigator Toolbar.

Janus


Properties | Measured Gas
Temperature(Total) | 60* | °F
Pressure(Total) | 440* | psig
Std Vapor Volumetric Flow(Total) | 301.8# | MMSCFD
Std Vapor Volumetric Flow | 304 | MMSCFD
Temperature | 75 | °F
Pressure | 440 | psig
Pipeline
Measured Condensate
VLVE-101
Measured Gas
1
Water
Feed Mixer
Well Stream
High Pressure Separator
Q-1
Properties | Measured Condensate
Temperature(Total) | 71.2* | °F
Pressure(Total) | 1115* | psig
Std Liquid Volumetric Flow(Total) | 1595# | bbl/d
Properties | Water
Temperature(Total) | 60# | °F
Pressure(Total) | 440# | psig
Std Liquid Volumetric Flow(Total) | 68.473# | bbl/d
Temperature | 75.115 | °F
Pressure | 245.7 | psig
To Produced Fluids Tank
Produced Water
VLVE-100
3
SPLT-100
5
4
VSSL-100
6
PW Flashing
PW Working
PW Standing
F
W
S
AP-42
L
R
PW Loading
PW Outlet
Two (2) Produced Fluids Tanks
Std Liquid Volumetric Flow | 27.398 | bbl/d

Inlet Stream Summary				
Stream Name		Measured Condensate	Measured Gas	Water
Stream Flowsheet		Janus	Janus	Janus
Temperature	°F	71.200	60.000	60.000
Pressure	psig	1115.000	440.000	440.000
Standard Vapor Volumetric Flow	MSCFD	1892.131	301790.000	505.061
Standard Liquid Volumetric Flow	bbl/d	1594.977	136359.127	68.473
Vapor Fraction	(%)	0.000	100.000	0.000
Component		[Mol%]	[Mol%]	[Mol%]
Nitrogen		0.101	0.523	0.000
CO2		0.039	0.154	0.000
Oxygen		0.000	0.005	0.000
Methane		5.773	79.581	0.000
Ethane		9.163	13.818	0.000
Propane		10.347	3.901	0.000
i-Butane		3.165	0.502	0.000
n-Butane		8.796	0.920	0.000
i-Pentane		5.558	0.230	0.000
n-Pentane		6.764	0.206	0.000
2,2-Dimethylpropane		0.000	0.000	0.000
n-Hexane		39.551	0.127	0.000
Heptane		3.455	0.011	0.000
2,2,4-Trimethylpentane		1.343	0.004	0.000
Octane		2.414	0.008	0.000
Nonane		0.000	0.000	0.000
Decane		0.000	0.000	0.000
Benzene		1.665	0.005	0.000
Toluene		1.433	0.005	0.000
Ethylbenzene		0.070	0.000	0.000
o-Xylene		0.362	0.001	0.000
Water		0.000	0.000	100.000
Motor Oil		0.000	0.000	0.000
Ethylene Glycol		0.000	0.000	0.000
Methanol		0.000	0.000	0.000
Triethylene Glycol		0.000	0.000	0.000

Flowsheet Information				
Tank Losses Block Name		Two (2) Produced Fluids Tanks		
Tank Losses Block Inlet Stream		To Produced Fluids Tank		

Tank Characteristics				
Tank Type		Vertical Cylinder		
Time Frame		Year		
Material Category		Light Organics		
Number of Tanks		2		
Shell Height	[ft]	15.010		
Diameter [ft]	[ft]	10.000		
Maximum Liquid Height	[%] | [ft]	90.000	13.509	
Average Liquid Height	[%] | [ft]	50.000	7.505	
Minimum Liquid Height	[%] | [ft]	10.000	1.501	
Sum of Increases in Liquid Level	[ft/yr]	358.236		
Tank Volume	[gal] | [bbl]	8818.655	209.968	
Insulation		Uninsulated		
Bolted or Riveted Construction		False		
Vapor Balanced Tank		False		
Paint Characteristics				
Shell Color		Medium Grey		
Shell Paint Condition		Average		
Roof Color		Medium Grey		
Roof Paint Condition		Average		
Roof Characteristics				
Type		Cone		
Diameter	[ft]	-		
Slope	[ft/ft]	0.063		
Breather Vent Settings				
Breather Vacuum Pressure	[psig]	-0.030		
Breather Vent Pressure	[psig]	0.030		

Loading Loss Parameters		
Cargo Carrier		Tank Truck or Rail Tank Car
Land Based Mode of Operation		Submerged Loading: Dedicated Normal Service
Marine Based Mode of Operation		-
Control Efficiency	[%]	0.000
Truck Annual Leak Test Passed		None
Overall Reduction Efficiency	[%]	0.000

Meteorological Data				
Location		Elkins, WV		
Average Atmospheric Pressure	[psia]	13.690		
Maximum Average Temperature	[°F]	61.500		
Minimum Average Temperature	[°F]	39.000		
Solar Insolation	[BTU/ft^2*day]	1173.000		
Average Wind Speed	[mph]	4.500		
Tank Conditions				
Flashing Temperature	[°F]	62.937		
Maximum Liquid Surface Temperature	[°F]	62.937		
Average Liquid Surface Temperature	[°F]	54.934		
Known Liquid Bulk Temperature?		False		
Bulk Liquid Temperature	[°F]	52.748		
Net Throughput	[bbl/day] | [bbl/yr]	27.462	10023.450	
Net Throughput Per Tank	[bbl/day] | [bbl/yr]	13.731	5011.725	
Annual Turnovers Per Tank		29.833		
Residual Liquid	[bbl/day]	27.398		
Residual Liquid Per Tank	[bbl/day]	13.699		
Raoult's Law Used for Vapor Pressure Calc?		False		
Vapor Pressure @ Minimum Liquid Surface Temperature	[psia]	11.201		
Vapor Pressure @ Maximum Liquid Surface Temperature	[psia]	13.690		
Vapor Pressure @ Average Daily Liquid Surface Temperature	[psia]	12.388		
Tank Conditions				
Heated Tank?		-		
Number of Heating Cycles		-		
Maximum Liquid Bulk Temperature	[°F]	-		
Minimum Liquid Bulk Temperature	[°F]	-		

Emission Summary [Total]					
Component Subset	**Tank Losses**	Flashing Losses	Working Losses	Standing Losses	**Loading Losses**
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	**[ton/yr]**
VOCs	**35.208**	31.551	1.595	2.062	**0.644**
HAPs	**7.212**	6.503	0.310	0.400	**0.179**
BTEX	**0.526**	0.475	0.022	0.029	**0.013**
H2S	**0.000**	-	-	-	**-**

Emission Summary [Per Tank]					
Component Subset	**Tank Losses**	Flashing Losses	Working Losses	Standing Losses	**Loading Losses**
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	**[ton/yr]**
VOCs [C3+]	**17.604**	15.776	0.797	1.031	**0.322**
HAPs	**3.606**	3.251	0.155	0.200	**0.090**
BTEX	**0.263**	0.237	0.011	0.014	**0.006**
H2S	**0.000**	-	-	-	**-**

Stream Properties							
		Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
Molecular Weight	[lb/lbmol]	19.402	39.046	52.050	52.050	64.086	19.113
Net Ideal Gas Heating Value	[BTU/scf]	-	2029.503	2667.545	2667.545	3238.263	-
Standard Vapor Volumetric Flow	[scf/d]	-	2443.105	71.552	92.515	21.241	-
Specific Gravity		-	-	-	-	-	0.969
Reid Vapor Pressure	[psi]	17.848	-	-	-	-	7.510
API Gravity		-	-	-	-	-	14.419
Standard Liquid Volumetric Flow	[bbl/d]	29.019	-	-	-	-	27.398

Stream Mass Flow [Total]							
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual	Total Emissions
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]
Nitrogen	0.023	0.023	0.000	0.000	0.000	0.000	0.023
CO2	0.139	0.132	0.003	0.004	0.000	0.000	0.139
Oxygen	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Methane	5.631	5.588	0.019	0.024	0.000	0.000	5.631
Ethane	8.497	8.142	0.155	0.200	0.000	0.000	8.497
Propane	10.133	8.827	0.468	0.604	0.051	0.234	9.899
i-Butane	3.913	2.818	0.145	0.188	0.062	0.761	3.151
n-Butane	10.474	6.571	0.336	0.434	0.163	3.133	7.341
i-Pentane	7.468	2.996	0.150	0.194	0.083	4.129	3.340
n-Pentane	9.096	2.998	0.148	0.192	0.083	5.758	3.339
2,2-Dimethylpropane	0.000	0.000	0.000	0.000	0.000	0.000	0.000
n-Hexane	51.140	5.801	0.277	0.358	0.160	44.705	6.435
Heptane	13.711	0.508	0.024	0.030	0.014	13.149	0.562
2,2,4-Trimethylpentane	5.721	0.227	0.011	0.014	0.006	5.470	0.252
Octane	30.133	0.330	0.015	0.019	0.008	29.769	0.364
Nonane	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Decane	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Benzene	1.977	0.221	0.011	0.014	0.006	1.732	0.246
Toluene	5.874	0.198	0.009	0.012	0.005	5.655	0.220
Ethylbenzene	0.889	0.009	0.000	0.001	0.000	0.880	0.010
o-Xylene	5.837	0.046	0.002	0.003	0.001	5.787	0.051
Water	1576.030	0.440	0.020	0.025	0.011	1575.545	0.485
Motor Oil	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ethylene Glycol	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Methanol	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Triethylene Glycol	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Stream Compostion						
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
	[Mol%]	[Mol%]	[Mol%]	[Mol%]	[Mol%]	[Mol%]
Nitrogen	0.001	0.068	0.002	0.002	0.000	0.000
CO2	0.004	0.255	0.215	0.215	0.000	0.000
Oxygen	0.000	0.001	0.000	0.000	0.000	0.000
Methane	0.390	29.646	3.372	3.372	0.000	0.000
Ethane	0.314	23.048	14.962	14.962	0.000	0.000
Propane	0.255	17.038	30.812	30.812	11.429	0.006
i-Butane	0.075	4.126	7.274	7.274	10.360	0.015
n-Butane	0.200	9.622	16.793	16.793	27.485	0.061
i-Pentane	0.115	3.535	6.030	6.030	11.234	0.064
n-Pentane	0.140	3.537	5.975	5.975	11.326	0.090
2,2-Dimethylpropane	0.000	0.000	0.000	0.000	0.000	0.000
n-Hexane	0.659	5.729	9.330	9.330	18.224	0.584
Heptane	0.152	0.431	0.682	0.682	1.323	0.148
2,2,4-Trimethylpentane	0.056	0.169	0.270	0.270	0.526	0.054
Octane	0.293	0.246	0.376	0.376	0.722	0.294
Nonane	0.000	0.000	0.000	0.000	0.000	0.000
Decane	0.000	0.000	0.000	0.000	0.000	0.000
Benzene	0.028	0.241	0.396	0.396	0.768	0.025
Toluene	0.071	0.183	0.290	0.290	0.560	0.069
Ethylbenzene	0.009	0.007	0.011	0.011	0.021	0.009
o-Xylene	0.061	0.037	0.056	0.056	0.107	0.061
Water	97.177	2.079	3.152	3.152	5.915	98.520
Motor Oil	0.000	0.000	0.000	0.000	0.000	0.000
Ethylene Glycol	0.000	0.000	0.000	0.000	0.000	0.000
Methanol	0.000	0.000	0.000	0.000	0.000	0.000
Triethylene Glycol	0.000	0.000	0.000	0.000	0.000	0.000
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
	[Mass%]	[Mass%]	[Mass%]	[Mass%]	[Mass%]	[Mass%]
Nitrogen	0.001	0.049	0.001	0.001	0.000	0.000
CO2	0.008	0.287	0.182	0.182	0.000	0.000
Oxygen	0.000	0.001	0.000	0.000	0.000	0.000
Methane	0.322	12.180	1.039	1.039	0.000	0.000
Ethane	0.486	17.749	8.643	8.643	0.000	0.000
Propane	0.580	19.241	26.103	26.103	7.864	0.014
i-Butane	0.224	6.142	8.122	8.122	9.396	0.045
n-Butane	0.600	14.323	18.752	18.752	24.928	0.185
i-Pentane	0.428	6.531	8.359	8.359	12.647	0.243
n-Pentane	0.521	6.536	8.283	8.283	12.751	0.339
2,2-Dimethylpropane	0.000	0.000	0.000	0.000	0.000	0.000
n-Hexane	2.928	12.644	15.447	15.447	24.505	2.635
Heptane	0.785	1.107	1.313	1.313	2.068	0.775
2,2,4-Trimethylpentane	0.328	0.496	0.593	0.593	0.938	0.322
Octane	1.725	0.719	0.826	0.826	1.286	1.755
Nonane	0.000	0.000	0.000	0.000	0.000	0.000
Decane	0.000	0.000	0.000	0.000	0.000	0.000
Benzene	0.113	0.483	0.595	0.595	0.937	0.102
Toluene	0.336	0.432	0.514	0.514	0.806	0.333
Ethylbenzene	0.051	0.019	0.022	0.022	0.034	0.052
o-Xylene	0.334	0.100	0.115	0.115	0.177	0.341
Water	90.230	0.959	1.091	1.091	1.663	92.859
Motor Oil	0.000	0.000	0.000	0.000	0.000	0.000
Ethylene Glycol	0.000	0.000	0.000	0.000	0.000	0.000
Methanol	0.000	0.000	0.000	0.000	0.000	0.000
Triethylene Glycol	0.000	0.000	0.000	0.000	0.000	0.000

Bryan Research & Engineering, LLC

ProMax® 6.0

Simulation Report

Client Name: Equitrans Midstream
Location: Doddridge County, WV
Job: Janus Compressor Station

ProMax Filename: Janus Tanks ProMax_MiscTanks_20240305
ProMax Version: 6.0.23032.0
Property Stencil Name: Comp Lube Oil Tanks T-013-T-016
Property Stencil Flowsheet: Janus

Emission Summary [Total]

Component Subset	**Tank Losses**	Flashing Losses	Working Losses	Standing Losses	**Loading Losses**
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	**[ton/yr]**
VOCs	**0.000**	0.000	0.000	0.000	-
HAPs	**0.000**	0.000	0.000	0.000	-
BTEX	**0.000**	0.000	0.000	0.000	-
H2S	**0.000**	-	-	-	-
Methane	**0.000**	0.000	0.000	0.000	-

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Report Navigator can be activated via the ProMax Navigator Toolbar.

Bryan Research & Engineering, LLC

ProMax® 6.0

Simulation Report

Client Name: Equitrans Midstream
Location: Doddridge County, WV
Job: Janus Compressor Station

ProMax Filename: Janus Tanks ProMax_MiscTanks_20240305
ProMax Version: 6.0.23032.0
Property Stencil Name: Comp Lube Oil Tank T-004
Property Stencil Flowsheet: Janus

Emission Summary [Total]

Component Subset	**Tank Losses**	Flashing Losses	Working Losses	Standing Losses	**Loading Losses**
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	**[ton/yr]**
VOCs	**0.000**	0.000	0.000	0.000	-
HAPs	**0.000**	0.000	0.000	0.000	-
BTEX	**0.000**	0.000	0.000	0.000	-
H2S	**0.000**	-	-	-	-
Methane	**0.000**	0.000	0.000	0.000	-

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Simulation Report

Client Name: Equitrans Midstream
Location: Doddridge County, WV
Job: Janus Compressor Station

ProMax Filename: Janus Tanks ProMax_MiscTanks_20240305
ProMax Version: 6.0.23032.0
Property Stencil Name: Engine Lube Oil Tanks T-009-T-012
Property Stencil Flowsheet: Janus

Emission Summary [Total]

Component Subset	**Tank Losses**	Flashing Losses	Working Losses	Standing Losses	**Loading Losses**
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	**[ton/yr]**
VOCs	**0.000**	0.000	0.000	0.000	-
HAPs	**0.000**	0.000	0.000	0.000	-
BTEX	**0.000**	0.000	0.000	0.000	-
H2S	**0.000**	-	-	-	-
Methane	**0.000**	0.000	0.000	0.000	-

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Simulation Report

Client Name: Equitrans Midstream
Location: Doddridge County, WV
Job: Janus Compressor Station

ProMax Filename: Janus Tanks ProMax_MiscTanks_20240305
ProMax Version: 6.0.23032.0
Property Stencil Name: Engine Lube Oil Tank T-003
Property Stencil Flowsheet: Janus

Emission Summary [Total]

Component Subset	**Tank Losses**	Flashing Losses	Working Losses	Standing Losses	**Loading Losses**
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	**[ton/yr]**
VOCs	**0.000**	0.000	0.000	0.000	-
HAPs	**0.000**	0.000	0.000	0.000	-
BTEX	**0.000**	0.000	0.000	0.000	-
H2S	**0.000**	-	-	-	-
Methane	**0.000**	0.000	0.000	0.000	-

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Simulation Report

Client Name: Equitrans Midstream
Location: Doddridge County, WV
Job: Janus Compressor Station

ProMax Filename: Janus Tanks ProMax_MiscTanks_20240305
ProMax Version: 6.0.23032.0
Property Stencil Name: MEG Tanks T-005-T-006
Property Stencil Flowsheet: Janus

Emission Summary [Total]

Component Subset	**Tank Losses**	Flashing Losses	Working Losses	Standing Losses	**Loading Losses**
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	**[ton/yr]**
VOCs	**0.000**	0.000	0.000	0.000	-
HAPs	**0.000**	0.000	0.000	0.000	-
BTEX	**0.000**	0.000	0.000	0.000	-
H2S	**0.000**	-	-	-	-
Methane	**0.000**	0.000	0.000	0.000	-

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Simulation Report

Client Name: Equitrans Midstream
Location: Doddridge County, WV
Job: Janus Compressor Station

ProMax Filename: Janus Tanks ProMax_MiscTanks_20240305
ProMax Version: 6.0.23032.0
Property Stencil Name: New TEG Tank T-023
Property Stencil Flowsheet: Janus

Emission Summary [Total]

Component Subset	**Tank Losses**	Flashing Losses	Working Losses	Standing Losses	**Loading Losses**
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	**[ton/yr]**
VOCs	**0.000**	0.000	0.000	0.000	-
HAPs	**0.000**	0.000	0.000	0.000	-
BTEX	**0.000**	0.000	0.000	0.000	-
H2S	**0.000**	-	-	-	-
Methane	**0.000**	0.000	0.000	0.000	-

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Simulation Report

Client Name: Equitrans Midstream
Location: Doddridge County, WV
Job: Janus Compressor Station

ProMax Filename: Janus Tanks ProMax_MiscTanks_20240305
ProMax Version: 6.0.23032.0
Property Stencil Name: Used Oil Tank T-007
Property Stencil Flowsheet: Janus

Emission Summary [Total]

Component Subset	**Tank Losses**	Flashing Losses	Working Losses	Standing Losses	**Loading Losses**
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	**[ton/yr]**
VOCs	**0.000**	0.000	0.000	0.000	-
HAPs	**0.000**	0.000	0.000	0.000	-
BTEX	**0.000**	0.000	0.000	0.000	-
H2S	**0.000**	-	-	-	-
Methane	**0.000**	0.000	0.000	0.000	-

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Simulation Report

Client Name: Equitrans Midstream
Location: Doddridge County, WV
Job: Janus Compressor Station

ProMax Filename: Janus Tanks ProMax_MiscTanks_20240305
ProMax Version: 6.0.23032.0
Property Stencil Name: Used TEG Tank T-024
Property Stencil Flowsheet: Janus

Emission Summary [Total]

Component Subset	**Tank Losses**	Flashing Losses	Working Losses	Standing Losses	**Loading Losses**
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	**[ton/yr]**
VOCs	**0.000**	0.000	0.000	0.000	-
HAPs	**0.000**	0.000	0.000	0.000	-
BTEX	**0.000**	0.000	0.000	0.000	-
H2S	**0.000**	-	-	-	-
Methane	**0.000**	0.000	0.000	0.000	-

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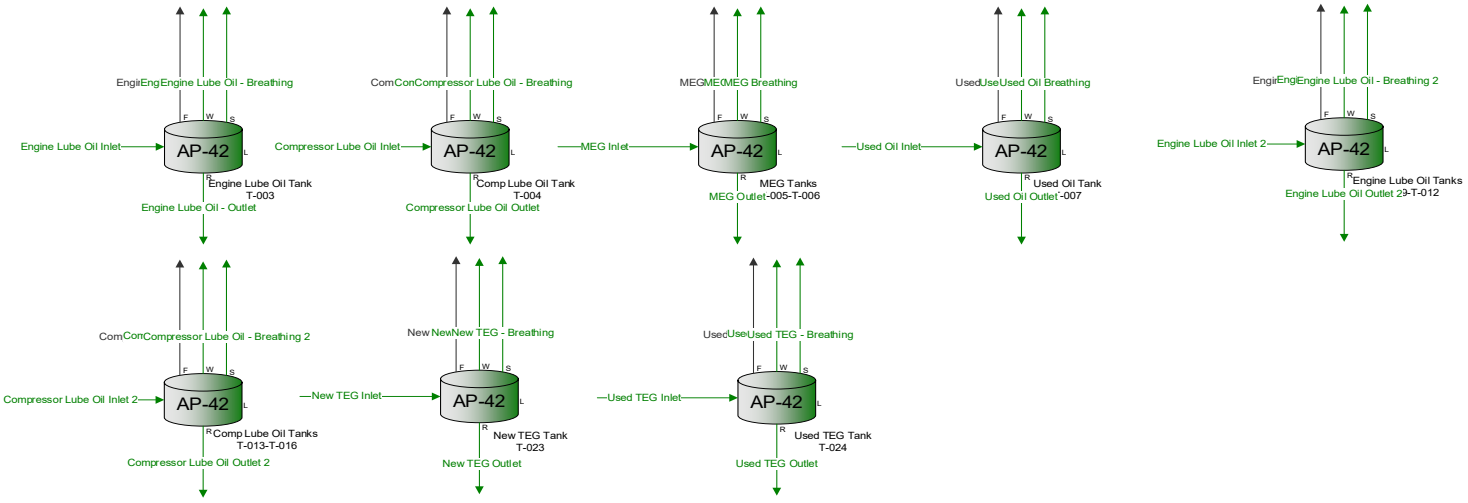
Janus


Engi
Eng
Engine Lube Oil - Breathing
F
W
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Engine Lube Oil Inlet
AP-42
L
R
Engine Lube Oil Tank
T-003
Engine Lube Oil - Outlet
Com
Con
Compressor Lube Oil - Breathing
Compressor Lube Oil Inlet
Comp Lube Oil Tank
T-004
Compressor Lube Oil Outlet
MEG
MEG Breathing
MEG Inlet
MEG Tanks
MEG Outlet-005-T-006
Used
Use
Used Oil Breathing
Used Oil Inlet
Used Oil Tank
Used Oil Outlet-007
Engine Lube Oil - Breathing 2
Engine Lube Oil Inlet 2
Engine Lube Oil Tanks
Engine Lube Oil Outlet 2-T-012
Compressor Lube Oil - Breathing 2
Compressor Lube Oil Inlet 2
Comp Lube Oil Tanks
T-013-T-016
Compressor Lube Oil Outlet 2
New
New TEG - Breathing
New TEG Inlet
New TEG Tank
T-023
New TEG Outlet
Used TEG - Breathing
Used TEG Inlet
Used TEG Tank
T-024
Used TEG Outlet

Inlet Stream Summary				
Stream Name		Compressor Lube Oil Inlet 2	Compressor Lube Oil Inlet	Engine Lube Oil Inlet 2
Stream Flowsheet		Janus	Janus	Janus
Temperature	°F	52.100	52.100	52.100
Pressure	psig	0.000	0.000	0.000
Standard Vapor Volumetric Flow	MSCFD	0.134	0.135	0.078
Standard Liquid Volumetric Flow	bbl/d	0.471	0.474	0.274
Vapor Fraction	(%)	0.000	0.000	0.000
Component		[Mol%]	[Mol%]	[Mol%]
Nitrogen		0.000	0.000	0.000
CO2		0.000	0.000	0.000
Oxygen		0.000	0.000	0.000
Methane		0.000	0.000	0.000
Ethane		0.000	0.000	0.000
Propane		0.000	0.000	0.000
i-Butane		0.000	0.000	0.000
n-Butane		0.000	0.000	0.000
i-Pentane		0.000	0.000	0.000
n-Pentane		0.000	0.000	0.000
2,2-Dimethylpropane		0.000	0.000	0.000
n-Hexane		0.000	0.000	0.000
Heptane		0.000	0.000	0.000
2,2,4-Trimethylpentane		0.000	0.000	0.000
Octane		0.000	0.000	0.000
Nonane		0.000	0.000	0.000
Decane		0.000	0.000	0.000
Benzene		0.000	0.000	0.000
Toluene		0.000	0.000	0.000
Ethylbenzene		0.000	0.000	0.000
o-Xylene		0.000	0.000	0.000
Water		0.000	0.000	0.000
Motor Oil		100.000	100.000	100.000
Ethylene Glycol		0.000	0.000	0.000
Methanol		0.000	0.000	0.000
Triethylene Glycol		0.000	0.000	0.000

Inlet Stream Summary				
Stream Name		Engine Lube Oil Inlet	MEG Inlet	New TEG Inlet
Stream Flowsheet		Janus	Janus	Janus
Temperature	°F	52.100	52.100	52.100
Pressure	psig	0.000	0.000	0.000
Standard Vapor Volumetric Flow	MSCFD	0.078	0.327	0.274
Standard Liquid Volumetric Flow	bbl/d	0.274	0.137	0.274
Vapor Fraction	(%)	0.000	0.000	0.000
Component		[Mol%]	[Mol%]	[Mol%]
Nitrogen		0.000	0.000	0.000
CO2		0.000	0.000	0.000
Oxygen		0.000	0.000	0.000
Methane		0.000	0.000	0.000
Ethane		0.000	0.000	0.000
Propane		0.000	0.000	0.000
i-Butane		0.000	0.000	0.000
n-Butane		0.000	0.000	0.000
i-Pentane		0.000	0.000	0.000
n-Pentane		0.000	0.000	0.000
2,2-Dimethylpropane		0.000	0.000	0.000
n-Hexane		0.000	0.000	0.000
Heptane		0.000	0.000	0.000
2,2,4-Trimethylpentane		0.000	0.000	0.000
Octane		0.000	0.000	0.000
Nonane		0.000	0.000	0.000
Decane		0.000	0.000	0.000
Benzene		0.000	0.000	0.000
Toluene		0.000	0.000	0.000
Ethylbenzene		0.000	0.000	0.000
o-Xylene		0.000	0.000	0.000
Water		0.000	0.000	0.000
Motor Oil		100.000	0.000	0.000
Ethylene Glycol		0.000	100.000	0.000
Methanol		0.000	0.000	0.000
Triethylene Glycol		0.000	0.000	100.000

Inlet Stream Summary			
Stream Name		Used Oil Inlet	Used TEG Inlet
Stream Flowsheet		Janus	Janus
Temperature	°F	52.100	52.100
Pressure	psig	0.000	0.000
Standard Vapor Volumetric Flow	MSCFD	0.078	0.274
Standard Liquid Volumetric Flow	bbl/d	0.274	0.274
Vapor Fraction	(%)	0.000	0.000
Component		[Mol%]	[Mol%]
Nitrogen		0.000	0.000
CO2		0.000	0.000
Oxygen		0.000	0.000
Methane		0.000	0.000
Ethane		0.000	0.000
Propane		0.000	0.000
i-Butane		0.000	0.000
n-Butane		0.000	0.000
i-Pentane		0.000	0.000
n-Pentane		0.000	0.000
2,2-Dimethylpropane		0.000	0.000
n-Hexane		0.000	0.000
Heptane		0.000	0.000
2,2,4-Trimethylpentane		0.000	0.000
Octane		0.000	0.000
Nonane		0.000	0.000
Decane		0.000	0.000
Benzene		0.000	0.000
Toluene		0.000	0.000
Ethylbenzene		0.000	0.000
o-Xylene		0.000	0.000
Water		0.000	0.000
Motor Oil		100.000	0.000
Ethylene Glycol		0.000	0.000
Methanol		0.000	0.000
Triethylene Glycol		0.000	100.000

Flowsheet Information				
Tank Losses Block Name		Comp Lube Oil Tanks T-013-T-016		
Tank Losses Block Inlet Stream		Compressor Lube Oil Inlet 2		

Tank Characteristics				
Tank Type		Horizontal Cylinder		
Time Frame		Year		
Material Category		Light Organics		
Number of Tanks		4		
Shell Height	[ft]	5.130		
Diameter [ft]	[ft]	3.170		
Maximum Liquid Height	[%] | [ft]	90.000	2.853	
Average Liquid Height	[%] | [ft]	50.000	1.585	
Minimum Liquid Height	[%] | [ft]	10.000	0.317	
Sum of Increases in Liquid Level	[ft/yr]	30.531		
Tank Volume	[gal] | [bbl]	302.871	7.211	
Insulation		Uninsulated		
Bolted or Riveted Construction		False		
Vapor Balanced Tank		False		
Paint Characteristics				
Shell Color		Black		
Shell Paint Condition		Average		
Roof Color				
Roof Paint Condition				
Roof Characteristics				
Type				
Diameter	[ft]	-		
Slope	[ft/ft]	-		
Breather Vent Settings				
Breather Vacuum Pressure	[psig]	-0.030		
Breather Vent Pressure	[psig]	0.030		

Loading Loss Parameters		
Cargo Carrier		-
Land Based Mode of Operation		-
Marine Based Mode of Operation		-
Control Efficiency	[%]	-
Truck Annual Leak Test Passed		-
Overall Reduction Efficiency	[%]	-

Meteorological Data				
Location		Elkins, WV		
Average Atmospheric Pressure	[psia]	13.690		
Maximum Average Temperature	[°F]	61.500		
Minimum Average Temperature	[°F]	39.000		
Solar Insolation	[BTU/ft^2*day]	1173.000		
Average Wind Speed	[mph]	4.500		
Tank Conditions				
Flashing Temperature	[°F]	65.768		
Maximum Liquid Surface Temperature	[°F]	65.768		
Average Liquid Surface Temperature	[°F]	56.587		
Known Liquid Bulk Temperature?		False		
Bulk Liquid Temperature	[°F]	53.663		
Net Throughput	[bbl/day] | [bbl/yr]	0.470	171.685	
Net Throughput Per Tank	[bbl/day] | [bbl/yr]	0.118	42.921	
Annual Turnovers Per Tank		12.039		
Residual Liquid	[bbl/day]	0.471		
Residual Liquid Per Tank	[bbl/day]	0.118		
Raoult's Law Used for Vapor Pressure Calc?		False		
Vapor Pressure @ Minimum Liquid Surface Temperature	[psia]	0.000		
Vapor Pressure @ Maximum Liquid Surface Temperature	[psia]	0.000		
Vapor Pressure @ Average Daily Liquid Surface Temperature	[psia]	0.000		
Tank Conditions				
Heated Tank?		-		

Flowsheet Information				
Tank Losses Block Name		Comp Lube Oil Tank T-004		
Tank Losses Block Inlet Stream		Compressor Lube Oil Inlet		

Tank Characteristics				
Tank Type		Horizontal Cylinder		
Time Frame		Year		
Material Category		Light Organics		
Number of Tanks		1		
Shell Height	[ft]	11.970		
Diameter [ft]	[ft]	5.330		
Maximum Liquid Height	[%] | [ft]	90.000	4.797	
Average Liquid Height	[%] | [ft]	50.000	2.665	
Minimum Liquid Height	[%] | [ft]	10.000	0.533	
Sum of Increases in Liquid Level	[ft/yr]	43.380		
Tank Volume	[gal] | [bbl]	1997.884	47.569	
Insulation		Uninsulated		
Bolted or Riveted Construction		False		
Vapor Balanced Tank		False		
Paint Characteristics				
Shell Color		Tan		
Shell Paint Condition		Average		
Roof Color				
Roof Paint Condition				
Roof Characteristics				
Type				
Diameter	[ft]	-		
Slope	[ft/ft]	-		
Breather Vent Settings				
Breather Vacuum Pressure	[psig]	-0.030		
Breather Vent Pressure	[psig]	0.030		

Loading Loss Parameters		
Cargo Carrier		-
Land Based Mode of Operation		-
Marine Based Mode of Operation		-
Control Efficiency	[%]	-
Truck Annual Leak Test Passed		-
Overall Reduction Efficiency	[%]	-

Meteorological Data				
Location		Elkins, WV		
Average Atmospheric Pressure	[psia]	13.690		
Maximum Average Temperature	[°F]	61.500		
Minimum Average Temperature	[°F]	39.000		
Solar Insolation	[BTU/ft^2*day]	1173.000		
Average Wind Speed	[mph]	4.500		
Tank Conditions				
Flashing Temperature	[°F]	60.398		
Maximum Liquid Surface Temperature	[°F]	60.398		
Average Liquid Surface Temperature	[°F]	53.322		
Known Liquid Bulk Temperature?		False		
Bulk Liquid Temperature	[°F]	51.974		
Net Throughput	[bbl/day] | [bbl/yr]	0.472	172.410	
Net Throughput Per Tank	[bbl/day] | [bbl/yr]	0.472	172.410	
Annual Turnovers Per Tank		10.174		
Residual Liquid	[bbl/day]	0.474		
Residual Liquid Per Tank	[bbl/day]	0.474		
Raoult's Law Used for Vapor Pressure Calc?		False		
Vapor Pressure @ Minimum Liquid Surface Temperature	[psia]	0.000		
Vapor Pressure @ Maximum Liquid Surface Temperature	[psia]	0.000		
Vapor Pressure @ Average Daily Liquid Surface Temperature	[psia]	0.000		
Tank Conditions				
Heated Tank?		-		

Flowsheet Information		
Tank Losses Block Name		Engine Lube Oil Tanks T-009-T-012
Tank Losses Block Inlet Stream		Engine Lube Oil Inlet 2

Tank Characteristics				
Tank Type		Horizontal Cylinder		
Time Frame		Year		
Material Category		Light Organics		
Number of Tanks		4		
Shell Height	[ft]	5.130		
Diameter [ft]	[ft]	3.170		
Maximum Liquid Height	[%] | [ft]	90.000	2.853	
Average Liquid Height	[%] | [ft]	50.000	1.585	
Minimum Liquid Height	[%] | [ft]	10.000	0.317	
Sum of Increases in Liquid Level	[ft/yr]	17.750		
Tank Volume	[gal] | [bbl]	302.871	7.211	
Insulation		Uninsulated		
Bolted or Riveted Construction		False		
Vapor Balanced Tank		False		
Paint Characteristics				
Shell Color		Black		
Shell Paint Condition		Average		
Roof Color				
Roof Paint Condition				
Roof Characteristics				
Type				
Diameter	[ft]	-		
Slope	[ft/ft]	-		
Breather Vent Settings				
Breather Vacuum Pressure	[psig]	-0.030		
Breather Vent Pressure	[psig]	0.030		

Loading Loss Parameters		
Cargo Carrier		-
Land Based Mode of Operation		-
Marine Based Mode of Operation		-
Control Efficiency	[%]	-
Truck Annual Leak Test Passed		-
Overall Reduction Efficiency	[%]	-

Meteorological Data				
Location		Elkins, WV		
Average Atmospheric Pressure	[psia]	13.690		
Maximum Average Temperature	[°F]	61.500		
Minimum Average Temperature	[°F]	39.000		
Solar Insolation	[BTU/ft^2*day]	1173.000		
Average Wind Speed	[mph]	4.500		
Tank Conditions				
Flashing Temperature	[°F]	65.768		
Maximum Liquid Surface Temperature	[°F]	65.768		
Average Liquid Surface Temperature	[°F]	56.587		
Known Liquid Bulk Temperature?		False		
Bulk Liquid Temperature	[°F]	53.663		
Net Throughput	[bbl/day] | [bbl/yr]	0.273	99.817	
Net Throughput Per Tank	[bbl/day] | [bbl/yr]	0.068	24.954	
Annual Turnovers Per Tank		6.999		
Residual Liquid	[bbl/day]	0.274		
Residual Liquid Per Tank	[bbl/day]	0.068		
Raoult's Law Used for Vapor Pressure Calc?		False		
Vapor Pressure @ Minimum Liquid Surface Temperature	[psia]	0.000		
Vapor Pressure @ Maximum Liquid Surface Temperature	[psia]	0.000		
Vapor Pressure @ Average Daily Liquid Surface Temperature	[psia]	0.000		
Tank Conditions				
Heated Tank?		-		

Flowsheet Information				
Tank Losses Block Name		Engine Lube Oil Tank T-003		
Tank Losses Block Inlet Stream		Engine Lube Oil Inlet		

Tank Characteristics				
Tank Type		Horizontal Cylinder		
Time Frame		Year		
Material Category		Light Organics		
Number of Tanks		1		
Shell Height	[ft]	11.970		
Diameter [ft]	[ft]	5.330		
Maximum Liquid Height	[%] | [ft]	90.000	4.797	
Average Liquid Height	[%] | [ft]	50.000	2.665	
Minimum Liquid Height	[%] | [ft]	10.000	0.533	
Sum of Increases in Liquid Level	[ft/yr]	25.075		
Tank Volume	[gal] | [bbl]	1997.884	47.569	
Insulation		Uninsulated		
Bolted or Riveted Construction		False		
Vapor Balanced Tank		False		
Paint Characteristics				
Shell Color		Tan		
Shell Paint Condition		Average		
Roof Color				
Roof Paint Condition				
Roof Characteristics				
Type				
Diameter	[ft]	-		
Slope	[ft/ft]	-		
Breather Vent Settings				
Breather Vacuum Pressure	[psig]	-0.030		
Breather Vent Pressure	[psig]	0.030		

Loading Loss Parameters		
Cargo Carrier		-
Land Based Mode of Operation		-
Marine Based Mode of Operation		-
Control Efficiency	[%]	-
Truck Annual Leak Test Passed		-
Overall Reduction Efficiency	[%]	-

Meteorological Data				
Location		Elkins, WV		
Average Atmospheric Pressure	[psia]	13.690		
Maximum Average Temperature	[°F]	61.500		
Minimum Average Temperature	[°F]	39.000		
Solar Insolation	[BTU/ft^2*day]	1173.000		
Average Wind Speed	[mph]	4.500		
Tank Conditions				
Flashing Temperature	[°F]	60.398		
Maximum Liquid Surface Temperature	[°F]	60.398		
Average Liquid Surface Temperature	[°F]	53.322		
Known Liquid Bulk Temperature?		False		
Bulk Liquid Temperature	[°F]	51.974		
Net Throughput	[bbl/day] | [bbl/yr]	0.273	99.659	
Net Throughput Per Tank	[bbl/day] | [bbl/yr]	0.273	99.659	
Annual Turnovers Per Tank		5.881		
Residual Liquid	[bbl/day]	0.274		
Residual Liquid Per Tank	[bbl/day]	0.274		
Raoult's Law Used for Vapor Pressure Calc?		False		
Vapor Pressure @ Minimum Liquid Surface Temperature	[psia]	0.000		
Vapor Pressure @ Maximum Liquid Surface Temperature	[psia]	0.000		
Vapor Pressure @ Average Daily Liquid Surface Temperature	[psia]	0.000		
Tank Conditions				
Heated Tank?		-		

Flowsheet Information				
Tank Losses Block Name		MEG Tanks T-005-T-006		
Tank Losses Block Inlet Stream		MEG Inlet		

Tank Characteristics				
Tank Type		Horizontal Cylinder		
Time Frame		Year		
Material Category		Light Organics		
Number of Tanks		2		
Shell Height	[ft]	11.970		
Diameter [ft]	[ft]	5.330		
Maximum Liquid Height	[%] | [ft]	90.000	4.797	
Average Liquid Height	[%] | [ft]	50.000	2.665	
Minimum Liquid Height	[%] | [ft]	10.000	0.533	
Sum of Increases in Liquid Level	[ft/yr]	6.257		
Tank Volume	[gal] | [bbl]	1997.884	47.569	
Insulation		Uninsulated		
Bolted or Riveted Construction		False		
Vapor Balanced Tank		False		
Paint Characteristics				
Shell Color		Tan		
Shell Paint Condition		Average		
Roof Color				
Roof Paint Condition				
Roof Characteristics				
Type				
Diameter	[ft]	-		
Slope	[ft/ft]	-		
Breather Vent Settings				
Breather Vacuum Pressure	[psig]	-0.030		
Breather Vent Pressure	[psig]	0.030		

Loading Loss Parameters		
Cargo Carrier		-
Land Based Mode of Operation		-
Marine Based Mode of Operation		-
Control Efficiency	[%]	-
Truck Annual Leak Test Passed		-
Overall Reduction Efficiency	[%]	-

Meteorological Data				
Location		Elkins, WV		
Average Atmospheric Pressure	[psia]	13.690		
Maximum Average Temperature	[°F]	61.500		
Minimum Average Temperature	[°F]	39.000		
Solar Insolation	[BTU/ft^2*day]	1173.000		
Average Wind Speed	[mph]	4.500		
Tank Conditions				
Flashing Temperature	[°F]	60.398		
Maximum Liquid Surface Temperature	[°F]	60.398		
Average Liquid Surface Temperature	[°F]	53.322		
Known Liquid Bulk Temperature?		False		
Bulk Liquid Temperature	[°F]	51.974		
Net Throughput	[bbl/day] | [bbl/yr]	0.136	49.736	
Net Throughput Per Tank	[bbl/day] | [bbl/yr]	0.068	24.868	
Annual Turnovers Per Tank		1.467		
Residual Liquid	[bbl/day]	0.137		
Residual Liquid Per Tank	[bbl/day]	0.068		
Raoult's Law Used for Vapor Pressure Calc?		False		
Vapor Pressure @ Minimum Liquid Surface Temperature	[psia]	0.000		
Vapor Pressure @ Maximum Liquid Surface Temperature	[psia]	0.001		
Vapor Pressure @ Average Daily Liquid Surface Temperature	[psia]	0.000		
Tank Conditions				
Heated Tank?		-		

Flowsheet Information		
Tank Losses Block Name		New TEG Tank T-023
Tank Losses Block Inlet Stream		New TEG Inlet

Tank Characteristics				
Tank Type		Horizontal Cylinder		
Time Frame		Year		
Material Category		Light Organics		
Number of Tanks		1		
Shell Height	[ft]	11.970		
Diameter [ft]	[ft]	5.330		
Maximum Liquid Height	[%] | [ft]	90.000	4.797	
Average Liquid Height	[%] | [ft]	50.000	2.665	
Minimum Liquid Height	[%] | [ft]	10.000	0.533	
Sum of Increases in Liquid Level	[ft/yr]	24.892		
Tank Volume	[gal] | [bbl]	1997.884	47.569	
Insulation		Uninsulated		
Bolted or Riveted Construction		False		
Vapor Balanced Tank		False		
Paint Characteristics				
Shell Color		Tan		
Shell Paint Condition		Average		
Roof Color				
Roof Paint Condition				
Roof Characteristics				
Type				
Diameter	[ft]	-		
Slope	[ft/ft]	-		
Breather Vent Settings				
Breather Vacuum Pressure	[psig]	-0.030		
Breather Vent Pressure	[psig]	0.030		

Loading Loss Parameters		
Cargo Carrier		-
Land Based Mode of Operation		-
Marine Based Mode of Operation		-
Control Efficiency	[%]	-
Truck Annual Leak Test Passed		-
Overall Reduction Efficiency	[%]	-

Meteorological Data				
Location		Elkins, WV		
Average Atmospheric Pressure	[psia]	13.690		
Maximum Average Temperature	[°F]	61.500		
Minimum Average Temperature	[°F]	39.000		
Solar Insolation	[BTU/ft^2*day]	1173.000		
Average Wind Speed	[mph]	4.500		
Tank Conditions				
Flashing Temperature	[°F]	60.398		
Maximum Liquid Surface Temperature	[°F]	60.398		
Average Liquid Surface Temperature	[°F]	53.322		
Known Liquid Bulk Temperature?		False		
Bulk Liquid Temperature	[°F]	51.974		
Net Throughput	[bbl/day] | [bbl/yr]	0.271	98.932	
Net Throughput Per Tank	[bbl/day] | [bbl/yr]	0.271	98.932	
Annual Turnovers Per Tank		5.838		
Residual Liquid	[bbl/day]	0.274		
Residual Liquid Per Tank	[bbl/day]	0.274		
Raoult's Law Used for Vapor Pressure Calc?		False		
Vapor Pressure @ Minimum Liquid Surface Temperature	[psia]	0.000		
Vapor Pressure @ Maximum Liquid Surface Temperature	[psia]	0.000		
Vapor Pressure @ Average Daily Liquid Surface Temperature	[psia]	0.000		
Tank Conditions				
Heated Tank?		-		

Flowsheet Information				
Tank Losses Block Name		Used Oil Tank T-007		
Tank Losses Block Inlet Stream		Used Oil Inlet		

Tank Characteristics				
Tank Type		Vertical Cylinder		
Time Frame		Year		
Material Category		Light Organics		
Number of Tanks		1		
Shell Height	[ft]	25.130		
Diameter [ft]	[ft]	5.330		
Maximum Liquid Height	[%] | [ft]	90.000	22.617	
Average Liquid Height	[%] | [ft]	50.000	12.565	
Minimum Liquid Height	[%] | [ft]	10.000	2.513	
Sum of Increases in Liquid Level	[ft/yr]	25.088		
Tank Volume	[gal] | [bbl]	4194.387	99.866	
Insulation		Uninsulated		
Bolted or Riveted Construction		False		
Vapor Balanced Tank		False		
Paint Characteristics				
Shell Color		Medium Grey		
Shell Paint Condition		Average		
Roof Color		Medium Grey		
Roof Paint Condition		Average		
Roof Characteristics				
Type		Cone		
Diameter	[ft]	-		
Slope	[ft/ft]	0.063		
Breather Vent Settings				
Breather Vacuum Pressure	[psig]	-0.030		
Breather Vent Pressure	[psig]	0.030		

Loading Loss Parameters		
Cargo Carrier		-
Land Based Mode of Operation		-
Marine Based Mode of Operation		-
Control Efficiency	[%]	-
Truck Annual Leak Test Passed		-
Overall Reduction Efficiency	[%]	-

Meteorological Data				
Location		Elkins, WV		
Average Atmospheric Pressure	[psia]	13.690		
Maximum Average Temperature	[°F]	61.500		
Minimum Average Temperature	[°F]	39.000		
Solar Insolation	[BTU/ft^2*day]	1173.000		
Average Wind Speed	[mph]	4.500		
Tank Conditions				
Flashing Temperature	[°F]	62.423		
Maximum Liquid Surface Temperature	[°F]	62.423		
Average Liquid Surface Temperature	[°F]	54.373		
Known Liquid Bulk Temperature?		False		
Bulk Liquid Temperature	[°F]	52.748		
Net Throughput	[bbl/day] | [bbl/yr]	0.273	99.710	
Net Throughput Per Tank	[bbl/day] | [bbl/yr]	0.273	99.710	
Annual Turnovers Per Tank		1.248		
Residual Liquid	[bbl/day]	0.274		
Residual Liquid Per Tank	[bbl/day]	0.274		
Raoult's Law Used for Vapor Pressure Calc?		False		
Vapor Pressure @ Minimum Liquid Surface Temperature	[psia]	0.000		
Vapor Pressure @ Maximum Liquid Surface Temperature	[psia]	0.000		
Vapor Pressure @ Average Daily Liquid Surface Temperature	[psia]	0.000		
Tank Conditions				
Heated Tank?		-		

Flowsheet Information		
Tank Losses Block Name		Used TEG Tank T-024
Tank Losses Block Inlet Stream		Used TEG Inlet

Tank Characteristics				
Tank Type		Horizontal Cylinder		
Time Frame		Year		
Material Category		Light Organics		
Number of Tanks		1		
Shell Height	[ft]	25.130		
Diameter [ft]	[ft]	5.330		
Maximum Liquid Height	[%] | [ft]	90.000	4.797	
Average Liquid Height	[%] | [ft]	50.000	2.665	
Minimum Liquid Height	[%] | [ft]	10.000	0.533	
Sum of Increases in Liquid Level	[ft/yr]	24.889		
Tank Volume	[gal] | [bbl]	4194.387	99.866	
Insulation		Uninsulated		
Bolted or Riveted Construction		False		
Vapor Balanced Tank		False		
Paint Characteristics				
Shell Color		Tan		
Shell Paint Condition		Average		
Roof Color				
Roof Paint Condition				
Roof Characteristics				
Type				
Diameter	[ft]	-		
Slope	[ft/ft]	-		
Breather Vent Settings				
Breather Vacuum Pressure	[psig]	-0.030		
Breather Vent Pressure	[psig]	0.030		

Loading Loss Parameters		
Cargo Carrier		-
Land Based Mode of Operation		-
Marine Based Mode of Operation		-
Control Efficiency	[%]	-
Truck Annual Leak Test Passed		-
Overall Reduction Efficiency	[%]	-

Meteorological Data				
Location		Elkins, WV		
Average Atmospheric Pressure	[psia]	13.690		
Maximum Average Temperature	[°F]	61.500		
Minimum Average Temperature	[°F]	39.000		
Solar Insolation	[BTU/ft^2*day]	1173.000		
Average Wind Speed	[mph]	4.500		
Tank Conditions				
Flashing Temperature	[°F]	60.281		
Maximum Liquid Surface Temperature	[°F]	60.281		
Average Liquid Surface Temperature	[°F]	53.095		
Known Liquid Bulk Temperature?		False		
Bulk Liquid Temperature	[°F]	51.974		
Net Throughput	[bbl/day] | [bbl/yr]	0.271	98.920	
Net Throughput Per Tank	[bbl/day] | [bbl/yr]	0.271	98.920	
Annual Turnovers Per Tank		5.837		
Residual Liquid	[bbl/day]	0.274		
Residual Liquid Per Tank	[bbl/day]	0.274		
Raoult's Law Used for Vapor Pressure Calc?		False		
Vapor Pressure @ Minimum Liquid Surface Temperature	[psia]	0.000		
Vapor Pressure @ Maximum Liquid Surface Temperature	[psia]	0.000		
Vapor Pressure @ Average Daily Liquid Surface Temperature	[psia]	0.000		
Tank Conditions				
Heated Tank?		-		

Emission Summary [Total]					
Component Subset	**Tank Losses**	Flashing Losses	Working Losses	Standing Losses	**Loading Losses**
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	**[ton/yr]**
VOCs	**0.000**	0.000	0.000	0.000	**-**
HAPs	**0.000**	0.000	0.000	0.000	**-**
BTEX	**0.000**	0.000	0.000	0.000	**-**
H2S	**0.000**	-	-	-	**-**

Emission Summary [Per Tank]					
Component Subset	**Tank Losses**	Flashing Losses	Working Losses	Standing Losses	**Loading Losses**
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	**[ton/yr]**
VOCs [C3+]	**0.000**	0.000	0.000	0.000	**-**
HAPs	**0.000**	0.000	0.000	0.000	**-**
BTEX	**0.000**	0.000	0.000	0.000	**-**
H2S	**0.000**	-	-	-	**-**

Stream Properties							
		Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
Molecular Weight	[lb/lbmol]	387.000	-	387.000	387.000	-	387.000
Net Ideal Gas Heating Value	[BTU/scf]	-	-	18968.677	18968.677	-	-
Standard Vapor Volumetric Flow	[scf/d]	-	0.000	0.000	0.000	-	-
Specific Gravity		0.831	-	-	-	-	0.825
Reid Vapor Pressure	[psi]	0.177	-	-	-	-	0.177
API Gravity		39.429	-	-	-	-	39.431
Standard Liquid Volumetric Flow	[bbl/d]	0.471	-	-	-	-	0.471

Stream Mass Flow [Total]							
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual	Total Emissions
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]
Nitrogen	0.000	0.000	0.000	0.000	-	0.000	0.000
CO2	0.000	0.000	0.000	0.000	-	0.000	0.000
Oxygen	0.000	0.000	0.000	0.000	-	0.000	0.000
Methane	0.000	0.000	0.000	0.000	-	0.000	0.000
Ethane	0.000	0.000	0.000	0.000	-	0.000	0.000
Propane	0.000	0.000	0.000	0.000	-	0.000	0.000
i-Butane	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Butane	0.000	0.000	0.000	0.000	-	0.000	0.000
i-Pentane	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Pentane	0.000	0.000	0.000	0.000	-	0.000	0.000
2,2-Dimethylpropane	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Hexane	0.000	0.000	0.000	0.000	-	0.000	0.000
Heptane	0.000	0.000	0.000	0.000	-	0.000	0.000
2,2,4-Trimethylpentane	0.000	0.000	0.000	0.000	-	0.000	0.000
Octane	0.000	0.000	0.000	0.000	-	0.000	0.000
Nonane	0.000	0.000	0.000	0.000	-	0.000	0.000
Decane	0.000	0.000	0.000	0.000	-	0.000	0.000
Benzene	0.000	0.000	0.000	0.000	-	0.000	0.000
Toluene	0.000	0.000	0.000	0.000	-	0.000	0.000
Ethylbenzene	0.000	0.000	0.000	0.000	-	0.000	0.000
o-Xylene	0.000	0.000	0.000	0.000	-	0.000	0.000
Water	0.000	0.000	0.000	0.000	-	0.000	0.000
Motor Oil	24.926	0.000	0.000	0.000	-	24.926	0.000
Ethylene Glycol	0.000	0.000	0.000	0.000	-	0.000	0.000
Methanol	0.000	0.000	0.000	0.000	-	0.000	0.000
Triethylene Glycol	0.000	0.000	0.000	0.000	-	0.000	0.000

Stream Compostion						
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
	[Mol%]	[Mol%]	[Mol%]	[Mol%]	[Mol%]	[Mol%]
Nitrogen	0.000	-	0.000	0.000	-	0.000
CO2	0.000	-	0.000	0.000	-	0.000
Oxygen	0.000	-	0.000	0.000	-	0.000
Methane	0.000	-	0.000	0.000	-	0.000
Ethane	0.000	-	0.000	0.000	-	0.000
Propane	0.000	-	0.000	0.000	-	0.000
i-Butane	0.000	-	0.000	0.000	-	0.000
n-Butane	0.000	-	0.000	0.000	-	0.000
i-Pentane	0.000	-	0.000	0.000	-	0.000
n-Pentane	0.000	-	0.000	0.000	-	0.000
2,2-Dimethylpropane	0.000	-	0.000	0.000	-	0.000
n-Hexane	0.000	-	0.000	0.000	-	0.000
Heptane	0.000	-	0.000	0.000	-	0.000
2,2,4-Trimethylpentane	0.000	-	0.000	0.000	-	0.000
Octane	0.000	-	0.000	0.000	-	0.000
Nonane	0.000	-	0.000	0.000	-	0.000
Decane	0.000	-	0.000	0.000	-	0.000
Benzene	0.000	-	0.000	0.000	-	0.000
Toluene	0.000	-	0.000	0.000	-	0.000
Ethylbenzene	0.000	-	0.000	0.000	-	0.000
o-Xylene	0.000	-	0.000	0.000	-	0.000
Water	0.000	-	0.000	0.000	-	0.000
Motor Oil	100.000	-	100.000	100.000	-	100.000
Ethylene Glycol	0.000	-	0.000	0.000	-	0.000
Methanol	0.000	-	0.000	0.000	-	0.000
Triethylene Glycol	0.000	-	0.000	0.000	-	0.000
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
	[Mass%]	[Mass%]	[Mass%]	[Mass%]	[Mass%]	[Mass%]
Nitrogen	0.000	-	0.000	0.000	-	0.000
CO2	0.000	-	0.000	0.000	-	0.000
Oxygen	0.000	-	0.000	0.000	-	0.000
Methane	0.000	-	0.000	0.000	-	0.000
Ethane	0.000	-	0.000	0.000	-	0.000
Propane	0.000	-	0.000	0.000	-	0.000
i-Butane	0.000	-	0.000	0.000	-	0.000
n-Butane	0.000	-	0.000	0.000	-	0.000
i-Pentane	0.000	-	0.000	0.000	-	0.000
n-Pentane	0.000	-	0.000	0.000	-	0.000
2,2-Dimethylpropane	0.000	-	0.000	0.000	-	0.000
n-Hexane	0.000	-	0.000	0.000	-	0.000
Heptane	0.000	-	0.000	0.000	-	0.000
2,2,4-Trimethylpentane	0.000	-	0.000	0.000	-	0.000
Octane	0.000	-	0.000	0.000	-	0.000
Nonane	0.000	-	0.000	0.000	-	0.000
Decane	0.000	-	0.000	0.000	-	0.000
Benzene	0.000	-	0.000	0.000	-	0.000
Toluene	0.000	-	0.000	0.000	-	0.000
Ethylbenzene	0.000	-	0.000	0.000	-	0.000
o-Xylene	0.000	-	0.000	0.000	-	0.000
Water	0.000	-	0.000	0.000	-	0.000
Motor Oil	100.000	-	100.000	100.000	-	100.000
Ethylene Glycol	0.000	-	0.000	0.000	-	0.000
Methanol	0.000	-	0.000	0.000	-	0.000
Triethylene Glycol	0.000	-	0.000	0.000	-	0.000

Emission Summary [Total]					
Component Subset	**Tank Losses**	Flashing Losses	Working Losses	Standing Losses	**Loading Losses**
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	**[ton/yr]**
VOCs	**0.000**	0.000	0.000	0.000	**-**
HAPs	**0.000**	0.000	0.000	0.000	**-**
BTEX	**0.000**	0.000	0.000	0.000	**-**
H2S	**0.000**	-	-	-	**-**

Emission Summary [Per Tank]					
Component Subset	**Tank Losses**	Flashing Losses	Working Losses	Standing Losses	**Loading Losses**
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	**[ton/yr]**
VOCs [C3+]	**0.000**	0.000	0.000	0.000	**-**
HAPs	**0.000**	0.000	0.000	0.000	**-**
BTEX	**0.000**	0.000	0.000	0.000	**-**
H2S	**0.000**	-	-	-	**-**

Stream Properties							
		Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
Molecular Weight	[lb/lbmol]	387.000	-	387.000	387.000	-	387.000
Net Ideal Gas Heating Value	[BTU/scf]	-	-	18968.677	18968.677	-	-
Standard Vapor Volumetric Flow	[scf/d]	-	0.000	0.000	0.000	-	-
Specific Gravity		0.831	-	-	-	-	0.828
Reid Vapor Pressure	[psi]	0.177	-	-	-	-	0.177
API Gravity		39.429	-	-	-	-	39.431
Standard Liquid Volumetric Flow	[bbl/d]	0.474	-	-	-	-	0.474

Stream Mass Flow [Total]							
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual	Total Emissions
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]
Nitrogen	0.000	0.000	0.000	0.000	-	0.000	0.000
CO2	0.000	0.000	0.000	0.000	-	0.000	0.000
Oxygen	0.000	0.000	0.000	0.000	-	0.000	0.000
Methane	0.000	0.000	0.000	0.000	-	0.000	0.000
Ethane	0.000	0.000	0.000	0.000	-	0.000	0.000
Propane	0.000	0.000	0.000	0.000	-	0.000	0.000
i-Butane	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Butane	0.000	0.000	0.000	0.000	-	0.000	0.000
i-Pentane	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Pentane	0.000	0.000	0.000	0.000	-	0.000	0.000
2,2-Dimethylpropane	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Hexane	0.000	0.000	0.000	0.000	-	0.000	0.000
Heptane	0.000	0.000	0.000	0.000	-	0.000	0.000
2,2,4-Trimethylpentane	0.000	0.000	0.000	0.000	-	0.000	0.000
Octane	0.000	0.000	0.000	0.000	-	0.000	0.000
Nonane	0.000	0.000	0.000	0.000	-	0.000	0.000
Decane	0.000	0.000	0.000	0.000	-	0.000	0.000
Benzene	0.000	0.000	0.000	0.000	-	0.000	0.000
Toluene	0.000	0.000	0.000	0.000	-	0.000	0.000
Ethylbenzene	0.000	0.000	0.000	0.000	-	0.000	0.000
o-Xylene	0.000	0.000	0.000	0.000	-	0.000	0.000
Water	0.000	0.000	0.000	0.000	-	0.000	0.000
Motor Oil	25.070	0.000	0.000	0.000	-	25.070	0.000
Ethylene Glycol	0.000	0.000	0.000	0.000	-	0.000	0.000
Methanol	0.000	0.000	0.000	0.000	-	0.000	0.000
Triethylene Glycol	0.000	0.000	0.000	0.000	-	0.000	0.000

Stream Compostion						
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
	[Mol%]	[Mol%]	[Mol%]	[Mol%]	[Mol%]	[Mol%]
Nitrogen	0.000	-	0.000	0.000	-	0.000
CO2	0.000	-	0.000	0.000	-	0.000
Oxygen	0.000	-	0.000	0.000	-	0.000
Methane	0.000	-	0.000	0.000	-	0.000
Ethane	0.000	-	0.000	0.000	-	0.000
Propane	0.000	-	0.000	0.000	-	0.000
i-Butane	0.000	-	0.000	0.000	-	0.000
n-Butane	0.000	-	0.000	0.000	-	0.000
i-Pentane	0.000	-	0.000	0.000	-	0.000
n-Pentane	0.000	-	0.000	0.000	-	0.000
2,2-Dimethylpropane	0.000	-	0.000	0.000	-	0.000
n-Hexane	0.000	-	0.000	0.000	-	0.000
Heptane	0.000	-	0.000	0.000	-	0.000
2,2,4-Trimethylpentane	0.000	-	0.000	0.000	-	0.000
Octane	0.000	-	0.000	0.000	-	0.000
Nonane	0.000	-	0.000	0.000	-	0.000
Decane	0.000	-	0.000	0.000	-	0.000
Benzene	0.000	-	0.000	0.000	-	0.000
Toluene	0.000	-	0.000	0.000	-	0.000
Ethylbenzene	0.000	-	0.000	0.000	-	0.000
o-Xylene	0.000	-	0.000	0.000	-	0.000
Water	0.000	-	0.000	0.000	-	0.000
Motor Oil	100.000	-	100.000	100.000	-	100.000
Ethylene Glycol	0.000	-	0.000	0.000	-	0.000
Methanol	0.000	-	0.000	0.000	-	0.000
Triethylene Glycol	0.000	-	0.000	0.000	-	0.000
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
	[Mass%]	[Mass%]	[Mass%]	[Mass%]	[Mass%]	[Mass%]
Nitrogen	0.000	-	0.000	0.000	-	0.000
CO2	0.000	-	0.000	0.000	-	0.000
Oxygen	0.000	-	0.000	0.000	-	0.000
Methane	0.000	-	0.000	0.000	-	0.000
Ethane	0.000	-	0.000	0.000	-	0.000
Propane	0.000	-	0.000	0.000	-	0.000
i-Butane	0.000	-	0.000	0.000	-	0.000
n-Butane	0.000	-	0.000	0.000	-	0.000
i-Pentane	0.000	-	0.000	0.000	-	0.000
n-Pentane	0.000	-	0.000	0.000	-	0.000
2,2-Dimethylpropane	0.000	-	0.000	0.000	-	0.000
n-Hexane	0.000	-	0.000	0.000	-	0.000
Heptane	0.000	-	0.000	0.000	-	0.000
2,2,4-Trimethylpentane	0.000	-	0.000	0.000	-	0.000
Octane	0.000	-	0.000	0.000	-	0.000
Nonane	0.000	-	0.000	0.000	-	0.000
Decane	0.000	-	0.000	0.000	-	0.000
Benzene	0.000	-	0.000	0.000	-	0.000
Toluene	0.000	-	0.000	0.000	-	0.000
Ethylbenzene	0.000	-	0.000	0.000	-	0.000
o-Xylene	0.000	-	0.000	0.000	-	0.000
Water	0.000	-	0.000	0.000	-	0.000
Motor Oil	100.000	-	100.000	100.000	-	100.000
Ethylene Glycol	0.000	-	0.000	0.000	-	0.000
Methanol	0.000	-	0.000	0.000	-	0.000
Triethylene Glycol	0.000	-	0.000	0.000	-	0.000

Emission Summary [Total]					
Component Subset	**Tank Losses**	Flashing Losses	Working Losses	Standing Losses	**Loading Losses**
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	**[ton/yr]**
VOCs	**0.000**	0.000	0.000	0.000	**-**
HAPs	**0.000**	0.000	0.000	0.000	**-**
BTEX	**0.000**	0.000	0.000	0.000	**-**
H2S	**0.000**	-	-	-	**-**

Emission Summary [Per Tank]					
Component Subset	**Tank Losses**	Flashing Losses	Working Losses	Standing Losses	**Loading Losses**
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	**[ton/yr]**
VOCs [C3+]	**0.000**	0.000	0.000	0.000	**-**
HAPs	**0.000**	0.000	0.000	0.000	**-**
BTEX	**0.000**	0.000	0.000	0.000	**-**
H2S	**0.000**	-	-	-	**-**

Stream Properties							
		Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
Molecular Weight	[lb/lbmol]	387.000	-	387.000	387.000	-	387.000
Net Ideal Gas Heating Value	[BTU/scf]	-	-	18968.677	18968.677	-	-
Standard Vapor Volumetric Flow	[scf/d]	-	0.000	0.000	0.000	-	-
Specific Gravity		0.831	-	-	-	-	0.825
Reid Vapor Pressure	[psi]	0.177	-	-	-	-	0.177
API Gravity		39.429	-	-	-	-	39.431
Standard Liquid Volumetric Flow	[bbl/d]	0.274	-	-	-	-	0.274

Stream Mass Flow [Total]							
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual	Total Emissions
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]
Nitrogen	0.000	0.000	0.000	0.000	-	0.000	0.000
CO2	0.000	0.000	0.000	0.000	-	0.000	0.000
Oxygen	0.000	0.000	0.000	0.000	-	0.000	0.000
Methane	0.000	0.000	0.000	0.000	-	0.000	0.000
Ethane	0.000	0.000	0.000	0.000	-	0.000	0.000
Propane	0.000	0.000	0.000	0.000	-	0.000	0.000
i-Butane	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Butane	0.000	0.000	0.000	0.000	-	0.000	0.000
i-Pentane	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Pentane	0.000	0.000	0.000	0.000	-	0.000	0.000
2,2-Dimethylpropane	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Hexane	0.000	0.000	0.000	0.000	-	0.000	0.000
Heptane	0.000	0.000	0.000	0.000	-	0.000	0.000
2,2,4-Trimethylpentane	0.000	0.000	0.000	0.000	-	0.000	0.000
Octane	0.000	0.000	0.000	0.000	-	0.000	0.000
Nonane	0.000	0.000	0.000	0.000	-	0.000	0.000
Decane	0.000	0.000	0.000	0.000	-	0.000	0.000
Benzene	0.000	0.000	0.000	0.000	-	0.000	0.000
Toluene	0.000	0.000	0.000	0.000	-	0.000	0.000
Ethylbenzene	0.000	0.000	0.000	0.000	-	0.000	0.000
o-Xylene	0.000	0.000	0.000	0.000	-	0.000	0.000
Water	0.000	0.000	0.000	0.000	-	0.000	0.000
Motor Oil	14.492	0.000	0.000	0.000	-	14.492	0.000
Ethylene Glycol	0.000	0.000	0.000	0.000	-	0.000	0.000
Methanol	0.000	0.000	0.000	0.000	-	0.000	0.000
Triethylene Glycol	0.000	0.000	0.000	0.000	-	0.000	0.000

Stream Compostion						
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
	[Mol%]	[Mol%]	[Mol%]	[Mol%]	[Mol%]	[Mol%]
Nitrogen	0.000	-	0.000	0.000	-	0.000
CO2	0.000	-	0.000	0.000	-	0.000
Oxygen	0.000	-	0.000	0.000	-	0.000
Methane	0.000	-	0.000	0.000	-	0.000
Ethane	0.000	-	0.000	0.000	-	0.000
Propane	0.000	-	0.000	0.000	-	0.000
i-Butane	0.000	-	0.000	0.000	-	0.000
n-Butane	0.000	-	0.000	0.000	-	0.000
i-Pentane	0.000	-	0.000	0.000	-	0.000
n-Pentane	0.000	-	0.000	0.000	-	0.000
2,2-Dimethylpropane	0.000	-	0.000	0.000	-	0.000
n-Hexane	0.000	-	0.000	0.000	-	0.000
Heptane	0.000	-	0.000	0.000	-	0.000
2,2,4-Trimethylpentane	0.000	-	0.000	0.000	-	0.000
Octane	0.000	-	0.000	0.000	-	0.000
Nonane	0.000	-	0.000	0.000	-	0.000
Decane	0.000	-	0.000	0.000	-	0.000
Benzene	0.000	-	0.000	0.000	-	0.000
Toluene	0.000	-	0.000	0.000	-	0.000
Ethylbenzene	0.000	-	0.000	0.000	-	0.000
o-Xylene	0.000	-	0.000	0.000	-	0.000
Water	0.000	-	0.000	0.000	-	0.000
Motor Oil	100.000	-	100.000	100.000	-	100.000
Ethylene Glycol	0.000	-	0.000	0.000	-	0.000
Methanol	0.000	-	0.000	0.000	-	0.000
Triethylene Glycol	0.000	-	0.000	0.000	-	0.000
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
	[Mass%]	[Mass%]	[Mass%]	[Mass%]	[Mass%]	[Mass%]
Nitrogen	0.000	-	0.000	0.000	-	0.000
CO2	0.000	-	0.000	0.000	-	0.000
Oxygen	0.000	-	0.000	0.000	-	0.000
Methane	0.000	-	0.000	0.000	-	0.000
Ethane	0.000	-	0.000	0.000	-	0.000
Propane	0.000	-	0.000	0.000	-	0.000
i-Butane	0.000	-	0.000	0.000	-	0.000
n-Butane	0.000	-	0.000	0.000	-	0.000
i-Pentane	0.000	-	0.000	0.000	-	0.000
n-Pentane	0.000	-	0.000	0.000	-	0.000
2,2-Dimethylpropane	0.000	-	0.000	0.000	-	0.000
n-Hexane	0.000	-	0.000	0.000	-	0.000
Heptane	0.000	-	0.000	0.000	-	0.000
2,2,4-Trimethylpentane	0.000	-	0.000	0.000	-	0.000
Octane	0.000	-	0.000	0.000	-	0.000
Nonane	0.000	-	0.000	0.000	-	0.000
Decane	0.000	-	0.000	0.000	-	0.000
Benzene	0.000	-	0.000	0.000	-	0.000
Toluene	0.000	-	0.000	0.000	-	0.000
Ethylbenzene	0.000	-	0.000	0.000	-	0.000
o-Xylene	0.000	-	0.000	0.000	-	0.000
Water	0.000	-	0.000	0.000	-	0.000
Motor Oil	100.000	-	100.000	100.000	-	100.000
Ethylene Glycol	0.000	-	0.000	0.000	-	0.000
Methanol	0.000	-	0.000	0.000	-	0.000
Triethylene Glycol	0.000	-	0.000	0.000	-	0.000

Emission Summary [Total]					
Component Subset	**Tank Losses**	Flashing Losses	Working Losses	Standing Losses	**Loading Losses**
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	**[ton/yr]**
VOCs	**0.000**	0.000	0.000	0.000	**-**
HAPs	**0.000**	0.000	0.000	0.000	**-**
BTEX	**0.000**	0.000	0.000	0.000	**-**
H2S	**0.000**	-	-	-	**-**

Emission Summary [Per Tank]					
Component Subset	**Tank Losses**	Flashing Losses	Working Losses	Standing Losses	**Loading Losses**
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	**[ton/yr]**
VOCs [C3+]	**0.000**	0.000	0.000	0.000	**-**
HAPs	**0.000**	0.000	0.000	0.000	**-**
BTEX	**0.000**	0.000	0.000	0.000	**-**
H2S	**0.000**	-	-	-	**-**

Stream Properties							
		Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
Molecular Weight	[lb/lbmol]	387.000	-	387.000	387.000	-	387.000
Net Ideal Gas Heating Value	[BTU/scf]	-	-	18968.677	18968.677	-	-
Standard Vapor Volumetric Flow	[scf/d]	-	0.000	0.000	0.000	-	-
Specific Gravity		0.831	-	-	-	-	0.828
Reid Vapor Pressure	[psi]	0.177	-	-	-	-	0.177
API Gravity		39.429	-	-	-	-	39.431
Standard Liquid Volumetric Flow	[bbl/d]	0.274	-	-	-	-	0.274

Stream Mass Flow [Total]							
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual	Total Emissions
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]
Nitrogen	0.000	0.000	0.000	0.000	-	0.000	0.000
CO2	0.000	0.000	0.000	0.000	-	0.000	0.000
Oxygen	0.000	0.000	0.000	0.000	-	0.000	0.000
Methane	0.000	0.000	0.000	0.000	-	0.000	0.000
Ethane	0.000	0.000	0.000	0.000	-	0.000	0.000
Propane	0.000	0.000	0.000	0.000	-	0.000	0.000
i-Butane	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Butane	0.000	0.000	0.000	0.000	-	0.000	0.000
i-Pentane	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Pentane	0.000	0.000	0.000	0.000	-	0.000	0.000
2,2-Dimethylpropane	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Hexane	0.000	0.000	0.000	0.000	-	0.000	0.000
Heptane	0.000	0.000	0.000	0.000	-	0.000	0.000
2,2,4-Trimethylpentane	0.000	0.000	0.000	0.000	-	0.000	0.000
Octane	0.000	0.000	0.000	0.000	-	0.000	0.000
Nonane	0.000	0.000	0.000	0.000	-	0.000	0.000
Decane	0.000	0.000	0.000	0.000	-	0.000	0.000
Benzene	0.000	0.000	0.000	0.000	-	0.000	0.000
Toluene	0.000	0.000	0.000	0.000	-	0.000	0.000
Ethylbenzene	0.000	0.000	0.000	0.000	-	0.000	0.000
o-Xylene	0.000	0.000	0.000	0.000	-	0.000	0.000
Water	0.000	0.000	0.000	0.000	-	0.000	0.000
Motor Oil	14.492	0.000	0.000	0.000	-	14.492	0.000
Ethylene Glycol	0.000	0.000	0.000	0.000	-	0.000	0.000
Methanol	0.000	0.000	0.000	0.000	-	0.000	0.000
Triethylene Glycol	0.000	0.000	0.000	0.000	-	0.000	0.000

Stream Compostion						
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
	[Mol%]	[Mol%]	[Mol%]	[Mol%]	[Mol%]	[Mol%]
Nitrogen	0.000	-	0.000	0.000	-	0.000
CO2	0.000	-	0.000	0.000	-	0.000
Oxygen	0.000	-	0.000	0.000	-	0.000
Methane	0.000	-	0.000	0.000	-	0.000
Ethane	0.000	-	0.000	0.000	-	0.000
Propane	0.000	-	0.000	0.000	-	0.000
i-Butane	0.000	-	0.000	0.000	-	0.000
n-Butane	0.000	-	0.000	0.000	-	0.000
i-Pentane	0.000	-	0.000	0.000	-	0.000
n-Pentane	0.000	-	0.000	0.000	-	0.000
2,2-Dimethylpropane	0.000	-	0.000	0.000	-	0.000
n-Hexane	0.000	-	0.000	0.000	-	0.000
Heptane	0.000	-	0.000	0.000	-	0.000
2,2,4-Trimethylpentane	0.000	-	0.000	0.000	-	0.000
Octane	0.000	-	0.000	0.000	-	0.000
Nonane	0.000	-	0.000	0.000	-	0.000
Decane	0.000	-	0.000	0.000	-	0.000
Benzene	0.000	-	0.000	0.000	-	0.000
Toluene	0.000	-	0.000	0.000	-	0.000
Ethylbenzene	0.000	-	0.000	0.000	-	0.000
o-Xylene	0.000	-	0.000	0.000	-	0.000
Water	0.000	-	0.000	0.000	-	0.000
Motor Oil	100.000	-	100.000	100.000	-	100.000
Ethylene Glycol	0.000	-	0.000	0.000	-	0.000
Methanol	0.000	-	0.000	0.000	-	0.000
Triethylene Glycol	0.000	-	0.000	0.000	-	0.000
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
	[Mass%]	[Mass%]	[Mass%]	[Mass%]	[Mass%]	[Mass%]
Nitrogen	0.000	-	0.000	0.000	-	0.000
CO2	0.000	-	0.000	0.000	-	0.000
Oxygen	0.000	-	0.000	0.000	-	0.000
Methane	0.000	-	0.000	0.000	-	0.000
Ethane	0.000	-	0.000	0.000	-	0.000
Propane	0.000	-	0.000	0.000	-	0.000
i-Butane	0.000	-	0.000	0.000	-	0.000
n-Butane	0.000	-	0.000	0.000	-	0.000
i-Pentane	0.000	-	0.000	0.000	-	0.000
n-Pentane	0.000	-	0.000	0.000	-	0.000
2,2-Dimethylpropane	0.000	-	0.000	0.000	-	0.000
n-Hexane	0.000	-	0.000	0.000	-	0.000
Heptane	0.000	-	0.000	0.000	-	0.000
2,2,4-Trimethylpentane	0.000	-	0.000	0.000	-	0.000
Octane	0.000	-	0.000	0.000	-	0.000
Nonane	0.000	-	0.000	0.000	-	0.000
Decane	0.000	-	0.000	0.000	-	0.000
Benzene	0.000	-	0.000	0.000	-	0.000
Toluene	0.000	-	0.000	0.000	-	0.000
Ethylbenzene	0.000	-	0.000	0.000	-	0.000
o-Xylene	0.000	-	0.000	0.000	-	0.000
Water	0.000	-	0.000	0.000	-	0.000
Motor Oil	100.000	-	100.000	100.000	-	100.000
Ethylene Glycol	0.000	-	0.000	0.000	-	0.000
Methanol	0.000	-	0.000	0.000	-	0.000
Triethylene Glycol	0.000	-	0.000	0.000	-	0.000

Emission Summary [Total]					
Component Subset	**Tank Losses**	Flashing Losses	Working Losses	Standing Losses	**Loading Losses**
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	**[ton/yr]**
VOCs	**0.000**	0.000	0.000	0.000	**-**
HAPs	**0.000**	0.000	0.000	0.000	**-**
BTEX	**0.000**	0.000	0.000	0.000	**-**
H2S	**0.000**	-	-	-	**-**

Emission Summary [Per Tank]					
Component Subset	**Tank Losses**	Flashing Losses	Working Losses	Standing Losses	**Loading Losses**
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	**[ton/yr]**
VOCs [C3+]	**0.000**	0.000	0.000	0.000	**-**
HAPs	**0.000**	0.000	0.000	0.000	**-**
BTEX	**0.000**	0.000	0.000	0.000	**-**
H2S	**0.000**	-	-	-	**-**

Stream Properties							
		Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
Molecular Weight	[lb/lbmol]	62.068	-	62.068	62.068	-	62.068
Net Ideal Gas Heating Value	[BTU/scf]	-	-	1273.907	1273.907	-	-
Standard Vapor Volumetric Flow	[scf/d]	-	0.000	0.000	0.000	-	-
Specific Gravity		1.123	-	-	-	-	1.119
Reid Vapor Pressure	[psi]	0.109	-	-	-	-	0.109
API Gravity		-5.033	-	-	-	-	-5.033
Standard Liquid Volumetric Flow	[bbl/d]	0.137	-	-	-	-	0.137

Stream Mass Flow [Total]							
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual	Total Emissions
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]
Nitrogen	0.000	0.000	0.000	0.000	-	0.000	0.000
CO2	0.000	0.000	0.000	0.000	-	0.000	0.000
Oxygen	0.000	0.000	0.000	0.000	-	0.000	0.000
Methane	0.000	0.000	0.000	0.000	-	0.000	0.000
Ethane	0.000	0.000	0.000	0.000	-	0.000	0.000
Propane	0.000	0.000	0.000	0.000	-	0.000	0.000
i-Butane	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Butane	0.000	0.000	0.000	0.000	-	0.000	0.000
i-Pentane	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Pentane	0.000	0.000	0.000	0.000	-	0.000	0.000
2,2-Dimethylpropane	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Hexane	0.000	0.000	0.000	0.000	-	0.000	0.000
Heptane	0.000	0.000	0.000	0.000	-	0.000	0.000
2,2,4-Trimethylpentane	0.000	0.000	0.000	0.000	-	0.000	0.000
Octane	0.000	0.000	0.000	0.000	-	0.000	0.000
Nonane	0.000	0.000	0.000	0.000	-	0.000	0.000
Decane	0.000	0.000	0.000	0.000	-	0.000	0.000
Benzene	0.000	0.000	0.000	0.000	-	0.000	0.000
Toluene	0.000	0.000	0.000	0.000	-	0.000	0.000
Ethylbenzene	0.000	0.000	0.000	0.000	-	0.000	0.000
o-Xylene	0.000	0.000	0.000	0.000	-	0.000	0.000
Water	0.000	0.000	0.000	0.000	-	0.000	0.000
Motor Oil	0.000	0.000	0.000	0.000	-	0.000	0.000
Ethylene Glycol	9.773	0.000	0.000	0.000	-	9.773	0.000
Methanol	0.000	0.000	0.000	0.000	-	0.000	0.000
Triethylene Glycol	0.000	0.000	0.000	0.000	-	0.000	0.000

Stream Compostion						
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
	[Mol%]	[Mol%]	[Mol%]	[Mol%]	[Mol%]	[Mol%]
Nitrogen	0.000	-	0.000	0.000	-	0.000
CO2	0.000	-	0.000	0.000	-	0.000
Oxygen	0.000	-	0.000	0.000	-	0.000
Methane	0.000	-	0.000	0.000	-	0.000
Ethane	0.000	-	0.000	0.000	-	0.000
Propane	0.000	-	0.000	0.000	-	0.000
i-Butane	0.000	-	0.000	0.000	-	0.000
n-Butane	0.000	-	0.000	0.000	-	0.000
i-Pentane	0.000	-	0.000	0.000	-	0.000
n-Pentane	0.000	-	0.000	0.000	-	0.000
2,2-Dimethylpropane	0.000	-	0.000	0.000	-	0.000
n-Hexane	0.000	-	0.000	0.000	-	0.000
Heptane	0.000	-	0.000	0.000	-	0.000
2,2,4-Trimethylpentane	0.000	-	0.000	0.000	-	0.000
Octane	0.000	-	0.000	0.000	-	0.000
Nonane	0.000	-	0.000	0.000	-	0.000
Decane	0.000	-	0.000	0.000	-	0.000
Benzene	0.000	-	0.000	0.000	-	0.000
Toluene	0.000	-	0.000	0.000	-	0.000
Ethylbenzene	0.000	-	0.000	0.000	-	0.000
o-Xylene	0.000	-	0.000	0.000	-	0.000
Water	0.000	-	0.000	0.000	-	0.000
Motor Oil	0.000	-	0.000	0.000	-	0.000
Ethylene Glycol	100.000	-	100.000	100.000	-	100.000
Methanol	0.000	-	0.000	0.000	-	0.000
Triethylene Glycol	0.000	-	0.000	0.000	-	0.000
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
	[Mass%]	[Mass%]	[Mass%]	[Mass%]	[Mass%]	[Mass%]
Nitrogen	0.000	-	0.000	0.000	-	0.000
CO2	0.000	-	0.000	0.000	-	0.000
Oxygen	0.000	-	0.000	0.000	-	0.000
Methane	0.000	-	0.000	0.000	-	0.000
Ethane	0.000	-	0.000	0.000	-	0.000
Propane	0.000	-	0.000	0.000	-	0.000
i-Butane	0.000	-	0.000	0.000	-	0.000
n-Butane	0.000	-	0.000	0.000	-	0.000
i-Pentane	0.000	-	0.000	0.000	-	0.000
n-Pentane	0.000	-	0.000	0.000	-	0.000
2,2-Dimethylpropane	0.000	-	0.000	0.000	-	0.000
n-Hexane	0.000	-	0.000	0.000	-	0.000
Heptane	0.000	-	0.000	0.000	-	0.000
2,2,4-Trimethylpentane	0.000	-	0.000	0.000	-	0.000
Octane	0.000	-	0.000	0.000	-	0.000
Nonane	0.000	-	0.000	0.000	-	0.000
Decane	0.000	-	0.000	0.000	-	0.000
Benzene	0.000	-	0.000	0.000	-	0.000
Toluene	0.000	-	0.000	0.000	-	0.000
Ethylbenzene	0.000	-	0.000	0.000	-	0.000
o-Xylene	0.000	-	0.000	0.000	-	0.000
Water	0.000	-	0.000	0.000	-	0.000
Motor Oil	0.000	-	0.000	0.000	-	0.000
Ethylene Glycol	100.000	-	100.000	100.000	-	100.000
Methanol	0.000	-	0.000	0.000	-	0.000
Triethylene Glycol	0.000	-	0.000	0.000	-	0.000

Emission Summary [Total]					
Component Subset	**Tank Losses**	Flashing Losses	Working Losses	Standing Losses	**Loading Losses**
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	**[ton/yr]**
VOCs	**0.000**	0.000	0.000	0.000	**-**
HAPs	**0.000**	0.000	0.000	0.000	**-**
BTEX	**0.000**	0.000	0.000	0.000	**-**
H2S	**0.000**	-	-	-	**-**

Emission Summary [Per Tank]					
Component Subset	**Tank Losses**	Flashing Losses	Working Losses	Standing Losses	**Loading Losses**
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	**[ton/yr]**
VOCs [C3+]	**0.000**	0.000	0.000	0.000	**-**
HAPs	**0.000**	0.000	0.000	0.000	**-**
BTEX	**0.000**	0.000	0.000	0.000	**-**
H2S	**0.000**	-	-	-	**-**

Stream Properties							
		Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
Molecular Weight	[lb/lbmol]	150.173	-	150.173	150.173	-	150.173
Net Ideal Gas Heating Value	[BTU/scf]	-	-	3777.008	3777.008	-	-
Standard Vapor Volumetric Flow	[scf/d]	-	0.000	0.000	0.000	-	-
Specific Gravity		1.142	-	-	-	-	1.138
Reid Vapor Pressure	[psi]	0.110	-	-	-	-	0.110
API Gravity		-7.137	-	-	-	-	-7.137
Standard Liquid Volumetric Flow	[bbl/d]	0.274	-	-	-	-	0.274

Stream Mass Flow [Total]							
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual	Total Emissions
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]
Nitrogen	0.000	0.000	0.000	0.000	-	0.000	0.000
CO2	0.000	0.000	0.000	0.000	-	0.000	0.000
Oxygen	0.000	0.000	0.000	0.000	-	0.000	0.000
Methane	0.000	0.000	0.000	0.000	-	0.000	0.000
Ethane	0.000	0.000	0.000	0.000	-	0.000	0.000
Propane	0.000	0.000	0.000	0.000	-	0.000	0.000
i-Butane	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Butane	0.000	0.000	0.000	0.000	-	0.000	0.000
i-Pentane	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Pentane	0.000	0.000	0.000	0.000	-	0.000	0.000
2,2-Dimethylpropane	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Hexane	0.000	0.000	0.000	0.000	-	0.000	0.000
Heptane	0.000	0.000	0.000	0.000	-	0.000	0.000
2,2,4-Trimethylpentane	0.000	0.000	0.000	0.000	-	0.000	0.000
Octane	0.000	0.000	0.000	0.000	-	0.000	0.000
Nonane	0.000	0.000	0.000	0.000	-	0.000	0.000
Decane	0.000	0.000	0.000	0.000	-	0.000	0.000
Benzene	0.000	0.000	0.000	0.000	-	0.000	0.000
Toluene	0.000	0.000	0.000	0.000	-	0.000	0.000
Ethylbenzene	0.000	0.000	0.000	0.000	-	0.000	0.000
o-Xylene	0.000	0.000	0.000	0.000	-	0.000	0.000
Water	0.000	0.000	0.000	0.000	-	0.000	0.000
Motor Oil	0.000	0.000	0.000	0.000	-	0.000	0.000
Ethylene Glycol	0.000	0.000	0.000	0.000	-	0.000	0.000
Methanol	0.000	0.000	0.000	0.000	-	0.000	0.000
Triethylene Glycol	19.777	0.000	0.000	0.000	-	0.000	0.000

Stream Compostion						
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
	[Mol%]	[Mol%]	[Mol%]	[Mol%]	[Mol%]	[Mol%]
Nitrogen	0.000	-	0.000	0.000	-	0.000
CO2	0.000	-	0.000	0.000	-	0.000
Oxygen	0.000	-	0.000	0.000	-	0.000
Methane	0.000	-	0.000	0.000	-	0.000
Ethane	0.000	-	0.000	0.000	-	0.000
Propane	0.000	-	0.000	0.000	-	0.000
i-Butane	0.000	-	0.000	0.000	-	0.000
n-Butane	0.000	-	0.000	0.000	-	0.000
i-Pentane	0.000	-	0.000	0.000	-	0.000
n-Pentane	0.000	-	0.000	0.000	-	0.000
2,2-Dimethylpropane	0.000	-	0.000	0.000	-	0.000
n-Hexane	0.000	-	0.000	0.000	-	0.000
Heptane	0.000	-	0.000	0.000	-	0.000
2,2,4-Trimethylpentane	0.000	-	0.000	0.000	-	0.000
Octane	0.000	-	0.000	0.000	-	0.000
Nonane	0.000	-	0.000	0.000	-	0.000
Decane	0.000	-	0.000	0.000	-	0.000
Benzene	0.000	-	0.000	0.000	-	0.000
Toluene	0.000	-	0.000	0.000	-	0.000
Ethylbenzene	0.000	-	0.000	0.000	-	0.000
o-Xylene	0.000	-	0.000	0.000	-	0.000
Water	0.000	-	0.000	0.000	-	0.000
Motor Oil	0.000	-	0.000	0.000	-	0.000
Ethylene Glycol	0.000	-	0.000	0.000	-	0.000
Methanol	0.000	-	0.000	0.000	-	0.000
Triethylene Glycol	100.000	-	100.000	100.000	-	100.000
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
	[Mass%]	[Mass%]	[Mass%]	[Mass%]	[Mass%]	[Mass%]
Nitrogen	0.000	-	0.000	0.000	-	0.000
CO2	0.000	-	0.000	0.000	-	0.000
Oxygen	0.000	-	0.000	0.000	-	0.000
Methane	0.000	-	0.000	0.000	-	0.000
Ethane	0.000	-	0.000	0.000	-	0.000
Propane	0.000	-	0.000	0.000	-	0.000
i-Butane	0.000	-	0.000	0.000	-	0.000
n-Butane	0.000	-	0.000	0.000	-	0.000
i-Pentane	0.000	-	0.000	0.000	-	0.000
n-Pentane	0.000	-	0.000	0.000	-	0.000
2,2-Dimethylpropane	0.000	-	0.000	0.000	-	0.000
n-Hexane	0.000	-	0.000	0.000	-	0.000
Heptane	0.000	-	0.000	0.000	-	0.000
2,2,4-Trimethylpentane	0.000	-	0.000	0.000	-	0.000
Octane	0.000	-	0.000	0.000	-	0.000
Nonane	0.000	-	0.000	0.000	-	0.000
Decane	0.000	-	0.000	0.000	-	0.000
Benzene	0.000	-	0.000	0.000	-	0.000
Toluene	0.000	-	0.000	0.000	-	0.000
Ethylbenzene	0.000	-	0.000	0.000	-	0.000
o-Xylene	0.000	-	0.000	0.000	-	0.000
Water	0.000	-	0.000	0.000	-	0.000
Motor Oil	0.000	-	0.000	0.000	-	0.000
Ethylene Glycol	0.000	-	0.000	0.000	-	0.000
Methanol	0.000	-	0.000	0.000	-	0.000
Triethylene Glycol	100.000	-	100.000	100.000	-	100.000

Emission Summary [Total]					
Component Subset	**Tank Losses**	Flashing Losses	Working Losses	Standing Losses	**Loading Losses**
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	**[ton/yr]**
VOCs	**0.000**	0.000	0.000	0.000	**-**
HAPs	**0.000**	0.000	0.000	0.000	**-**
BTEX	**0.000**	0.000	0.000	0.000	**-**
H2S	**0.000**	-	-	-	**-**

Emission Summary [Per Tank]					
Component Subset	**Tank Losses**	Flashing Losses	Working Losses	Standing Losses	**Loading Losses**
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	**[ton/yr]**
VOCs [C3+]	**0.000**	0.000	0.000	0.000	**-**
HAPs	**0.000**	0.000	0.000	0.000	**-**
BTEX	**0.000**	0.000	0.000	0.000	**-**
H2S	**0.000**	-	-	-	**-**

Stream Properties							
		Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
Molecular Weight	[lb/lbmol]	387.000	-	387.000	387.000	-	387.000
Net Ideal Gas Heating Value	[BTU/scf]	-	-	18968.677	18968.677	-	-
Standard Vapor Volumetric Flow	[scf/d]	-	0.000	0.000	0.000	-	-
Specific Gravity		0.831	-	-	-	-	0.827
Reid Vapor Pressure	[psi]	0.177	-	-	-	-	0.177
API Gravity		39.429	-	-	-	-	39.431
Standard Liquid Volumetric Flow	[bbl/d]	0.274	-	-	-	-	0.274

Stream Mass Flow [Total]							
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual	Total Emissions
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]
Nitrogen	0.000	0.000	0.000	0.000	-	0.000	0.000
CO2	0.000	0.000	0.000	0.000	-	0.000	0.000
Oxygen	0.000	0.000	0.000	0.000	-	0.000	0.000
Methane	0.000	0.000	0.000	0.000	-	0.000	0.000
Ethane	0.000	0.000	0.000	0.000	-	0.000	0.000
Propane	0.000	0.000	0.000	0.000	-	0.000	0.000
i-Butane	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Butane	0.000	0.000	0.000	0.000	-	0.000	0.000
i-Pentane	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Pentane	0.000	0.000	0.000	0.000	-	0.000	0.000
2,2-Dimethylpropane	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Hexane	0.000	0.000	0.000	0.000	-	0.000	0.000
Heptane	0.000	0.000	0.000	0.000	-	0.000	0.000
2,2,4-Trimethylpentane	0.000	0.000	0.000	0.000	-	0.000	0.000
Octane	0.000	0.000	0.000	0.000	-	0.000	0.000
Nonane	0.000	0.000	0.000	0.000	-	0.000	0.000
Decane	0.000	0.000	0.000	0.000	-	0.000	0.000
Benzene	0.000	0.000	0.000	0.000	-	0.000	0.000
Toluene	0.000	0.000	0.000	0.000	-	0.000	0.000
Ethylbenzene	0.000	0.000	0.000	0.000	-	0.000	0.000
o-Xylene	0.000	0.000	0.000	0.000	-	0.000	0.000
Water	0.000	0.000	0.000	0.000	-	0.000	0.000
Motor Oil	14.492	0.000	0.000	0.000	-	14.492	0.000
Ethylene Glycol	0.000	0.000	0.000	0.000	-	0.000	0.000
Methanol	0.000	0.000	0.000	0.000	-	0.000	0.000
Triethylene Glycol	0.000	0.000	0.000	0.000	-	0.000	0.000

Stream Compostion						
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
	[Mol%]	[Mol%]	[Mol%]	[Mol%]	[Mol%]	[Mol%]
Nitrogen	0.000	-	0.000	0.000	-	0.000
CO2	0.000	-	0.000	0.000	-	0.000
Oxygen	0.000	-	0.000	0.000	-	0.000
Methane	0.000	-	0.000	0.000	-	0.000
Ethane	0.000	-	0.000	0.000	-	0.000
Propane	0.000	-	0.000	0.000	-	0.000
i-Butane	0.000	-	0.000	0.000	-	0.000
n-Butane	0.000	-	0.000	0.000	-	0.000
i-Pentane	0.000	-	0.000	0.000	-	0.000
n-Pentane	0.000	-	0.000	0.000	-	0.000
2,2-Dimethylpropane	0.000	-	0.000	0.000	-	0.000
n-Hexane	0.000	-	0.000	0.000	-	0.000
Heptane	0.000	-	0.000	0.000	-	0.000
2,2,4-Trimethylpentane	0.000	-	0.000	0.000	-	0.000
Octane	0.000	-	0.000	0.000	-	0.000
Nonane	0.000	-	0.000	0.000	-	0.000
Decane	0.000	-	0.000	0.000	-	0.000
Benzene	0.000	-	0.000	0.000	-	0.000
Toluene	0.000	-	0.000	0.000	-	0.000
Ethylbenzene	0.000	-	0.000	0.000	-	0.000
o-Xylene	0.000	-	0.000	0.000	-	0.000
Water	0.000	-	0.000	0.000	-	0.000
Motor Oil	100.000	-	100.000	100.000	-	100.000
Ethylene Glycol	0.000	-	0.000	0.000	-	0.000
Methanol	0.000	-	0.000	0.000	-	0.000
Triethylene Glycol	0.000	-	0.000	0.000	-	0.000
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
	[Mass%]	[Mass%]	[Mass%]	[Mass%]	[Mass%]	[Mass%]
Nitrogen	0.000	-	0.000	0.000	-	0.000
CO2	0.000	-	0.000	0.000	-	0.000
Oxygen	0.000	-	0.000	0.000	-	0.000
Methane	0.000	-	0.000	0.000	-	0.000
Ethane	0.000	-	0.000	0.000	-	0.000
Propane	0.000	-	0.000	0.000	-	0.000
i-Butane	0.000	-	0.000	0.000	-	0.000
n-Butane	0.000	-	0.000	0.000	-	0.000
i-Pentane	0.000	-	0.000	0.000	-	0.000
n-Pentane	0.000	-	0.000	0.000	-	0.000
2,2-Dimethylpropane	0.000	-	0.000	0.000	-	0.000
n-Hexane	0.000	-	0.000	0.000	-	0.000
Heptane	0.000	-	0.000	0.000	-	0.000
2,2,4-Trimethylpentane	0.000	-	0.000	0.000	-	0.000
Octane	0.000	-	0.000	0.000	-	0.000
Nonane	0.000	-	0.000	0.000	-	0.000
Decane	0.000	-	0.000	0.000	-	0.000
Benzene	0.000	-	0.000	0.000	-	0.000
Toluene	0.000	-	0.000	0.000	-	0.000
Ethylbenzene	0.000	-	0.000	0.000	-	0.000
o-Xylene	0.000	-	0.000	0.000	-	0.000
Water	0.000	-	0.000	0.000	-	0.000
Motor Oil	100.000	-	100.000	100.000	-	100.000
Ethylene Glycol	0.000	-	0.000	0.000	-	0.000
Methanol	0.000	-	0.000	0.000	-	0.000
Triethylene Glycol	0.000	-	0.000	0.000	-	0.000

Emission Summary [Total]					
Component Subset	**Tank Losses**	Flashing Losses	Working Losses	Standing Losses	**Loading Losses**
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	**[ton/yr]**
VOCs	**0.000**	0.000	0.000	0.000	**-**
HAPs	**0.000**	0.000	0.000	0.000	**-**
BTEX	**0.000**	0.000	0.000	0.000	**-**
H2S	**0.000**	-	-	-	**-**

Emission Summary [Per Tank]					
Component Subset	**Tank Losses**	Flashing Losses	Working Losses	Standing Losses	**Loading Losses**
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	**[ton/yr]**
VOCs [C3+]	**0.000**	0.000	0.000	0.000	**-**
HAPs	**0.000**	0.000	0.000	0.000	**-**
BTEX	**0.000**	0.000	0.000	0.000	**-**
H2S	**0.000**	-	-	-	**-**

Stream Properties							
		Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
Molecular Weight	[lb/lbmol]	150.173	-	150.173	150.173	-	150.173
Net Ideal Gas Heating Value	[BTU/scf]	-	-	3777.008	3777.008	-	-
Standard Vapor Volumetric Flow	[scf/d]	-	0.000	0.000	0.000	-	-
Specific Gravity		1.142	-	-	-	-	1.138
Reid Vapor Pressure	[psi]	0.110	-	-	-	-	0.110
API Gravity		-7.137	-	-	-	-	-7.137
Standard Liquid Volumetric Flow	[bbl/d]	0.274	-	-	-	-	0.274

Stream Mass Flow [Total]							
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual	Total Emissions
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]
Nitrogen	0.000	0.000	0.000	0.000	-	0.000	0.000
CO2	0.000	0.000	0.000	0.000	-	0.000	0.000
Oxygen	0.000	0.000	0.000	0.000	-	0.000	0.000
Methane	0.000	0.000	0.000	0.000	-	0.000	0.000
Ethane	0.000	0.000	0.000	0.000	-	0.000	0.000
Propane	0.000	0.000	0.000	0.000	-	0.000	0.000
i-Butane	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Butane	0.000	0.000	0.000	0.000	-	0.000	0.000
i-Pentane	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Pentane	0.000	0.000	0.000	0.000	-	0.000	0.000
2,2-Dimethylpropane	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Hexane	0.000	0.000	0.000	0.000	-	0.000	0.000
Heptane	0.000	0.000	0.000	0.000	-	0.000	0.000
2,2,4-Trimethylpentane	0.000	0.000	0.000	0.000	-	0.000	0.000
Octane	0.000	0.000	0.000	0.000	-	0.000	0.000
Nonane	0.000	0.000	0.000	0.000	-	0.000	0.000
Decane	0.000	0.000	0.000	0.000	-	0.000	0.000
Benzene	0.000	0.000	0.000	0.000	-	0.000	0.000
Toluene	0.000	0.000	0.000	0.000	-	0.000	0.000
Ethylbenzene	0.000	0.000	0.000	0.000	-	0.000	0.000
o-Xylene	0.000	0.000	0.000	0.000	-	0.000	0.000
Water	0.000	0.000	0.000	0.000	-	0.000	0.000
Motor Oil	0.000	0.000	0.000	0.000	-	0.000	0.000
Ethylene Glycol	0.000	0.000	0.000	0.000	-	0.000	0.000
Methanol	0.000	0.000	0.000	0.000	-	0.000	0.000
Triethylene Glycol	19.777	0.000	0.000	0.000	-	0.000	0.000

Stream Compostion						
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
	[Mol%]	[Mol%]	[Mol%]	[Mol%]	[Mol%]	[Mol%]
Nitrogen	0.000	-	0.000	0.000	-	0.000
CO2	0.000	-	0.000	0.000	-	0.000
Oxygen	0.000	-	0.000	0.000	-	0.000
Methane	0.000	-	0.000	0.000	-	0.000
Ethane	0.000	-	0.000	0.000	-	0.000
Propane	0.000	-	0.000	0.000	-	0.000
i-Butane	0.000	-	0.000	0.000	-	0.000
n-Butane	0.000	-	0.000	0.000	-	0.000
i-Pentane	0.000	-	0.000	0.000	-	0.000
n-Pentane	0.000	-	0.000	0.000	-	0.000
2,2-Dimethylpropane	0.000	-	0.000	0.000	-	0.000
n-Hexane	0.000	-	0.000	0.000	-	0.000
Heptane	0.000	-	0.000	0.000	-	0.000
2,2,4-Trimethylpentane	0.000	-	0.000	0.000	-	0.000
Octane	0.000	-	0.000	0.000	-	0.000
Nonane	0.000	-	0.000	0.000	-	0.000
Decane	0.000	-	0.000	0.000	-	0.000
Benzene	0.000	-	0.000	0.000	-	0.000
Toluene	0.000	-	0.000	0.000	-	0.000
Ethylbenzene	0.000	-	0.000	0.000	-	0.000
o-Xylene	0.000	-	0.000	0.000	-	0.000
Water	0.000	-	0.000	0.000	-	0.000
Motor Oil	0.000	-	0.000	0.000	-	0.000
Ethylene Glycol	0.000	-	0.000	0.000	-	0.000
Methanol	0.000	-	0.000	0.000	-	0.000
Triethylene Glycol	100.000	-	100.000	100.000	-	100.000
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
	[Mass%]	[Mass%]	[Mass%]	[Mass%]	[Mass%]	[Mass%]
Nitrogen	0.000	-	0.000	0.000	-	0.000
CO2	0.000	-	0.000	0.000	-	0.000
Oxygen	0.000	-	0.000	0.000	-	0.000
Methane	0.000	-	0.000	0.000	-	0.000
Ethane	0.000	-	0.000	0.000	-	0.000
Propane	0.000	-	0.000	0.000	-	0.000
i-Butane	0.000	-	0.000	0.000	-	0.000
n-Butane	0.000	-	0.000	0.000	-	0.000
i-Pentane	0.000	-	0.000	0.000	-	0.000
n-Pentane	0.000	-	0.000	0.000	-	0.000
2,2-Dimethylpropane	0.000	-	0.000	0.000	-	0.000
n-Hexane	0.000	-	0.000	0.000	-	0.000
Heptane	0.000	-	0.000	0.000	-	0.000
2,2,4-Trimethylpentane	0.000	-	0.000	0.000	-	0.000
Octane	0.000	-	0.000	0.000	-	0.000
Nonane	0.000	-	0.000	0.000	-	0.000
Decane	0.000	-	0.000	0.000	-	0.000
Benzene	0.000	-	0.000	0.000	-	0.000
Toluene	0.000	-	0.000	0.000	-	0.000
Ethylbenzene	0.000	-	0.000	0.000	-	0.000
o-Xylene	0.000	-	0.000	0.000	-	0.000
Water	0.000	-	0.000	0.000	-	0.000
Motor Oil	0.000	-	0.000	0.000	-	0.000
Ethylene Glycol	0.000	-	0.000	0.000	-	0.000
Methanol	0.000	-	0.000	0.000	-	0.000
Triethylene Glycol	100.000	-	100.000	100.000	-	100.000

GRI-GLYCalc VERSION 4.0 - SUMMARY OF INPUT VALUES

Case Name: Janus Compressor Station
File Name: P:\330-000\334-808\-Draft Documents\Title V Renewal Application\Att I - Emission Calculations\Glycalc\Janus Dehydrators.ddf
Date: January 10, 2024

DESCRIPTION:

Description: 152 MMSCFD TEG Dehydrator

Annual Hours of Operation: 8760.0 hours/yr

WET GAS:

Temperature: 75.00 deg. F
Pressure: 1200.00 psig
Wet Gas Water Content: Saturated

Component	Conc. (vol %)
Carbon Dioxide	0.1535
Nitrogen	0.5227
Methane	79.5809
Ethane	13.8178
Propane	3.9010
Isobutane	0.5018
n-Butane	0.9196
Isopentane	0.2303
n-Pentane	0.2056
n-Hexane	0.0239
Other Hexanes	0.1031
Heptanes	0.0111
2,2,4-Trimethylpentane	0.0043
Benzene	0.0053
Toluene	0.0046
Ethylbenzene	0.0002
Xylenes	0.0012
C8+ Heavies	0.0077

DRY GAS:

Flow Rate: 152.0 MMSCF/day
Water Content: 7.0 lbs. H2O/MMSCF

LEAN GLYCOL:

Glycol Type: TEG
Water Content: 1.5 wt% H2O
Flow Rate: 18.8 gpm

PUMP:

Glycol Pump Type: Electric/Pneumatic

FLASH TANK:

Flash Control:	Combustion device
Flash Control Efficiency:	98.00 %
Temperature:	135.0 deg. F
Pressure:	35.0 psig

REGENERATOR OVERHEADS CONTROL DEVICE:

Control Device:	Combustion Device
Destruction Efficiency:	98.0 %
Excess Oxygen:	10.0 %
Ambient Air Temperature:	70.0 deg. F

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: Janus Compressor Station
File Name: P:\330-000\334-808\-Draft Documents\Title V Renewal Application\Att I - Emission Calculations\Glycalc\Janus Dehydrators.ddf
Date: January 10, 2024

DESCRIPTION:

Description: 152 MMSCFD TEG Dehydrator

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

CONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.0225	0.541	0.0986
Ethane	0.0646	1.551	0.2831
Propane	0.0664	1.594	0.2909
Isobutane	0.0192	0.461	0.0842
n-Butane	0.0553	1.328	0.2423
Isopentane	0.0164	0.394	0.0719
n-Pentane	0.0219	0.524	0.0957
n-Hexane	0.0059	0.142	0.0258
Other Hexanes	0.0173	0.416	0.0759
Heptanes	0.0067	0.160	0.0293
2,2,4-Trimethylpentane	0.0009	0.021	0.0039
Benzene	0.1064	2.554	0.4660
Toluene	0.1427	3.425	0.6251
Ethylbenzene	0.0078	0.187	0.0341
Xylenes	0.0649	1.557	0.2842
C8+ Heavies	0.0091	0.218	0.0397
Total Emissions	0.6280	15.072	2.7507
Total Hydrocarbon Emissions	0.6280	15.072	2.7507
Total VOC Emissions	0.5409	12.981	2.3690
Total HAP Emissions	0.3286	7.885	1.4391
Total BTEX Emissions	0.3218	7.723	1.4094

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	1.1261	27.026	4.9322
Ethane	3.2317	77.561	14.1550
Propane	3.3210	79.705	14.5461
Isobutane	0.9609	23.061	4.2087
n-Butane	2.7657	66.377	12.1139
Isopentane	0.8208	19.699	3.5951
n-Pentane	1.0926	26.223	4.7856
n-Hexane	0.2949	7.076	1.2915
Other Hexanes	0.8667	20.800	3.7960
Heptanes	0.3340	8.017	1.4631
2,2,4-Trimethylpentane	0.0440	1.056	0.1926

Benzene	5.3199	127.678	23.3012
Toluene	7.1353	171.247	31.2527
Ethylbenzene	0.3893	9.344	1.7053
Xylenes	3.2447	77.873	14.2119
C8+ Heavies	0.4532	10.877	1.9850
Total Emissions	31.4009	753.621	137.5359
Total Hydrocarbon Emissions	31.4009	753.621	137.5359
Total VOC Emissions	27.0431	649.034	118.4487
Total HAP Emissions	16.4281	394.275	71.9552
Total BTEX Emissions	16.0893	386.143	70.4711

FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.6632	15.917	2.9049
Ethane	0.5451	13.083	2.3876
Propane	0.2668	6.403	1.1686
Isobutane	0.0515	1.236	0.2256
n-Butane	0.1139	2.733	0.4988
Isopentane	0.0297	0.714	0.1303
n-Pentane	0.0318	0.764	0.1394
n-Hexane	0.0048	0.115	0.0210
Other Hexanes	0.0185	0.445	0.0811
Heptanes	0.0027	0.064	0.0116
2,2,4-Trimethylpentane	0.0007	0.017	0.0030
Benzene	0.0031	0.076	0.0138
Toluene	0.0027	0.066	0.0120
Ethylbenzene	0.0001	0.002	0.0004
Xylenes	0.0005	0.012	0.0022
C8+ Heavies	0.0004	0.009	0.0016
Total Emissions	1.7356	41.654	7.6019
Total Hydrocarbon Emissions	1.7356	41.654	7.6019
Total VOC Emissions	0.5273	12.655	2.3094
Total HAP Emissions	0.0120	0.287	0.0524
Total BTEX Emissions	0.0065	0.155	0.0283

FLASH TANK OFF GAS

Component	lbs/hr	lbs/day	tons/yr
Methane	33.1604	795.849	145.2425
Ethane	27.2554	654.130	119.3786
Propane	13.3402	320.164	58.4299
Isobutane	2.5752	61.804	11.2793
n-Butane	5.6943	136.664	24.9411
Isopentane	1.4872	35.693	6.5139
n-Pentane	1.5918	38.203	6.9721
n-Hexane	0.2395	5.749	1.0491
Other Hexanes	0.9263	22.230	4.0571
Heptanes	0.1330	3.192	0.5825
2,2,4-Trimethylpentane	0.0346	0.831	0.1517
Benzene	0.1574	3.777	0.6894
Toluene	0.1367	3.280	0.5987
Ethylbenzene	0.0043	0.104	0.0190
Xylenes	0.0252	0.605	0.1105

C8+ Heavies	0.0179	0.429	0.0783
Total Emissions	86.7794	2082.705	380.0936
Total Hydrocarbon Emissions	86.7794	2082.705	380.0936
Total VOC Emissions	26.3636	632.726	115.4725
Total HAP Emissions	0.5978	14.347	2.6183
Total BTEX Emissions	0.3236	7.767	1.4175

COMBINED REGENERATOR VENT/FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.6857	16.458	3.0035
Ethane	0.6097	14.634	2.6707
Propane	0.3332	7.997	1.4595
Isobutane	0.0707	1.697	0.3098
n-Butane	0.1692	4.061	0.7411
Isopentane	0.0462	1.108	0.2022
n-Pentane	0.0537	1.289	0.2352
n-Hexane	0.0107	0.257	0.0468
Other Hexanes	0.0359	0.861	0.1571
Heptanes	0.0093	0.224	0.0409
2,2,4-Trimethylpentane	0.0016	0.038	0.0069
Benzene	0.1095	2.629	0.4798
Toluene	0.1454	3.491	0.6370
Ethylbenzene	0.0079	0.189	0.0345
Xylenes	0.0654	1.570	0.2864
C8+ Heavies	0.0094	0.226	0.0413
Total Emissions	2.3636	56.727	10.3526
Total Hydrocarbon Emissions	2.3636	56.727	10.3526
Total VOC Emissions	1.0681	25.635	4.6784
Total HAP Emissions	0.3405	8.172	1.4915
Total BTEX Emissions	0.3283	7.878	1.4378

COMBINED REGENERATOR VENT/FLASH GAS EMISSION CONTROL REPORT:

Component	Uncontrolled tons/yr	Controlled tons/yr	% Reduction
Methane	150.1748	3.0035	98.00
Ethane	133.5336	2.6707	98.00
Propane	72.9761	1.4595	98.00
Isobutane	15.4879	0.3098	98.00
n-Butane	37.0550	0.7411	98.00
Isopentane	10.1091	0.2022	98.00
n-Pentane	11.7577	0.2352	98.00
n-Hexane	2.3406	0.0468	98.00
Other Hexanes	7.8531	0.1571	98.00
Heptanes	2.0456	0.0409	98.00
2,2,4-Trimethylpentane	0.3443	0.0069	98.00
Benzene	23.9905	0.4798	98.00
Toluene	31.8513	0.6370	98.00
Ethylbenzene	1.7243	0.0345	98.00
Xylenes	14.3224	0.2864	98.00

C8+ Heavies	2.0633	0.0413	98.00
Total Emissions	517.6296	10.3526	98.00
Total Hydrocarbon Emissions	517.6296	10.3526	98.00
Total VOC Emissions	233.9212	4.6784	98.00
Total HAP Emissions	74.5734	1.4915	98.00
Total BTEX Emissions	71.8885	1.4378	98.00

EQUIPMENT REPORTS:

COMBUSTION DEVICE

Ambient Temperature:	70.00 deg. F
Excess Oxygen:	10.00 %
Combustion Efficiency:	98.00 %
Supplemental Fuel Requirement:	1.86e-001 MM BTU/hr

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

ABSORBER

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

Calculated Absorber Stages:	1.25
Calculated Dry Gas Dew Point:	1.07 lbs. H2O/MMSCF
Temperature:	75.0 deg. F
Pressure:	1200.0 psig
Dry Gas Flow Rate:	152.0000 MMSCF/day
Glycol Losses with Dry Gas:	2.7377 lb/hr
Wet Gas Water Content:	Saturated
Calculated Wet Gas Water Content:	24.78 lbs. H2O/MMSCF
Calculated Lean Glycol Recirc. Ratio:	7.51 gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol

Water	4.30%	95.70%
Carbon Dioxide	99.77%	0.23%
Nitrogen	99.98%	0.02%
Methane	99.98%	0.02%
Ethane	99.96%	0.04%
Propane	99.94%	0.06%
Isobutane	99.93%	0.07%
n-Butane	99.91%	0.09%
Isopentane	99.92%	0.08%
n-Pentane	99.89%	0.11%
n-Hexane	99.84%	0.16%
Other Hexanes	99.88%	0.12%
Heptanes	99.75%	0.25%
2,2,4-Trimethylpentane	99.90%	0.10%
Benzene	92.08%	7.92%
Toluene	89.72%	10.28%
Ethylbenzene	88.89%	11.11%
Xylenes	84.62%	15.38%
C8+ Heavies	99.78%	0.22%

FLASH TANK

Flash Control: Combustion device
Flash Control Efficiency: 98.00 %
Flash Temperature: 135.0 deg. F
Flash Pressure: 35.0 psig

Component	Left in Glycol	Removed in Flash Gas
Water	99.93%	0.07%
Carbon Dioxide	27.65%	72.35%
Nitrogen	3.20%	96.80%
Methane	3.28%	96.72%
Ethane	10.60%	89.40%
Propane	19.93%	80.07%
Isobutane	27.17%	72.83%
n-Butane	32.69%	67.31%
Isopentane	35.89%	64.11%
n-Pentane	41.00%	59.00%
n-Hexane	55.40%	44.60%
Other Hexanes	48.85%	51.15%
Heptanes	71.67%	28.33%
2,2,4-Trimethylpentane	56.61%	43.39%
Benzene	97.27%	2.73%
Toluene	98.27%	1.73%
Ethylbenzene	99.02%	0.98%
Xylenes	99.33%	0.67%
C8+ Heavies	96.66%	3.34%

REGENERATOR

No Stripping Gas used in regenerator.

Component	Remaining in Glycol	Distilled Overhead

Water	51.41%	48.59%
Carbon Dioxide	0.00%	100.00%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%
Propane	0.00%	100.00%
Isobutane	0.00%	100.00%
n-Butane	0.00%	100.00%
Isopentane	1.39%	98.61%
n-Pentane	1.22%	98.78%
n-Hexane	0.90%	99.10%
Other Hexanes	2.05%	97.95%
Heptanes	0.70%	99.30%
2,2,4-Trimethylpentane	2.65%	97.35%
Benzene	5.14%	94.86%
Toluene	8.04%	91.96%
Ethylbenzene	10.51%	89.49%
Xylenes	13.02%	86.98%
C8+ Heavies	12.43%	87.57%

STREAM REPORTS:

WET GAS STREAM

Temperature: 75.00 deg. F
Pressure: 1214.70 psia
Flow Rate: 6.34e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	5.22e-002	1.57e+002
Carbon Dioxide	1.53e-001	1.13e+003
Nitrogen	5.22e-001	2.44e+003
Methane	7.95e+001	2.13e+005
Ethane	1.38e+001	6.94e+004
Propane	3.90e+000	2.87e+004
Isobutane	5.02e-001	4.87e+003
n-Butane	9.19e-001	8.92e+003
Isopentane	2.30e-001	2.77e+003
n-Pentane	2.06e-001	2.48e+003
n-Hexane	2.39e-002	3.44e+002
Other Hexanes	1.03e-001	1.48e+003
Heptanes	1.11e-002	1.86e+002
2,2,4-Trimethylpentane	4.30e-003	8.20e+001
Benzene	5.30e-003	6.91e+001
Toluene	4.60e-003	7.08e+001
Ethylbenzene	2.00e-004	3.55e+000
Xylenes	1.20e-003	2.13e+001
C8+ Heavies	7.70e-003	2.19e+002
Total Components	100.00	3.36e+005

DRY GAS STREAM

Temperature: 75.00 deg. F

Pressure: 1214.70 psia
Flow Rate: 6.33e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	2.25e-003	6.76e+000
Carbon Dioxide	1.53e-001	1.13e+003
Nitrogen	5.23e-001	2.44e+003
Methane	7.96e+001	2.13e+005
Ethane	1.38e+001	6.93e+004
Propane	3.90e+000	2.87e+004
Isobutane	5.02e-001	4.87e+003
n-Butane	9.19e-001	8.92e+003
Isopentane	2.30e-001	2.77e+003
n-Pentane	2.05e-001	2.47e+003
n-Hexane	2.39e-002	3.43e+002
Other Hexanes	1.03e-001	1.48e+003
Heptanes	1.11e-002	1.85e+002
2,2,4-Trimethylpentane	4.30e-003	8.19e+001
Benzene	4.88e-003	6.36e+001
Toluene	4.13e-003	6.35e+001
Ethylbenzene	1.78e-004	3.15e+000
Xylenes	1.02e-003	1.80e+001
C8+ Heavies	7.69e-003	2.19e+002
Total Components	100.00	3.36e+005

LEAN GLYCOL STREAM

Temperature: 75.00 deg. F
Flow Rate: 1.88e+001 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.85e+001	1.04e+004
Water	1.50e+000	1.59e+002
Carbon Dioxide	2.49e-012	2.64e-010
Nitrogen	4.72e-013	4.99e-011
Methane	1.09e-017	1.15e-015
Ethane	1.36e-007	1.44e-005
Propane	6.41e-009	6.78e-007
Isobutane	1.00e-009	1.06e-007
n-Butane	1.98e-009	2.10e-007
Isopentane	1.10e-004	1.16e-002
n-Pentane	1.27e-004	1.35e-002
n-Hexane	2.54e-005	2.69e-003
Other Hexanes	1.71e-004	1.81e-002
Heptanes	2.22e-005	2.35e-003
2,2,4-Trimethylpentane	1.13e-005	1.20e-003
Benzene	2.72e-003	2.88e-001
Toluene	5.90e-003	6.24e-001
Ethylbenzene	4.32e-004	4.58e-002
Xylenes	4.59e-003	4.86e-001
C8+ Heavies	6.08e-004	6.43e-002
Total Components	100.00	1.06e+004

RICH GLYCOL STREAM

Temperature: 75.00 deg. F
Pressure: 1214.70 psia
Flow Rate: 1.94e+001 gpm
NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.60e+001	1.04e+004
Water	2.85e+000	3.09e+002
Carbon Dioxide	2.43e-002	2.64e+000
Nitrogen	4.60e-003	4.99e-001
Methane	3.16e-001	3.43e+001
Ethane	2.81e-001	3.05e+001
Propane	1.54e-001	1.67e+001
Isobutane	3.26e-002	3.54e+000
n-Butane	7.80e-002	8.46e+000
Isopentane	2.14e-002	2.32e+000
n-Pentane	2.49e-002	2.70e+000
n-Hexane	4.95e-003	5.37e-001
Other Hexanes	1.67e-002	1.81e+000
Heptanes	4.32e-003	4.69e-001
2,2,4-Trimethylpentane	7.35e-004	7.98e-002
Benzene	5.31e-002	5.77e+000
Toluene	7.28e-002	7.90e+000
Ethylbenzene	4.05e-003	4.39e-001
Xylenes	3.46e-002	3.76e+000
C8+ Heavies	4.93e-003	5.35e-001
Total Components	100.00	1.09e+004

FLASH TANK OFF GAS STREAM

Temperature: 135.00 deg. F
Pressure: 49.70 psia
Flow Rate: 1.35e+003 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	3.52e-001	2.26e-001
Carbon Dioxide	1.22e+000	1.91e+000
Nitrogen	4.86e-001	4.83e-001
Methane	5.82e+001	3.32e+001
Ethane	2.55e+001	2.73e+001
Propane	8.51e+000	1.33e+001
Isobutane	1.25e+000	2.58e+000
n-Butane	2.76e+000	5.69e+000
Isopentane	5.80e-001	1.49e+000
n-Pentane	6.21e-001	1.59e+000
n-Hexane	7.82e-002	2.40e-001
Other Hexanes	3.02e-001	9.26e-001
Heptanes	3.73e-002	1.33e-001
2,2,4-Trimethylpentane	8.53e-003	3.46e-002
Benzene	5.67e-002	1.57e-001
Toluene	4.17e-002	1.37e-001
Ethylbenzene	1.15e-003	4.33e-003
Xylenes	6.69e-003	2.52e-002
C8+ Heavies	2.95e-003	1.79e-002
Total Components	100.00	8.94e+001

FLASH TANK GLYCOL STREAM

Temperature: 135.00 deg. F
Flow Rate: 1.92e+001 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.68e+001	1.04e+004
Water	2.87e+000	3.09e+002
Carbon Dioxide	6.78e-003	7.30e-001
Nitrogen	1.48e-004	1.60e-002
Methane	1.05e-002	1.13e+000
Ethane	3.00e-002	3.23e+000
Propane	3.09e-002	3.32e+000
Isobutane	8.93e-003	9.61e-001
n-Butane	2.57e-002	2.77e+000
Isopentane	7.73e-003	8.32e-001
n-Pentane	1.03e-002	1.11e+000
n-Hexane	2.76e-003	2.98e-001
Other Hexanes	8.22e-003	8.85e-001
Heptanes	3.13e-003	3.36e-001
2,2,4-Trimethylpentane	4.20e-004	4.52e-002
Benzene	5.21e-002	5.61e+000
Toluene	7.21e-002	7.76e+000
Ethylbenzene	4.04e-003	4.35e-001
Xylenes	3.47e-002	3.73e+000
C8+ Heavies	4.81e-003	5.18e-001
Total Components	100.00	1.08e+004

FLASH GAS EMISSIONS

Flow Rate: 5.57e+003 scfh
Control Method: Combustion Device
Control Efficiency: 98.00

Component	Conc. (vol%)	Loading (lb/hr)
Water	6.12e+001	1.62e+002
Carbon Dioxide	3.83e+001	2.47e+002
Nitrogen	1.17e-001	4.83e-001
Methane	2.81e-001	6.63e-001
Ethane	1.23e-001	5.45e-001
Propane	4.12e-002	2.67e-001
Isobutane	6.03e-003	5.15e-002
n-Butane	1.33e-002	1.14e-001
Isopentane	2.81e-003	2.97e-002
n-Pentane	3.00e-003	3.18e-002
n-Hexane	3.78e-004	4.79e-003
Other Hexanes	1.46e-003	1.85e-002
Heptanes	1.81e-004	2.66e-003
2,2,4-Trimethylpentane	4.13e-005	6.93e-004
Benzene	2.74e-004	3.15e-003
Toluene	2.02e-004	2.73e-003
Ethylbenzene	5.55e-006	8.66e-005
Xylenes	3.24e-005	5.05e-004
C8+ Heavies	1.43e-005	3.58e-004

Total Components	100.00	4.11e+002

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
Pressure: 14.70 psia
Flow Rate: 3.37e+003 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	9.37e+001	1.50e+002
Carbon Dioxide	1.86e-001	7.30e-001
Nitrogen	6.42e-003	1.60e-002
Methane	7.89e-001	1.13e+000
Ethane	1.21e+000	3.23e+000
Propane	8.47e-001	3.32e+000
Isobutane	1.86e-001	9.61e-001
n-Butane	5.35e-001	2.77e+000
Isopentane	1.28e-001	8.21e-001
n-Pentane	1.70e-001	1.09e+000
n-Hexane	3.85e-002	2.95e-001
Other Hexanes	1.13e-001	8.67e-001
Heptanes	3.75e-002	3.34e-001
2,2,4-Trimethylpentane	4.33e-003	4.40e-002
Benzene	7.66e-001	5.32e+000
Toluene	8.71e-001	7.14e+000
Ethylbenzene	4.12e-002	3.89e-001
Xylenes	3.44e-001	3.24e+000
C8+ Heavies	2.99e-002	4.53e-001
Total Components	100.00	1.82e+002

COMBUSTION DEVICE OFF GAS STREAM

Temperature: 1000.00 deg. F
Pressure: 14.70 psia
Flow Rate: 4.12e+000 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Methane	1.29e+001	2.25e-002
Ethane	1.98e+001	6.46e-002
Propane	1.39e+001	6.64e-002
Isobutane	3.04e+000	1.92e-002
n-Butane	8.76e+000	5.53e-002
Isopentane	2.09e+000	1.64e-002
n-Pentane	2.79e+000	2.19e-002
n-Hexane	6.30e-001	5.90e-003
Other Hexanes	1.85e+000	1.73e-002
Heptanes	6.14e-001	6.68e-003
2,2,4-Trimethylpentane	7.09e-002	8.80e-004
Benzene	1.25e+001	1.06e-001
Toluene	1.43e+001	1.43e-001
Ethylbenzene	6.75e-001	7.79e-003
Xylenes	5.63e+000	6.49e-002
C8+ Heavies	4.90e-001	9.06e-003

Total Components	100.00	6.28e-001

G3616

GAS COMPRESSION APPLICATION

GAS ENGINE SITE SPECIFIC TECHNICAL DATA
Janus

CATERPILLAR®

ENGINE SPEED (rpm):	1000	RATING STRATEGY:	STANDARD
COMPRESSION RATIO:	7.6	RATING LEVEL:	CONTINUOUS
AFTERCOOLER TYPE:	SCAC	FUEL SYSTEM:	GAV
AFTERCOOLER - STAGE 1 INLET (°F):	174		WITH AIR FUEL RATIO CONTROL
JACKET WATER OUTLET (°F):	190	**SITE CONDITIONS:**	
ASPIRATION:	TA	FUEL:	Gas Analysis
COOLING SYSTEM:	JW+1AC, OC+2AC	FUEL PRESSURE RANGE(psig):	58.0-70.3
CONTROL SYSTEM:	ADEM4	FUEL METHANE NUMBER:	58.5
EXHAUST MANIFOLD:	DRY	FUEL LHV (Btu/scf):	1106
COMBUSTION:	LOW EMISSION	ALTITUDE(ft):	1205
NOx EMISSION LEVEL (g/bhp-hr NOx):	0.5	MAXIMUM INLET AIR TEMPERATURE(°F):	100
SET POINT TIMING:	17	STANDARD RATED POWER:	5350 bhp@1000rpm

				MAXIMUM RATING	SITE RATING AT MAXIMUM INLET AIR TEMPERATURE		
RATING		**NOTES**	**LOAD**	**100%**	**100%**	**75%**	**50%**
ENGINE POWER	(WITHOUT FAN)	(1)	bhp	5350	5004	3753	2502
INLET AIR TEMPERATURE			°F	61	100	100	100
AFTERCOOLER - STAGE 2 INLET (°F)		(2)	°F	90	129	129	129
ENGINE DATA							
FUEL CONSUMPTION (LHV)		(3)	Btu/bhp-hr	6649	6688	6875	7346
FUEL CONSUMPTION (HHV)		(3)	Btu/bhp-hr	7338	7382	7588	8107
AIR FLOW (@inlet air temp, 14.7 psia)	(WET)	(4)(5)	ft3/min	12300	12572	9479	6485
AIR FLOW	(WET)	(4)(5)	lb/hr	56238	53453	40303	27575
FUEL FLOW (60°F, 14.7 psia)			scfm	536	504	389	277
INLET MANIFOLD PRESSURE		(6)	in Hg(abs)	104.7	101.4	76.1	53.5
EXHAUST TEMPERATURE - ENGINE OUTLET		(7)	°F	812	831	890	957
EXHAUST GAS FLOW (@engine outlet temp, 14.5 psia)	(WET)	(8)(5)	ft3/min	31980	30834	24342	17517
EXHAUST GAS MASS FLOW	(WET)	(8)(5)	lb/hr	57938	55053	41536	28454
EMISSIONS DATA - ENGINE OUT							
NOx (as NO2)		(9)(10)	g/bhp-hr	0.50	0.50	0.50	0.50
CO		(9)(10)	g/bhp-hr	2.47	2.47	2.47	2.47
THC (mol. wt. of 15.84)		(9)(10)	g/bhp-hr	3.33	3.55	3.86	4.04
NMHC (mol. wt. of 15.84)		(9)(10)	g/bhp-hr	1.23	1.31	1.42	1.49
NMNEHC (VOCs) (mol. wt. of 15.84)		(9)(10)(11)	g/bhp-hr	0.55	0.59	0.64	0.67
HCHO (Formaldehyde)		(9)(10)	g/bhp-hr	0.20	0.20	0.22	0.24
CO2		(9)(10)	g/bhp-hr	434	436	449	478
EXHAUST OXYGEN		(9)(12)	% DRY	10.7	11.0	10.7	10.3
HEAT REJECTION							
HEAT REJ. TO JACKET WATER (JW)		(13)	Btu/min	53513	53105	42942	36257
HEAT REJ. TO ATMOSPHERE		(13)	Btu/min	17853	17700	16186	14721
HEAT REJ. TO LUBE OIL (OC)		(13)	Btu/min	32563	30635	27055	23552
HEAT REJ. TO A/C - STAGE 1 (1AC)		(13)(14)	Btu/min	46341	50313	25135	6019
HEAT REJ. TO A/C - STAGE 2 (2AC)		(13)(14)	Btu/min	19487	11640	7974	4850
COOLING SYSTEM SIZING CRITERIA							
TOTAL JACKET WATER CIRCUIT (JW+1AC)		(14)(15)	Btu/min	111244			
TOTAL STAGE 2 AFTERCOOLER CIRCUIT (OC+2AC)		(14)(15)	Btu/min	59536			

A cooling system safety factor of 0% has been added to the cooling system sizing criteria.

CONDITIONS AND DEFINITIONS

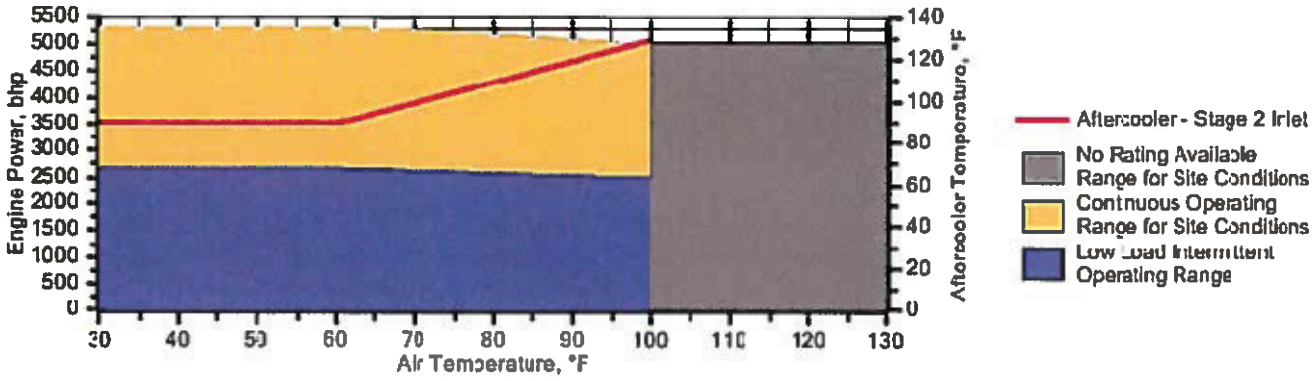
Engine rating obtained and presented in accordance with ISO 3046/1, adjusted for fuel, site altitude and site inlet air temperature. 100% rating at maximum inlet air temperature is the maximum engine capability for the specified fuel at site altitude and maximum site inlet air temperature. Maximum rating is the maximum capability at the specified aftercooler inlet temperature for the specified fuel at site altitude and reduced inlet air temperature. Lowest load point is the lowest continuous duty operating load allowed. No overload permitted at rating shown.

For notes information consult page three.

PREPARED BY: Ryan Hoffman, eqt
Data generated by Gas Engine Rating Pro Version 5.03.00
Ref. Data Set EM0457-03-001, Printed 16Jun2015

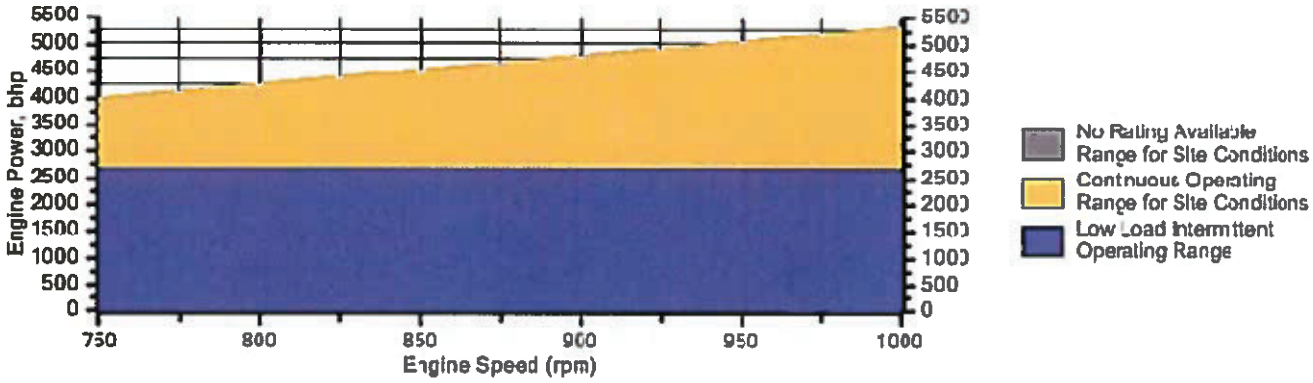
Engine Power vs. Inlet Air Temperature

Data represents temperature sweep at 1205 ft and 1000 rpm



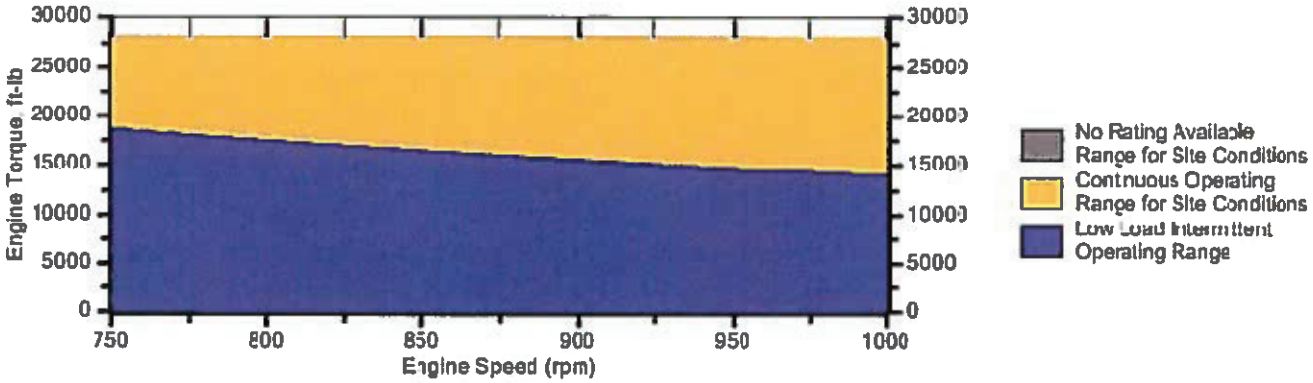
Engine Power vs. Engine Speed

Data represents speed sweep at 1205 ft and 100 °F



Engine Torque vs. Engine Speed

Data represents speed sweep at 1205 ft and 100 °F



Note: At site conditions of 1205 ft and 100°F inlet air temp., constant torque can be maintained down to 750 rpm. The minimum speed for loading at these conditions is 750 rpm.

NOTES

1. Engine rating is with two engine driven water pumps. Tolerance is ± 3% of full load.

2. Aftercooler temperature is based on site specified cooling system ambient capability. Refer to the table below.

Site Ambient Capability	
AC Temp.	Ambient Cap.
90°F	60°F
110°F	80°F
130°F	100°F

3. Fuel consumption tolerance is ± 2.5% of full load data.

4. Air flow value is on a 'wet' basis. Flow is a nominal value with a tolerance of ± 5 %.

5. Inlet and Exhaust Restrictions must not exceed A&I limits based on full load flow rates from the standard technical data sheet.

6. Inlet manifold pressure is a nominal value with a tolerance of ± 5 %.

7. Exhaust temperature is a nominal value with a tolerance of (+)63°F, (-)54°F.

8. Exhaust flow value is on a "wet" basis. Flow is a nominal value with a tolerance of ± 6 %.

9. Emissions data is at engine exhaust flange prior to any after treatment.

10. Emission values are based on engine operating at steady state conditions. Fuel methane number cannot vary more than ± 3. Values listed are higher than nominal levels to allow for instrumentation, measurement, and engine-to-engine variations. They indicate "Not to Exceed" values. THC, NMHC, and NMNEHC do not include aldehydes. An oxidation catalyst may be required to meet Federal, State or local CO or HC requirements.

11. VOCs - Volatile organic compounds as defined in US EPA 40 CFR 60, subpart JJJJ

12. Exhaust Oxygen level is the result of adjusting the engine to operate at the specified NOx level. Tolerance is ± 0.5.

13. Heat rejection values are nominal. Tolerances, based on treated water, are ± 10% for jacket water circuit, ± 50% for radiation, ± 20% for lube oil circuit, and ± 5% for aftercooler circuit.

14. Aftercooler heat rejection includes an aftercooler heat rejection factor for the site elevation and inlet air temperature specified. Aftercooler heat rejection values at part load are for reference only. Do not use part load data for heat exchanger sizing.

15. Cooling system sizing criteria are maximum circuit heat rejection for the site, with applied tolerances.

Constituent	Abbrev	Mole %	Norm
Water Vapor	H2O	0.0000	0.0000
Methane	CH4	80.6440	80.6440
Ethane	C2H6	12.8910	12.8910
Propane	C3H8	3.5750	3.5750
Isobutane	iso-C4H1O	0.4550	0.4550
Norbutane	nor-C4H1O	0.8340	0.8340
Isopentane	iso-C5H12	0.2300	0.2300
Norpentane	nor-C5H12	0.2140	0.2140
Hexane	C6H14	0.5010	0.5010
Heptane	C7H16	0.0000	0.0000
Nitrogen	N2	0.4660	0.4660
Carbon Dioxide	CO2	0.1900	0.1900
Hydrogen Sulfide	H2S	0.0000	0.0000
Carbon Monoxide	CO	0.0000	0.0000
Hydrogen	H2	0.0000	0.0000
Oxygen	O2	0.0000	0.0000
Helium	HE	0.0000	0.0000
Neopentane	neo-C5H12	0.0000	0.0000
Octane	C8H18	0.0000	0.0000
Nonane	C9H20	0.0000	0.0000
Ethylene	C2H4	0.0000	0.0000
Propylene	C3H6	0.0000	0.0000
TOTAL (Volume %)		100.0000	100.0000

Fuel Makeup:	Gas Analysis
Unit of Measure:	English
Calculated Fuel Properties	
Caterpillar Methane Number:	58.5
Lower Heating Value (Btu/scf):	1106
Higher Heating Value (Btu/scf):	1220
WOBBE Index (Btu/scf):	1327
THC: Free Inert Ratio:	151.44
Total % Inerts (% N2, CO2, He):	0.66%
RPC (%) (To 905 Btu/scf Fuel):	100%
Compressibility Factor:	0.997
Stoich A/F Ratio (Vol/Vol):	11.48
Stoich A/F Ratio (Mass/Mass):	16.54
Specific Gravity (Relative to Air):	0.694
Specific Heat Constant (K):	1.286

CONDITIONS AND DEFINITIONS

Caterpillar Methane Number represents the knock resistance of a gaseous fuel. It should be used with the Caterpillar Fuel Usage Guide for the engine and rating to determine the rating for the fuel specified. A Fuel Usage Guide for each rating is included on page 2 of its standard technical data sheet.

RPC always applies to naturally aspirated (NA) engines, and turbocharged (TA or LE) engines only when they are derated for altitude and ambient site conditions.

Project specific technical data sheets generated by the Caterpillar Gas Engine Rating Pro program take the Caterpillar Methane Number and RPC into account when generating a site rating.

Fuel properties for Btu/scf calculations are at 60F and 14.696 psia.

Caterpillar shall have no liability in law or equity, for damages, consequently or otherwise, arising from use of program and related material or any part thereof.

FUEL LIQUIDS

Field gases, well head gases, and associated gases typically contain liquid water and heavy hydrocarbons entrained in the gas. To prevent detonation and severe damage to the engine, hydrocarbon liquids must not be allowed to enter the engine fuel system. To remove liquids, a liquid separator and coalescing filter are recommended, with an automatic drain and collection tank to prevent contamination of the ground in accordance with local codes and standards.

To avoid water condensation in the engine or fuel lines, limit the relative humidity of water in the fuel to 80% at the minimum fuel operating temperature.

PREPARED BY: Ryan Hoffman, eqt
Data generated by Gas Engine Rating Pro Version 5.03.00
Ref. Data Set EM0457-03-001, Printed 16Jun2015

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Prepared For:
Mike Robinson
ENERFLEX ENERGY SERVICES INC

QUOTE: QUO-15753-M1M7

INFORMATION PROVIDED BY CATERPILLAR

Engine:	G3616
Horsepower:	5000
RPM:	1000
Compression Ratio:	9.0
Exhaust Flow Rate:	30823 CFM
Exhaust Temperature:	831 °F
Reference:	DM8608-01
Fuel:	Natural Gas
Annual Operating Hours:	8760

Uncontrolled Emissions

	g/bhp-hr	Lb/Hr	Tons/Year
NOx:	0.50	5.51	24.14
CO:	2.47	27.23	119.25
THC:	3.55	39.13	171.40
NMHC	1.31	14.44	63.25
NMNEHC:	0.59	6.50	28.49
HCHO:	0.20	2.20	9.66
O2:	12.00 %		

POST CATALYST EMISSIONS

	g/bhp-hr
NOx:	Unaffected by Oxidation Catalyst
CO:	<2.00
VOC:	<0.70

CONTROL EQUIPMENT

Catalyst Housing

Model:	EBH-9000-3036F-6C4E-48
Manufacturer:	EMIT Technologies, Inc
Element Size:	Rectangle 48" x 15" x 3.5"
Housing Type:	6 Element Capacity
Catalyst Installation:	Accessible Housing
Construction:	3/16" Carbon Steel
Sample Ports:	9 (0.5" NPT)
Inlet Connections:	30" Flat Face Flange
Outlet Connections:	36" Flat Face Flange
Configuration:	Side In / End Out
Silencer:	Integrated
Silencer Grade:	Hospital
Insertion Loss:	35-40 dBA

Catalyst Element

Model:	RT-4815-Z
Catalyst Type:	Oxidation, Standard Precious Group Metals
Substrate Type:	BRAZED
Manufacturer:	EMIT Technologies, Inc
Element Quantity:	3
Element Size:	Rectangle 48" x 15" x 3.5"

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Technical Reference

Capstone MicroTurbine™ Systems Emissions

Summary

Capstone MicroTurbine™ systems are inherently clean and can meet some of the strictest emissions standards in the world. This technical reference is to provide customers with information that may be requested by local air permitting organizations or to compare air quality impacts of different technologies for a specific project. The preferred units of measure are "output based"; meaning that the quantity of a particular exhaust emission is reported relative to the useable output of the microturbine – typically in pounds per megawatt hour for electrical generating equipment. This technical reference also provides volumetric measurements in parts per million and milligrams per normal cubic meter. A conversion between several common units is also provided.

Maximum Exhaust Emissions at ISO Conditions

Table 1 below summarizes the exhaust emissions at full power and ISO conditions for different Capstone microturbine models. Note that the fuel can have a significant impact on certain emissions. For example landfill and digester gas can be made up of a wide variety of fuel elements and impurities, and typically contains some percentage of carbon dioxide (CO_2). This CO_2 dilutes the fuel, makes complete combustion more difficult, and results in higher carbon monoxide emissions (CO) than for pipeline-quality natural gas.

Table 1. Emission for Different Capstone Microturbine Models in [lb/MWhe]

Model	Fuel	NOx	CO	VOC [5]
C30 NG	Natural Gas [1]	0.64	1.8	0.23
CR30 MBTU	Landfill Gas [2]	0.64	22.0	1.00
CR30 MBTU	Digester Gas [3]	0.64	11.0	1.00
C30 Liquid	Diesel #2 [4]	2.60	0.41	0.23
C65 NG Standard	Natural Gas [1]	0.46	1.25	0.10
C65 NG Low NOx	Natural Gas [1]	0.17	1.30	0.10
C65 NG CARB	Natural Gas [1]	0.17	0.24	0.05
CR65 Landfill	Landfill Gas [2]	0.46	4.0	0.10
CR65 Digester	Digester Gas [3]	0.46	4.0	0.10
C200 NG	Natural Gas [1]	0.40	1.10	0.10
C200 NG CARB	Natural Gas [1]	0.14	0.20	0.04
CR200 Digester	Digester Gas [3]	0.40	3.6	0.10

Notes:

(1) Emissions for standard natural gas at 1,000 BTU/scf (HHV) or 39.4 MJ/m3 (HHV)
(2) Emissions for surrogate gas containing 42% natural gas, 39% CO2, and 19% Nitrogen
(3) Emissions for surrogate gas containing 63% natural gas and 37% CO2
(4) Emissions for Diesel #2 according to ASTM D975-07b
(5) Expressed as Methane

Table 2 provides the same output-based information shown in Table 1, but expressed in grams per horsepower hour (g/hp-hr).

Table 2. Emission for Different Capstone Microturbine Models in [g/hp-hr]

Model	Fuel	NOx	CO	VOC [5]
C30 NG	Natural Gas [1]	0.22	0.60	0.078
CR30 MBTU	Landfill Gas [2]	0.22	7.4	0.340
CR30 MBTU	Digester Gas [3]	0.22	3.7	0.340
C30 Liquid	Diesel #2 [4]	0.90	0.14	0.078
C65 NG Standard	Natural Gas [1]	0.16	0.42	0.034
C65 NG Low NOx	Natural Gas [1]	0.06	0.44	0.034
C65 NG CARB	Natural Gas [1]	0.06	0.08	0.017
CR65 Landfill	Landfill Gas [2]	0.16	1.4	0.034
CR65 Digester	Digester Gas [3]	0.16	1.4	0.034
C200 NG	Natural Gas [1]	0.14	0.37	0.034
C200 NG CARB	Natural Gas [1]	0.05	0.07	0.014
CR200 Digester	Digester Gas [3]	0.14	1.3	0.034

Notes: - same as for Table 1

Emissions may also be reported on a volumetric basis, with the most common unit of measurement being parts per million. This is typically a measurement that is corrected to specific oxygen content in the exhaust and without considering moisture content. The abbreviation for this unit of measurement is "ppmvd" (parts per million by volume, dry) and is corrected to 15% oxygen for electrical generating equipment such as microturbines. The relationship between an output based measurement like pounds per MWh and a volumetric measurement like ppmvd depends on the characteristics of the generating equipment and the molecular weight of the criteria pollutant being measured. Table 3 expresses the emissions in ppmvd at 15% oxygen for the Capstone microturbine models shown in Table 1. Note that raw measurements expressed in ppmv will typically be lower than the corrected values shown in Table 3 because the microturbine exhaust has greater than 15% oxygen.

Another volumetric unit of measurement expresses the mass of a specific criteria pollutant per standard unit of volume. Table 4 expresses the emissions in milligrams per normal cubic meter at 15% oxygen. Normal conditions for this purpose are expresses as one atmosphere of pressure and zero degrees Celsius. Note that both the ppmvd and mg/m3 measurements are for specific oxygen content. A conversion can be made to adjust either unit of measurement to other reference oxygen contents, if required. Use the equation below to convert from one reference oxygen content to another:

$$\text{Emissions at New } O_2 = \frac{(20.9 - \text{New } O_2 \text{ Percent})}{(20.9 - \text{Current } O_2 \text{ Percent})} \text{ X Emissions at Current } O_2$$

For example, to express 9 ppmvd of NOx at 15% oxygen to ppmvd at 3% oxygen:

$$\text{Emissions at 3\% } O_2 = \frac{(20.9 - 3.0)}{(20.9 - 15.0)} \text{ X } 9 = 27 \text{ ppmvd}$$

Table 3. Emission for Different Capstone Microturbine Models in [ppmvd] at 15% O2

Model	Fuel	NOx	CO	VOC
C30 NG	Natural Gas (1)	9	40	9
CR30 MBTU	Landfill Gas (2)	9	500	40
CR30 MBTU	Digester Gas (3)	9	250	40
C30 Liquid	Diesel #2 (4)	35	9	9
C65 NG Standard	Natural Gas (1)	9	40	7
C65 NG Low NOx	Natural Gas (1)	4	40	7
C65 NG CARB	Natural Gas (1)	4	8	3
CR65 Landfill	Landfill Gas (2)	9	130	7
CR65 Digester	Digester Gas (3)	9	130	7
C200 NG	Natural Gas (1)	9	40	7
C200 NG CARB	Natural Gas (1)	4	8	3
CR200 Digester	Digester Gas (3)	9	130	7

Notes: same as Table 1

Table 4. Emission for Different Capstone Microturbine Models in [mg/m3] at 15% O2

Model	Fuel	NOx	CO	VOC (5)
C30 NG	Natural Gas (1)	18	50	6
CR30 MBTU	Landfill Gas (2)	18	620	30
CR30 MBTU	Digester Gas (3)	18	310	30
C30 Liquid	Diesel #2 (4)	72	11	6
C65 NG Standard	Natural Gas (1)	19	50	5
C65 NG Low NOx	Natural Gas (1)	8	50	5
C65 NG CARB	Natural Gas (1)	8	9	2
CR65 Landfill	Landfill Gas (2)	18	160	5
CR65 Digester	Digester Gas (3)	18	160	5
C200 NG	Natural Gas (1)	18	50	5
C200 NG CARB	Natural Gas (1)	8	9	2
CR200 Digester	Digester Gas (3)	18	160	5

Notes: same as Table 1

The emissions stated in Tables 1, 2, 3 and 4 are guaranteed by Capstone for new microturbines during the standard warranty period. They are also the expected emissions for a properly maintained microturbine according to manufacturer's published maintenance schedule for the useful life of the equipment.

Emissions at Full Power but Not at ISO Conditions

The maximum emissions in Tables 1, 2, 3 and 4 are at full power under ISO conditions. These levels are also the expected values at full power operation over the published allowable ambient temperature and elevation ranges.

Emissions at Part Power

Capstone microturbines are designed to maintain combustion stability and low emissions over a wide operating range. Capstone microturbines utilize multiple fuel injectors, which are switched on or off depending on the power output of the turbine. All injectors are typically on when maximum power is demanded, regardless of the ambient temperature or elevation. As the load requirements of the microturbine are decreased, injectors will be switched off to maintain stability and low emissions. However, the emissions relative to the lower power output may increase. This effect differs for each microturbine model.

Emissions Calculations for Permitting

Air Permitting agencies are normally concerned with the maximum amount of a given pollutant being emitted per unit of time (for example pounds per day of NOx). The simplest way to make this calculation is to use the maximum microturbine full electrical power output (expressed in MW) multiplied by the emissions rate in pounds per MWhe times the number of hours per day. For example, the C65 CARB microturbine operating on natural gas would have a NOx emissions rate of:

NOx = .17 X (65/1000) X 24 = .27 pounds per day

This would be representative of operating the equipment full time, 24 hours per day, at full power output of 65 kWe.

As a general rule, if local permitting is required, use the published agency levels as the stated emissions for the permit and make sure that this permitted level is above the calculated values in this technical reference.

Consideration of Useful Thermal Output

Capstone microturbines are often deployed where their clean exhaust can be used to provide heating or cooling, either directly or using hot water or other heat transfer fluids. In this case, the local permitting or standards agencies will usually consider the emissions from traditional heating sources as being displaced by the useful thermal output of the microturbine exhaust energy. This increases the useful output of the microturbine, and decreases the relative emissions of the combined heat and power system. For example, the CARB version C65 ICHP system with integral heat recovery can achieve a total system efficiency of 70% or more, depending on inlet water temperatures and other installation-specific characteristics. The electric efficiency of the CARB version C65 microturbine is 28% at ISO conditions. This means that the total NOx output based emissions, including the captured thermal value, is the electric-only emissions times the ratio of electric efficiency divided by total system efficiency:

NOx = .17 X 28/70 = .068 pounds per MWh (based on total system output)

This is typically much less than the emissions that would result from providing electric power using traditional central power plants, plus the emissions from a local hot water heater or boiler. In fact microturbine emissions are so low compared with traditional hot water heaters that installing a Capstone microturbine with heat recovery can actually decrease the local emissions of NOx and other criteria pollutants, without even considering the elimination of emissions from a remote power plant.

Greenhouse Gas Emissions

Many gasses are considered "greenhouse gasses", and agencies have ranked them based on their global warming potential (GWP) in the atmosphere compared with carbon dioxide (CO_2), as well as their ability to maintain this effect over time. For example, methane is a greenhouse gas with a GWP of 21. Criteria pollutants like NOx and organic compounds like methane are monitored by local air permitting authorities, and are subject to strong emissions controls. Even though some of these criteria pollutants can be more troublesome for global warming than CO_2, they are released in small quantities – especially from Capstone microturbines. So the major contributor of concern is carbon dioxide, or CO_2. Emission of CO_2 depends on two things:

1. Carbon content in the fuel
2. Efficiency of converting fuel to useful energy

It is for these reasons that many local authorities are focused on using clean fuels (for example natural gas compared with diesel fuel), achieving high efficiency using combined heat and power systems, and displacing emissions from traditional power plants using renewable fuels like waste landfill and digester gasses.

Table 5 shows the typical CO_2 emissions due to combustion for different Capstone microturbine models at full power and ISO conditions. The values do not include CO_2 that may already exist in the fuel itself, which is typical for renewable fuels like landfill and digester gas. These values are expressed on an output basis, as is done for criteria pollutants in Table 1. The table shows the pounds per megawatt hour based on electric power output only, as well as considering total useful output in a CHP system with total 70% efficiency (LHV). As for criteria pollutants, the relative quantity of CO_2 released is substantially less when useful thermal output is also considered in the measurement.

Table 5. CO_2 Emission for Capstone Microturbine Models in [lb/MWh]

Model	Fuel	CO_2	
		Electric Only	70% Total CHP
C30 NG	Natural Gas (1)	1,690	625
CR30 MBTU	Landfill Gas (1)	1,690	625
CR30 MBTU	Digester Gas (1)	1,690	625
C30 Liquid	Diesel #2 (2)	2,400	855
C65 NG Standard	Natural Gas (1)	1,520	625
C65 NG Low NOx	Natural Gas (1)	1,570	625
C65 NG CARB	Natural Gas (1)	1,570	625
CR65 Landfill	Landfill Gas (1)	1,520	625
CR65 Digester	Digester Gas (1)	1,520	625
C200 NG	Natural Gas (1)	1,330	625
C200 NG CARB	Natural Gas (1)	1,330	625
CR200 Digester	Digester Gas (1)	1,330	625

Notes:

(1) Emissions due to combustion, assuming natural gas with CO_2 content of 117 lb/MMBTU (HHV)

(2) Emissions due to combustion, assuming diesel fuel with CO_2 content of 160 lb/MMBTU (HHV)

Useful Conversions

The conversions shown in Table 6 can be used to obtain other units of emissions outputs. These are approximate conversions.

Table 6. Useful Unit Conversions

From	Multiply By	To Get
lb/MWh	0.338	g/bhp-hr
g/bhp-hr	2.96	lb/MWh
lb	0.454	kg
kg	2.20	lb
kg	1,000	g
hp (electric)	.746	kW
kW	1.34	hp (electric)
MW	1,000	kW
kW	0.001	MW

Definitions

- ISO conditions are defined as: 15 °C (59 °F), 60% relative humidity, and sea level pressure of 101.3 kPa (14.696 psia).
- HHV: Higher Heating Value
- LHV: Lower Heating Value
- kW_{th}: Kilowatt (thermal)
- kW_e : Kilowatt (electric)
- MWh: Megawatt-hour
- hp-hr: horsepower-hour (sometimes referred to as "electric horsepower-hour")
- Scf: Standard cubic foot (standard references ISO temperature and pressure)
- m3: Normal cubic meter (normal references 0 °C and one atmosphere pressure)

Capstone Contact Information

If questions arise regarding this technical reference, please contact Capstone Turbine Corporation for assistance and information:

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